THE THEORY OF FINANCIAL INTERMEDIATION:

AN ESSAY ON WHAT IT DOES (NOT) EXPLAIN

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and

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THE THEORY OF FINANCIAL INTERMEDIATION

AN ESSAY ON WHAT IT DOES (NOT) EXPLAIN[+]

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Abstract

This essay reflects upon the relationship between the current theory of financial intermediation and real-world practice. Our critical analysis of this theory leads to several building blocks of a new theory of financial intermediation.

Current financial intermediation theory builds on the notion that intermediaries serve to reduce transaction costs and informational asymmetries. As developments in information technology, deregulation, deepening of financial markets, etc. tend to reduce transaction costs and informational asymmetries, financial intermediation theory shall come to the conclusion that intermediation becomes useless. This contrasts with the practitioner's view of financial intermediation as a value-creating economic process. It also conflicts with the continuing and increasing economic importance of financial intermediaries. From this paradox, we conclude that current financial intermediation theory fails to provide a satisfactory understanding of the existence of financial intermediaries.

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We present building blocks for a theory of financial intermediation that aims at understanding and explaining the existence and the behavior of real-life financial intermediaries. When information asymmetries are not the driving force behind intermediation activity and their elimination is not the commercial motive for financial intermediaries, the question arises which paradigm, as an alternative, could better express the essence of the intermediation process. In our opinion, the concept of *value creation* in the context of the value chain might serve that purpose. And, in our opinion, it is *risk* and *risk management* that drives this value creation. The absorption of risk is the central function of both banking and insurance. The risk function bridges a mismatch between the supply of savings and the demand for investments as savers are on average more risk averse than real investors. Risk, that means maturity risk, counterparty risk, market risk (interest rate and stock prices), life expectancy, income expectancy risk etc., is the core business of the financial industry. Financial intermediaries can absorb risk on the scale required by the market because their scale permits a sufficiently diversified portfolio of investments needed to offer the security required by savers and policyholders. Financial intermediaries are not just agents who screen and monitor on behalf of savers. They are active counterparts themselves offering a specific product that cannot be offered by individual investors to savers, namely cover for risk. They use their reputation and their balance sheet and off-balance sheet items, rather than their very limited own funds, to act as such counterparts. As such, they have a crucial function within the modern economy.

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1. Introduction

When a banker starts to study the theory of financial intermediation in order to better understand what he has done during his professional life, he enters a world unknown to him. That world is full of concepts which he did not, or hardly, knew before and full of expressions he never used himself: asymmetric information, adverse selection, monitoring, costly state verification, moral hazard and a couple more of the same kind. He gets the uneasy feeling that a growing divergence has emerged between the micro-economic theory of banking, as it took shape in the last three decades, and the everyday behavior of bankers according to their business motives, expressed in the language they use.

This essay tries to reflect on the merits of the present theory of financial intermediation, on what it does and does not explain from both a practical and a theoretical point of view. The theory is impressive by the multitude of applications in the financial world of the agency theory and the theory of asymmetric information, of adverse selection and moral hazard. As well as by their relevance for important aspects of the financial intermediation process, as is shown in an ever-growing stream of economic studies. But the study of all these theories leaves the practitioner with the impression that they do not provide a satisfactory answer to the basic question; which forces really drive the financial intermediation process? The current theory shows and explains a great variety in the behavior of financial intermediaries in the market in their relation to savers and to investors/entrepreneurs. But as far as the authors of this essay are aware, it does not, or not yet, provide a satisfactory answer to the question of why real-life financial institutions exist, what keeps them alive and what is their essential contribution to (inter)national economic welfare.

We believe that this question cannot be addressed by a further extension of the present theory, by the framework of the agency theory and the theory of asymmetric information. The question goes into the heart of the present theory, into the paradigm on which it is based. This paradigm is the famous classical idea of the perfect market, introduced by Marshall and Walras. Since then, it has been the leading principle, the central point of reference in the theory of competition, the neoclassical growth theory, the portfolio theory and also the leading principle of the present theory of financial intermediation. Financial intermediaries, according to that theory, have a function only because financial markets are not perfect. They exist by the grace of market

imperfections. As long as there are market imperfections, there are intermediaries. As soon as markets are perfect, intermediaries are redundant; they have lost their function because savers and investors dispose of the perfect information needed to find each other directly, immediately and without any impediments, so without costs, and to deal at optimal prices. This is the general equilibrium model à la Arrow-Debreu in which banks cannot exist. Obviously, this contrasts with the huge economic and social importance of financial intermediaries in highly developed modern economies. Empirical observations point at an increasing role for financial intermediaries in economies that experience vastly decreasing information and transaction costs. Our essay goes into this paradox and comes up with an amendment of the existing theory of financial intermediation.

The structure of this paper is as follows. First, we introduce the foundations of the modern literature of financial intermediation theory. From this, we infer the key predictions with respect to the role of the financial intermediary within the economy. In Section 3, we will investigate the *de facto* role of financial intermediaries in modern economies. We discuss views on the theoretical relevance of financial intermediaries for economic growth. We also present some stylized facts and empirical observations about their current position in the economy. The mainstream theory of financial intermediation is briefly presented in Section 4. Of course, we cannot pay sufficient attention to all developments in this area but will focus on the basic rationales for financial intermediaries according to this theory, i.e. information problems, transaction costs, and regulation. Section 5 is a critical assessment of this theory of financial intermediation. An alternative approach of financial intermediation is unfolded in Section 6. In Section 7, we present the main building blocks for an alternative theory of financial intermediation that aims at understanding and explaining the behavior of real-life financial intermediaries. Here, we argue that risk management is the core issue in understanding this behavior. Transforming risk for ultimate savers and lenders and risk management by the financial intermediary itself creates economic value, both for the intermediary and for its client. Accordingly, it is the transformation and management of risk that is the intermediaries' contribution to the economic welfare of the society it operates in. This is – in our opinion – the hidden or neglected economic rationale behind the emergence and the existence and the future of real-life financial intermediaries. In Section 8, we conclude our essay with a proposal for a research agenda for an amended theory of financial intermediation.

2. The Perfect Model

Three pillars are at the basis of the modern theory of finance: optimality, arbitrage, and equilibrium. Optimality refers to the notion that rational investors aim at optimal returns. Arbitrage implies that the same asset has the same price in each single period in the absence of restrictions. Equilibrium means that markets are cleared by price adjustment – through arbitrage – at each moment in time. In the neoclassical model of a perfect market, e.g. the perfect market for capital, or the Arrow-Debreu world, the following criteria usually must be met:

- no individual party on the market can influence prices;
- conditions for borrowing/lending are equal for all parties under equal circumstances;
- there are no discriminatory taxes;
- absence of scale and scope economies;
- all financial titles are homogeneous, divisible and tradable;
- there are no information costs, no transaction costs and no insolvency costs;
- all market parties have *ex ante* and *ex post* immediate and full information on all factors and events relevant for the (future) value of the traded financial instruments.

The Arrow-Debreu world is based on the paradigm of complete markets. In the case of complete markets, present value prices of investment projects are well defined. Savers and investors find each other because they have perfect information on each others preferences at no cost in order to exchange savings against readily available financial instruments. These instruments are constructed and traded costlessly and they fully and simultaneously meet the needs of both savers and investors. Thus, each possible future state of the world is fully covered by a so-called Arrow-Debreu security (state contingent claim). Also important is that the supply of capital instruments is sufficiently diversified as to provide the possibility of full risk diversification and, thanks to complete information, market parties have homogenous expectations and act rationally. In so far as this does not occur naturally, intermediaries are useful to bring savers and investors together and to create instruments that meet their needs. They do so with reimbursement of costs, but costs are by definition an element – or, rather, characteristic – of market imperfection. Therefore, intermediaries are at best tolerated and would be eliminated in a move towards market perfection, with all intermediaries becoming

redundant: the perfect state of disintermediation. This model is the starting point in the present theory of financial intermediation. All deviations from this model which exist in the real world and which cause intermediation by the specialized financial intermediaries, are seen as market imperfections. This wording suggests that intermediation is something which exploits a situation which is not perfect, therefore is undesirable and should or will be temporary. The perfect market is like heaven, it is a teleological perspective, an ideal standard according to which reality is judged. As soon as we are in heaven, intermediaries are superfluous. There is no room for them in that magnificent place.

Are we going to heaven? Are intermediaries increasingly becoming superfluous? One would be inclined to answer both questions in the affirmative when looking to what is actually happening: Increasingly, we have to make do with liberalized, deregulated financial markets. All information on important macroeconomic and monetary data and on the quality and activities of market participants is available in 'real time', on a global scale, twenty-four hours a day, thanks to the breathtaking developments in information and communication technology. Firms issue shares over the Internet and investors can put their order directly in financial markets thanks to the virtual reality. The communication revolution also reduces information costs tremendously. The liberalization and deregulation give, moreover, a strong stimulus towards the securitization of financial instruments, making them transparent, homogeneous, and tradable in the international financial centers in the world. Only taxes are discriminating, inside and between countries. Transaction costs are still there, but they are declining in relative importance thanks to the cost efficiency of ICT and efficiencies of scale. Insolvency and liquidity risks, however, still are an important source of heterogeneity of financial titles. Furthermore, every new crash or crisis invokes calls for additional and more timely information. For example, the Asia crisis resulted in more advanced and verifiable and controllable international financial statistics, whereas the Enron debacle has put the existing business accounting and reporting standards into question. There appears to be an almost unstoppable demand for additional information.

3. Financial Intermediaries in the Economy

So, we are making important progress in our march towards heaven and what happens? Is financial intermediation fading away? One might think so from the forces shaping the current financial environment: deregulation and liberalization, communication, internationalization. But what is actually happening in the real world? Do we really witness the demise of the financial institutions? Are the intermediaries about to vanish from planet Earth? On the contrary, their economic importance is higher than ever and appears to be increasing. This is the case even during the 1990s when markets became almost fully liberalized and when communication on a global scale made a real and almost complete breakthrough. The tendency towards an increasing role of financial intermediation is illustrated in Tables 1 and 2 that give the relative contribution of the financial sector to the two key items of economic wealth and welfare in most nations, i.e. GDP and labor. These tables show that, even in highly developed markets, financial intermediaries tend to play a substantial and increasing role in the current economy. Furthermore, Demirgüç-Kunt and Levine (1999) among others, conclude that claims of deposit money banks and of other financial institutions on the private sector have steadily increased as a percentage of GDP in a large number of countries (circa 150), rich and poor, between the 1960s and 1990s. The pace of increase is not declining in the 1990s. This is reflected in Table 3.

In the 1960s, Raymond Goldsmith (1969) gave stylized facts on financial structure and economic development (see appendix A). He found that in the course of economic development, a country's financial system grows more rapidly than national wealth. It appears that the main determinant of the relative size of a country's financial system is the separation of the functions of saving and investing among different (groups of) economic units. This observation sounds remarkably modern. Since the early 1990s, there has been growing recognition for the positive impact of financial intermediation on the economy. Both theoretical and empirical studies find that a well-developed financial system is beneficial to the economy as a whole. Basically the argument behind this idea is that the efficient allocation of capital within an economy fosters economic growth (see Levine, 1997). Financial intermediation can affect economic growth by acting on the saving rate, on the fraction of saving channeled to investment or on the social marginal productivity of investment. In general, financial development will be positive for economic growth. But some improvements in risk-sharing and in the

credit market for households may decrease the saving rate and, hence, the growth rate (Pagano, 1993).

Table 1: Share of Employment in Financial Services in Total Employment (percentages)

	1970	1980	1985	1990	1995	2000
Canada	2.4	2.7	2.9	3.0	3.2	3.1
France	1.8	2.6	2.9	2.8	2.7	2.8
Germany	2.2	2.8	3.0	3.1	3.3	3.3
Japan	2.4	3.0	3.2	3.3	3.4	3.5
Switzerland	-	-	4.6	4.8	4.8	4.9
United Kingdom	-	3.0	3.5	4.6	4.4	4.4
United States	3.8	4.4	4.7	4.8	4.8	4.8

Source: OECD, National Accounts (various issues)

Table 2: Share of Value-Added in Financial Services in GDP (percentages)

	1970	1980	1985	1990	1995	2000
Canada	2.2	1.8	2.0	2.8	2.9	3.1
France	3.5	4.4	4.8	4.4	4.6	4.8
Germany	3.2	4.5	5.5	4.8	5.8	5.7
Japan	4.3	4.5	5.5	4.8	5.6	5.3
Netherlands	3.1	4.0	5.3	5.6	5.5	5.8
Switzerland	-	-	10.4	10.3	13.1	12.8
United States	4.0	4.8	5.5	6.1	7.2	7.1

Source: OECD, National Accounts (various issues)

Table 3: Financial Intermediary Development over Time for About 150 Countries (percentages)

	1960s	1970s	1980s	1990s
Liquid liabilities/GDP	32	39	47	51
Claims by deposit money banks on private sector/GDP	20	24	32	39

Source: Demirgüç-Kunt and Levine (1999, Figure 2A)

There are different views on how the financial structure affects economic growth exactly (Levine, 2000).

- The bank-based view holds that bank-based systems – particularly at early stages of economic development – foster economic growth to a greater degree than market-based systems.

- The market-based view emphasizes that markets provide key financial services that stimulate innovation and long-run growth.

- The financial services view stresses the role of banks and markets in researching firms, exerting corporate control, creating risk management devices, and mobilizing society's savings for the most productive endeavors in tandem. As such, it does regard banks and markets as complements rather than substitutes as it focuses on the quality of the financial services produced by the entire financial system.

- The legal-based view rejects the analytical validity of the financial structure debate. It argues that the legal system shapes the quality of financial services (for example La Porta et al., 1998). The legal-based view stresses that the component of financial development explained by the legal system critically influences long-run growth. Political factors have been introduced too, in order to explain the relationship between financial and economic development (see Fohlin, 2000; Kroszner and Strahan, 2000; Rajan and Zingales, 2000).

From empirical research of the relationship between economic and financial development, it appears that history and path-dependency weigh very heavy in determining the growth and design of financial institutions and markets. Furthermore, idiosyncratic shocks that surprise institutions and markets over time appear to be quite important. Despite obvious connections among political, legal, economic, and financial institutions and markets, long-term causal relationships often prove to be elusive and appear to depend upon the methodology chosen to study the relationship.[1] But it is important to realize that efficient financial intermediation confers two important benefits: it raises

[1] For example, see Berthelemy and Varoudakis, 1996; Demetriades and Hussein, 1996; Kaplan and Zingales, 1997; Sala-i-Martin, 1997; Fazzari et al., 1988; Levine and Zervos, 1998; Demirgüç-Kunt and Levine, 1999; Filer et al, 1999; Beck and Levine, 2000; Beck et al., 2000; Benhabib and Spiegel, 2000; Demirgüç-Kunt and Maksimovic, 2000; Rousseau and Wachtel, 2000; Arestis et al., 2001; Wachtel, 2001.

the level of investment and savings, and it increases the efficiency in the allocation of financial funds in the economic system.

There is a structural tendency in the composition of national wealth represented in financial titles in many countries, especially the Anglo Saxon, towards the substitution of bank held assets (bank loans etc.) by securitized assets held by the public (equity, bonds) (Ross, 1989). This substitution is often interpreted as a proof of the disintermediation process (e.g. Allen and Santomero, 1997). However, this substitution does not imply that bank loans are not growing any more. To the contrary, they continue to grow, even in the U.S. where the substitution is most visible (see Boyd and Gertler, 1994; Berger et al., 1995). Therefore, this substitution may not be interpreted as a sign of a diminishing role of banking in general. This is because it is the banks that play an essential role in the securitized instruments. They initiate, arrange and underwrite the floating of these instruments. They often maintain a secondary market. They invent a multitude of off-balance instruments derived from securities. They provide for the clearing of the deals. They are the custodians of these constructions. They provide stock lending and they finance market makers in options and futures. Thus, banks are crucial drivers of financial innovation. Furthermore, it is still an unsolved question of how the off-balance instruments should be counted in the statistics of national wealth. Their huge notional amounts do not reflect the constantly varying values for the contracting parties. Banks are moving in an off-balance direction and their purpose is increasingly to develop and provide tradable and non-tradable risk management instruments. And other kinds of financial intermediaries play an increasingly important role in the same direction, both in securitized and non-tradable instruments, both on- and off-balance: insurance companies, pension funds, investments funds, market makers at stock exchanges and derivative markets. These different kinds of financial intermediaries transform risk (concerning future income or accidents or interest rate fluctuations or stock price fluctuations, etc.). Risk transformation and risk management is their job.

Thus, despite the globalization of financial services, driven by deregulation and information technology ,and despite strong price competition, the financial services industry is not declining in importance but it is growing. This seems paradoxical. It points to something important which the modern financial intermediation theory, and the neo-classical market theory on which it is based, do not explain. Might it be the case that it overlooks something crucial? Something that is to be related to information production but that is, so far, not uncovered by the theory of financial intermediation?

4. Modern Theories of Financial Intermediation

In order to give firm ground to our argument and to illustrate the paradox, we will first review the doctrines of the theory of financial intermediation.[2] These are specifications, relevant to the financial services industry, of the agency theory, and the theory of imperfect or asymmetric information. Basically, we may distinguish between three lines of reasoning that aim at explaining the *raison d'être* of financial intermediaries: information problems, transaction costs and regulatory factors.

First, and that used in most studies on financial intermediation, is the informational asymmetries argument. These asymmetries can be of an *ex ante* nature, generating adverse selection, they can be interim, generating moral hazard, and they can be of an *ex post* nature, resulting in auditing or costly state verification and enforcement. The informational asymmetries generate market imperfections, i.e. deviations from the neoclassical framework in Section 2. Many of these imperfections lead to specific forms of transaction costs. Financial intermediaries appear to overcome these costs, at least partially. For example, Diamond and Dybvig (1983) consider banks as coalitions of depositors that provide households with insurance against idiosyncratic shocks that adversely affect their liquidity position. Another approach is based on Leland and Pyle (1977). They interpret financial intermediaries as information sharing coalitions. Diamond (1984) shows that these intermediary coalitions can achieve economies of scale. Diamond (1984) is also of the view that financial intermediaries act as delegated monitors on behalf of ultimate savers. Monitoring will involve increasing returns to scale, which implies that specializing may be attractive. Individual households will delegate the monitoring activity to such a specialist, i.e. to the financial intermediary. The households will put their deposits with the intermediary. They may withdraw the deposits in order to discipline the intermediary in his monitoring function. Furthermore, they will positively value the intermediary's involvement in the ultimate investment (Hart, 1995). Also, there can be assigned a positive incentive effect of short-term debt, and in particular deposits, on bankers (Hart and Moore, 1995). For example, Qi (1998) and Diamond and Rajan (2001) show that deposit finance can create

[2] We have used the widely cited reviews by Allen, 1991; Bhattacharya and Thakor, 1993; Van Damme, 1994; Freixas and Rochet 1997; Allen and Gale, 2000b; Gorton and Winton, 2002, as our main sources in this section.

the right incentives for a bank's management. Illiquid assets of the bank result in a fragile financial structure that is essential for disciplining the bank manager. Note that in the case households that do not turn to intermediated finance but prefer direct finance, there is still a "brokerage" role for financial intermediaries, such as investment banks (see Baron, 1979 and 1982). Here, the reputation effect is also at stake. In financing, both the reputation of the borrower and that of the financier are relevant (Hart and Moore, 1998). Dinç (2001) studies the effects of financial market competition on a bank reputation mechanism, and argues that the incentive for the bank to keep its commitment is derived from its reputation, the number of competing banks and their reputation, and the competition from bond markets. These four aspects clearly interact (see also Boot, Greenbaum and Thakor, 1993).

The "informational asymmetry" studies focus on the bank/borrower and the bank/lender relation in particular. In bank lending one can basically distinguish transactions-based lending (financial statement lending, asset-based lending, credit scoring, etc.) and relationship lending. In the former class information that is relatively easily available at the time of loan origination is used. In the latter class, data gathered over the course of the relationship with the borrower is used (see Lehman and Neuberger, 2001; Kroszner and Strahan, 2001; Berger and Udell, 2002). Central themes in the bank/borrower relation are the screening and monitoring function of banks (*ex ante* information asymmetries), the adverse selection problem (Akerlof, 1970), credit rationing (Stiglitz and Weiss, 1981), the moral hazard problem (Stiglitz and Weiss, 1983) and the *ex post* verification problem (Gale and Hellwig, 1985). Central themes in the bank/lender relation are bank runs, why they occur, how they can be prevented, and their economic consequences (Kindleberger, 1989; Bernanke, 1983; Diamond and Dybvig, 1983). Another avenue in the bank/lender relationship are models for competition between banks for deposits in relation to their lending policy and the probability that they fulfill their obligations (Boot, 2000; Diamond and Rajan, 2001).

Second is the transaction costs approach (examples are Benston and Smith, 1976; Campbell and Kracaw, 1980; Fama, 1980). In contrast to the first, this approach does not contradict the assumption of complete markets. It is based on nonconvexities in transaction technologies. Here, the financial intermediaries act as coalitions of individual lenders or borrowers who exploit economies of scale or scope in the transaction technology. The notion of transaction costs encompasses not only exchange or monetary transaction costs (see Tobin, 1963; Towey, 1974; Fischer, 1983), but also search costs and monitoring and auditing costs (Benston and Smith, 1976). Here, the role of

the financial intermediaries is to transform particular financial claims into other types of claims (so-called qualitative asset transformation). As such, they offer liquidity (Pyle, 1971) and diversification opportunities (Hellwig, 1991). The provision of liquidity is a key function for savers and investors and increasingly for corporate customers, whereas the provision of diversification increasingly is being appreciated in personal and institutional financing. Holmström and Tirole (2001) suggest that this liquidity should play a key role in asset pricing theory. The result is that unique characteristics of bank loans emerge to enhance efficiency between borrower and lender. In loan contract design, it is the urge to be able to efficiently bargain in later (re)negotiations, rather than to fully assess current or expected default risk that structures the ultimate contract (Gorton and Kahn, 2000). With transaction costs, and in contrast to the information asymmetry approach, the reason for the existence of financial intermediaries, namely transaction costs, is exogenous. This is not fully the case in the third approach.

The third approach to explain the raison d'être of financial intermediaries is based on the regulation of money production and of saving in and financing of the economy (see Guttentag and Lindsay, 1968; Fama, 1980; Mankiw, 1986; Merton, 1995b). Regulation affects solvency and liquidity with the financial institution. Diamond and Rajan (2000) show that bank capital affects bank safety, the bank's ability to refinance, and the bank's ability to extract repayment from borrowers or its willingness to liquidate them. The legal-based view especially (see Section 3), sees regulation as a crucial factor that shapes the financial economy (La Porta et al., 1998). Many view financial regulations as something that is completely exogenous to the financial industry. However, the activities of the intermediaries inherently "ask for regulation". This is because they, the banks in particular, by the way and the art of their activities (i.e. qualitative asset transformation), are inherently insolvent and illiquid (for the example of deposit insurance, see Merton and Bodie, 1993). Furthermore, money and its value, the key raw material of the financial services industry, to a large extent is both defined and determined by the nation state, i.e. by regulating authorities *par excellence*. Safety and soundness of the financial system as a whole and the enactment of industrial, financial, and fiscal policies are regarded as the main reasons to regulate the financial industry (see Kareken, 1986; Goodhart, 1987; Boot and Thakor, 1993). Also, the financial history shows a clear interplay between financial institutions and markets and the regulators, be it the present-day specialized financial supervisors or the old-fashioned sovereigns (Kindleberger, 1993). Regulation of financial intermediaries, especially of banks, is costly. There are the direct costs of administration and of employing the supervisors, and

there are the indirect costs of the distortions generated by monetary and prudential supervision. Regulation however, may also generate rents for the regulated financial intermediaries, since it may hamper market entry as well as exit. So, there is a true dynamic relationship between regulation and financial production. It must be noted that, once again, most of the literature in this category focuses on explaining the functioning of the financial intermediary with regulation as an exogenous force. Kane (1977) and Fohlin (2000) attempt to develop theories that explain the existence of the very extensive regulation of financial intermediaries when they go into the dynamics of financial regulation.[3]

Thus, to summarize, according to the modern theory of financial intermediation, financial intermediaries are active because market imperfections prevent savers and investors from trading directly with each other in an optimal way. The most important market imperfections are the informational asymmetries between savers and investors. Financial intermediaries, banks specifically, fill – as agents and as delegated monitors – information gaps between ultimate savers and investors. This is because they have a comparative informational advantage over ultimate savers and investors. They screen and monitor investors on behalf of savers. This is their basic function, which justifies the transaction costs they charge to parties. They also bridge the maturity mismatch between savers and investors and facilitate payments between economic parties by providing a payment, settlement and clearing system. Consequently, they engage in qualitative asset transformation activities. To ensure the sustainability of financial intermediation, safety and soundness regulation has to be put in place. Regulation also provides the basis for the intermediaries to enact in the production of their monetary services.

All studies on the reasons behind financial intermediation focus on the functioning of intermediaries in the intermediation process; they do not examine the existence of the real-world intermediaries as such. It appears that the latter issue is regarded to be dealt with when satisfactory answers on the former are being provided. Market optimization is the main point of reference

[3] The importance of regulation for the existence of the financial intermediary can best be understood if one is prepared to account for the historical and institutional setting of financial intermediation (see Kindleberger, 1993; Merton, 1995b). Interestingly, and illustrating the crucial importance of regulation for financial intermediation, is that there are some authors who suggest that unregulated finance or ‘free banking’ would be highly desirable, as it would be stable and inflation-free. Proponents of this view are, among others, White, 1984; Selgin, 1987; Dowd, 1989.

in case of the functioning of the intermediaries. The studies that appear in most academic journals analyze situations and conditions under which banks or other intermediaries are making markets less imperfect as well as the impediments to their optimal functioning. Perfect markets are the benchmarks and the intermediating parties are analyzed and judged from the viewpoint of their contribution to an optimal allocation of savings, that means to market perfection. Ideally, financial intermediaries should not be there and, being there, they at best alleviate market imperfections as long as the real market parties have no perfect information. On the other hand, they maintain market imperfections as long as they do not completely eliminate informational asymmetries, and even increase market imperfections when their risk aversion creates credit crunches. So, there appears not to be a heroic role for intermediaries at all! But if this is really true, why are these weird creatures still in business, even despite the fierce competition amongst themselves? Are they truly dinosaurs, completely unaware of the extinction they will face in the very near future? This seems highly unlikely. Section 3 showed and argued that the financial intermediaries are alive and kicking. They have a crucial and even increasing role within the real-world economy. They increasingly are linked up in all kinds of economic transactions and processes. Therefore, the next section is a critical assessment of the modern theory of financial intermediation in the face of the real-world behavior and impact of financial institutions and markets.

5. Critical Assessment

Two issues are of key importance. The first is about why we demand banks and other kinds of financial intermediaries. The answer to this question, in our opinion, is risk management rather than informational asymmetries or transaction costs. Economies of scale and scope as well as the delegation of the screening and monitoring function especially apply to dealing with risk itself, rather than only with information. The second issue that matters is why banks and other financial institutions are willing and able to take on the risks that are inevitably involved in their activity. In this respect, it is important to note that financial intermediaries are able to create comparative advantages with respect to information acquisition and processing in relation to their sheer size in relation to the customer whereby they are able to manage risk more efficiently. We suggest Schumpeter's view of entrepreneurs as innovators and Merton's functional perspective of financial intermediaries in tandem are very helpful in this respect.

One should question whether the existence of financial intermediaries and the structural development of financial intermediation can be fully explained by a theoretical framework based on the neo-classical concept of perfect competition. The mainstream theory of financial intermediation, as it has been developed in the past few decades, has – without any doubt – provided numerous valuable insights into the behavior of banks and other intermediaries and their managers in the financial markets under a broad variety of perceived and observed circumstances. For example, the "agency revolution", unleashed by Jensen and Meckling (1976), focussed on principal-agent relation asymmetries. Contracts and conflicts of interest on all levels inside and outside the firm in a world full of information asymmetries became the central theme in the analysis of financial decisions. Important aspects of financial decisions, which previously went unnoticed in the neo-classical theory, could be studied in this approach, and a "black box" of financial decision making was opened. But the power of the agency theory is also her weakness: it mainly explains *ad hoc* situations; new models based on different combinations of assumptions continuously extend it.[4] In nearly all

[4] To this extent, one can draw a striking parallel with the traditional Newtonian view of the natural world. The planetary orbits round the Sun can be explained very well with the Newtonian laws of gravitation and force. Apparent anomalies in the orbital movement of Neptune turned out to be caused by the influence of an hitherto unknown planet (Pluto). Its (predicted) astronomical

financial decisions, information differences and, as a consequence, conflicts of interest, play a role. Focussed on these aspects, the agency theory is capable of investigating nearly every contingency in the interaction of economic agents deviating from what they would have done in a market with perfect foresight and equal incentives for all agents. However, the applications from agency theory have mainly anecdotal value; they are tested in a multitude of specific cases. But the theory fails to evolve into a general and coherent explanation of what is the basic function of financial intermediaries in the markets and the economy as a whole.

Various researchers interested in real world financial phenomena have pointed out that banks in particular do make a difference. They come up with empirical evidence that banks are special. For example, Fama (1985) and James (1987) analyze the incidence of the implicit tax due to reserve requirements. Both conclude that bank loans are special, as bank CDs have not been eliminated by non-bank alternatives that bear no reserve requirements. Mikkelson and Partch (1986) and James (1987) look at the abnormal returns associated with announcements of different types of security offerings and find a positive response to bank loans. Lummer and McConnel (1989) and Best and Zhang (1993) have confirmed these results. Slovin et al. (1993) look into the adverse effect on the borrower in case a borrower's bank fails. They find Continental Illinois borrowers incur significant negative abnormal returns during the bank's impending failure. Gibson (1995) finds similar results when studying the effects of the health of Japanese banks on borrowers. Gilson et al. (1990) find that the likelihood of a successful debt restructuring by a firm in distress is positively related to the extent of that firm's reliance on bank borrowing. James (1996) finds that the higher the proportion of total debt held by the bank, the higher the likelihood the bank debt will be impaired, and so the higher the likelihood that it participates in the restructuring. Hoshi et al. (1991) for Japan and Fohlin (1998) and Gorton and Schmid (1999) for Germany also find that in these countries, banks provide valuable services that cannot be replicated in capital markets. Current intermediation theory treats such observations often as an anomaly. But, in our perspective, it relates rather to the insufficient explanatory power of the current theory of financial intermediation.

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observation was regarded as an even greater victory for Newtonian theory. However, it took Einstein and Bohr to reveal that this theory is only a limit case as it is completely unable to deal with the behavior of microparticles (see Couper and Henbest, 1985; Ferris, 1988; Hawking, 1988).

The basic reason for the insufficient explanatory power of the present intermediation theory has, in our opinion, to be sought in the paradigm of asymmetrical information. Markets are imperfect, according to this paradigm, because the ultimate parties who operate in the markets have insufficient information to conclude a transaction by themselves. Financial intermediaries position themselves as agents ("middlemen") between savers and investors, alleviating information asymmetries against transaction costs to a level where total savings are absorbed by real investments at equilibrium real interest rates.

But in the real world, financial intermediaries do not consider themselves agents who intermediate between savers and investors by procuring information on investors to savers and by selecting and monitoring investors on behalf of savers. That is not their job. They deal in money and in risk, not in information *per se*. Information production predominantly is a means to the end of risk management. In the real world, borrowers, lenders, savers, investors and financial supervisors look at them in the same way, i.e. risk managers instead of information producers. Financial intermediaries deal in financial services, created by themselves, mostly for their own account, via their balance sheet, so for their own risk. They attract savings from the saver and lend it to the investor, adding value by meeting the specific needs of savers and investors at prices that equilibrate the supply and demand of money. This is a creative process, which cannot be characterized by the reduction of information asymmetries. In the intermediation process the financial intermediary *transforms* savings, given the preferences of the saver with respect to liquidity and risk, into investments according to the needs and the risk profile of the investor. It might be clear that for these reasons the views of Bryant (1980) and of Diamond and Dybvig (1983) on the bank as a coalition of depositors, of Akerlof (1970) and Leland and Pyle (1977) on the bank as an information sharing coalition, and of Diamond (1984) on the bank as *delegated* (...) monitor, do not reflect at all the view of bankers on their own role. Nor does it reflect the way in which society experiences their existence. Even with perfect information, the time and risk preferences of savers and investors fail to be matched completely by the price (interest rate) mechanism: there are (too many) missing markets. It is the financial intermediary that somehow has to make do with these missing links. The financial intermediary manages risks in order to allow for the activities of other types of households within the economy.

One would expect that the theory of the firm would pay ample attention to the driving forces behind entrepreneurial activity and could thus explain in more general terms the existence of financial intermediation as an entrepreneurial

activity. However, this is not the focus of that theory. The theory of the firm is preoccupied with the functioning of the corporate enterprise in the context of market structures and competition processes. In the wake of Coase (1937), the corporate enterprise is part of the market structure and can even be considered as an alternative for the market. This view laid the foundation for the transaction cost theory (see Williamson, 1988), for the agency theory (Jensen and Meckling, 1976), and for the theory of asymmetric information (see Stiglitz and Weiss, 1981 and 1983). Essential in the approaches of these theories is that the corporate enterprise is not treated as a "black box", a uniform entity, as was the case in the traditional micro-economic theory of the firm. It is regarded as a coalition of interests operating as a market by itself and optimizing the opposing and often conflicting interests of different stakeholders (clients, personnel, financiers, management, public authorities, non-governmental organizations). The rationale of the corporate enterprise is that it creates goods and services, which cannot be produced, or only at a higher price, by consumers themselves. This exclusive function justifies transaction costs, which are seen as a form of market imperfection. The mainstream theory of the firm evolved under the paradigm of the agency theory and the transaction costs theory as a theory of economic organization rather than as a theory of entrepreneurship.

A separate line of thinking in the theory of the firm is the dynamic market approach of Schumpeter (1912), who stressed the essential function of entrepreneurs as innovators, creating new products and new distribution methods in order to gain competitive advantage in constantly developing and changing markets. In this approach, markets and enterprises are in a continuous process of "creative destruction" and the entrepreneurial function is pre-eminently dynamic. Basic inventions are more or less exogenous to the economic system; their supply is perhaps influenced by market demand in some way, but their genesis lies outside the existing market structure. Entrepreneurs seize upon these basic inventions and transform them into economic innovations. The successful innovators reap large short-term profits, which are soon bid away by imitators. The effect of the innovations is to disequilibrate and to alter the existing market structure, until the process eventually settles down in wait for the next (wave of) innovation. The result is a punctuated pattern of economic development that is perceived as a series of business cycles. Financial intermediaries, the ones that mobilize savings, allocate capital, manage risk, ease transactions, and monitor firms, are essential for economic growth and development. That is what Joseph Schumpeter argued early in this century. Now there is evidence to support Schumpeter's view: financial services promote development (see King and

Levine, 1993; Benhabib and Spiegel, 2000; Arestis et al., 2001; Wachtel, 2001). The conceptual link runs as follows: Intermediaries can promote growth by increasing the fraction of resources society saves and/or by improving the ways in which society allocates savings. Consider investments in firms. There are large research, legal, and organizational costs associated with such investment. These costs can include evaluating the firm, coordinating financing for the firm if more than one investor is involved, and monitoring managers. The costs might be prohibitive for any single investor, but an intermediary could perform these tasks for a group of investors and lower the costs per investor. So, by researching many firms and by allocating credit to the best ones, intermediaries can improve the allocation of society's resources. Intermediaries can also diversify risks and exploit economies of scale. For example, a firm may want to fund a large project with high expected returns, but the investment may require a large lump-sum capital outlay. An individual investor may have neither the resources to finance the entire project nor the desire to devote a disproportionate part of savings to a single investment. Thus profitable opportunities can go unexploited without intermediaries to mobilize and allocate savings. Intermediaries do much more than passively decide whether to fund projects. They can initiate the creation and transformation of firms' activities. Intermediaries also provide payment, settlement, clearing and netting services. Modern economies, replete with complex interactions, require secure mechanisms to settle transactions. Without these services, many activities would be impossible, and there would be less scope for specialization, with a corresponding loss in efficiency. In addition to improving resource allocation, financial intermediaries stimulate individuals to save more efficiently by offering attractive instruments that combine attributes of depositing, investing and insuring. The securities most useful to entrepreneurs – equities, bonds, bills of exchange – may not have the exact liquidity, security, and risk characteristics savers desire. By offering attractive financial instruments to savers – deposits, insurance policies, mutual funds, and, especially, combinations thereof – intermediaries determine the fraction of resources that individuals save. Intermediaries affect both the quantity and the quality of society's output devoted to productive activities. Intermediaries also tailor financial instruments to the needs of firms. Thus firms can issue, and savers can hold, financial instruments more attractive to their needs than if intermediaries did not exist. Innovations can also spur the development of financial services. Improvements in computers and communications have triggered financial innovations over the past 20 years. Perhaps, more important for developing countries, growth can increase the demand for financial services, sparking their adoption.

In translating these concepts to the world of financial intermediation, one ends up at the so-called functional perspective (see Merton, 1995a). The functions performed by the financial intermediaries are providing a transactions and payments system, a mechanism for the pooling of funds to undertake projects, ways and means to manage uncertainty and to control risk and provide price information. The key functions remain the same, the way they are conducted varies over time. This looks quite similar to what Bhattacharya and Thakor (1993) regard as the qualitative asset transformation operations of financial intermediaries, resulting from informational asymmetries. However, in our perspective, it is not a set of operations *per se* but the *function* of the intermediaries that gives way to their presence in the real world. Of course, we are well aware of the fact that in the real-world the everyday performance of these different functions can be experienced by clients as – to quote Boot (2000) – ”an annoying set of transactions”.

The key functions of financial intermediaries are fairly stable over time. But the agents that are able and willing to perform them are not necessarily so. And neither are the focus and the instruments of the financial supervisors. An insurance company in 2000 is quite dissimilar in its products and distribution channels from one in 1990 or 1960. And a bank in Germany is quite different from one in the UK. Very different financial institutions and also very different financial services can be developed to provide the *de facto* function. Furthermore, we have witnessed waves of financial innovations, consider swaps, options, futures, warrants, asset backed securities, MTNs, NOW accounts, LBOs, MBOs and MBIs, ATMs, EFTPOS, and the distribution revolution leading to e-finance (e.g. see Finnerty, 1992; Claessens et al., 2000; Allen et al., 2002). From this, financial institutions and markets increasingly are in part complementary and in part substitutes in providing the financial functions (see also Gorton and Pennacchi, 1992; Levine, 1997).

Merton (1995a) suggests a path of the development of financial functions. Instead of a secular trend, away from intermediaries towards markets, he acknowledges a much more cyclical trend, moving back and forth between the two (see also Rajan and Zingales, 2000). Merton argues that although many financial products tend to move secularly from intermediaries to markets, the providers of a given function (i.e. the financial intermediaries themselves) tend to oscillate according to the product-migration and development cycle. Some products also move in the opposite direction, for example the mutual fund industry changed the composition of the portfolios of US households substantially, that is, from direct held stock to indirect investments via mutual funds (Barth et al., 1997). In our view, this mutual

fund revolution in the US – and elsewhere – is a typical example of the increasing role for intermediated finance in the modern economy.

Thus, in our opinion, one should view the financial intermediaries from an evolutionary perspective. They perform a crucial economic function in all times and in all places. However, the form they have changes with time and place. Maybe once they were giants, dinosaurs so to say, in the US. Nowadays, they are no longer that powerful but they did not lose their key function, their economic niche. Instead, they evolved into much smaller and less visible types of business, just like the dinosaurs evolved into the much smaller omnipresent birds.

Note that most of the theoretical and empirical literature actually refers to banks (as a particular form of financial intermediary) rather than to all financial institutions conducting financial intermediation services. However, the bank of the 21st century completely differs from the bank that operated in most of the 20th century. Both its on- and off-balance sheet activities show a qualitatively different composition. That is, away from purely interest related lending and borrowing business towards fee and provision based insurance-investment-advice-management business. At the same time, the traditional insurance, investment and pension funds enter the world of lending and financing. As such, financial institutions tend to become both more similar and more complex organisations. Thus, it appears that the traditional banking theories relate to the creation of loans and deposits by banks, whereas this increasingly becomes a smaller part of their business. This is not only because of the changing composition of their income structure (not only interest-related income but also fee-based income). Also it is the case because of the blurring borders between the operations of the different kinds of financial intermediaries. Therefore, we argue first that the loan and the deposit only are a means to an end – which is acknowledged both by the bank and the customer – and that the bank and the non-bank financial intermediary increasingly develop qualitatively different (financial) instruments to manage risks.

Questioning whether informational *asymmetry* is the principal explanatory variable of the financial intermediation process – what we do – does not imply denial of the pivotal role information plays in the financial intermediation process. On the contrary, under the strong influence of modern communication technologies and of the worldwide liberalization of financial services, the character of the financial intermediation process is rapidly changing. This causes a – until now only relative – decrease in traditional

forms of financial intermediation, namely in on-balance sheet banking. But the counterpart of this process – the increasing role of the capital markets where savers and investors deal in marketable securities thanks to world wide real time information – would be completely unthinkable without the growing and innovating role of financial intermediaries (like investment banks, securities brokers, institutional investors, finance companies, investment funds, mergers and acquisition consultants, rating agencies, etc.). They facilitate the entrepreneurial process, provide bridge finance and invent new financial instruments in order to bridge different risk preferences of market parties by means of derivatives. It would be a misconception to interpret the relatively declining role of traditional banks, from the perspective of the financial sector as a whole, as a general process of disintermediation. To the contrary, the increasing number of different types of intermediaries in the financial markets and their increasing importance as financial innovators point to a swelling process of intermediation. Banks reconfirm their positions as engineers and facilitators of capital market transactions. The result is a secular upward trend in the ratio of financial assets to real assets in all economies from the 1960s onwards (see Table 3).

It appears that informational asymmetries are not well-integrated into a dynamic approach of the development of financial intermedation and innovation. Well-considered, information, and the ICT revolution, plays a paradoxical role in this process. The ICT revolution certainly has an excluding effect on intermediary functions in that it bridges informational gaps between savers and investors and facilitates them to deal directly in open markets. This function of ICT promotes the exchange of generally tradable, thus uniform products, and leads to the *commoditizing* of financial assets. But the ICT revolution provokes still another, and essentially just as revolutionary, effect, namely the *customizing* of financial products and services. Modern network systems and product software foster the development of ever more sophisticated, specific, finance and investment products, often embodying option-like structures on both contracting parties which are developed in specific deals, thus “tailor made”, and which are not tradable in open markets. Examples are specific financing and investment schemes (tax driven private equity deals), energy finance and transport finance projects, etc. They give competitive advantages to both contracting parties, who often are opposed to public knowledge of the specifics of the deal (especially when tax aspects are involved). So, general trading of these contracts is normally impossible and, above all, not aimed at. (But imitation after a certain time lag can seldom be prevented!) Informational data (on stock prices, interest and exchange rates, commodity and energy prices,

macroeconomic data, etc.) are always a key ingredient of these investment products and project finance constructions. In this respect, information is attracting a pivotal role in the intermediation function because it is mostly the intermediation industry, not the ultimate contract parties that develop these new products and services. The function of information in this process, however, differs widely from that in the present intermediation theory. Intermediaries are, in this evolutionary development of their basic functions, not busy by alleviating asymmetric information problems between market parties, but by providing *unique* information to market parties as an integral part of their intermediary function. In this role, the intermediaries are not victims of the ICT revolution, bound to be excluded, but beneficiaries, grateful for the opportunities ICT creates. They use it in their innovative products and they stimulate the growth of ICT. Their move into e-banking / e-finance is a spectacular example of this development. It appears that the ICT revolution has not so much led to the end of intermediation, but rather to new methods and types of intermediation. Transaction costs do not disappear because of this revolution, but they take a different form, namely as costs for information gathering, selection, and processing. Traditional transaction costs indeed are reduced. Informational innovations have an increasing impact on financial product development and risk management. Financial innovation focuses on risk management, especially of currency, interest rate and credit risk (Caouette et al., 1998; Saunders, 1999). Allen and Gale (1997, 2000a) point at this role for financial intermediaries when they assess the impact of shocks via the financial system on the real economy. However, they do not go into the theoretical consequences.

In the next sections, we come up with the rationale for an alternative approach of financial intermediation and present building blocks for an alternative for informational asymmetry as the key rationale for the existence and behavior of financial intermediaries.

6. An Alternative Approach of Financial Intermediation

When information asymmetries are not the driving force behind intermediation activity and their elimination is not the commercial motive for financial intermediaries, the question arises which paradigm, as an alternative, could better express the essence of the intermediation process. In our opinion, the concept of *value creation* in the context of the value chain might serve that purpose. And, in our opinion, it is *risk* and *risk management* that drives this value creation. The concept of value creation, introduced by Michael Porter (1985), can be seen as a dynamic extension of the theory of industrial organization, in the tradition of Joseph Schumpeter. It represents the other side of the coin, which glitters in the theory of the firm: transaction costs are incurred to create value. It is amazing that the value added approach, now widely recognized and applied in the literature on business organization, management and finance (e.g. EVA, Economic Value Added; see Damodaran, 1996; Grinblatt and Titman, 1998), has not yet been widely used to explicitly explain the operations of the financial industry. There are a few noticeable exceptions: Jordi Canals (1993) describes the value creation process in banking in his book "Competitive Strategies in European Banking", making reference to Porter. However, he does not elaborate on this concept to create an alternative to the existing paradigm of financial intermediation. Nor does he go into depth to explain the basic process of value creation by financial intermediaries. David Llewellyn's concept of contract banking is also based on the value chain idea (Llewellyn, 1999). But here too, there emerges no alternative for the mainstream view on financial intermediation.

What value do financial intermediaries add? They offer financial services, embodied in financial instruments, to savers and (real) investors. These instruments are not created by savers and investors themselves and, in many cases, cannot be created by them individually. This value creation process is intensified by the competition in the market place between existing financial institutions and by new entrants, which strongly stimulates the innovation of new financial products in order to compensate for profit erosion on existing, standard products. The contemporary banking theory distinguishes between four main banking functions: payment services, asset transformation, risk management and information processing, and borrowers monitoring. All four aim at the active offering of financial services and instruments to market parties according to their needs and preferences. Intermediaries must translate needs and preferences of savers and investors into appropriate services and

instruments. This requires a very active role of the intermediaries and results in an endless stream of new products: All kinds of payment accounts, credit cards, on line payment facilities, overdraft facilities, letters of credit, medium term credits, revolving credits, rollovers, commercial paper financing, asset backed financing, cash flow based project finance, deposit arrangements, money market funds, savings accounts, insurance linked savings instruments, investment linked mortgage financing, unit linked pension schemes, equities, bonds and hybrids between these, warrants, custody, stock lending, trust services and last but not least the vastly increasing number of derivative instruments, listed on exchanges and increasingly over-the-counter. All these products are developed by the financial industry – mostly banks and insurance companies – and not by the ultimate savers and investors themselves. It is the financial intermediary who innovates and whose marketing efforts aim at the use of the innovation (see also Merton, 1995a, b).

As soon as others imitate financial instruments, especially when they are standardized and made tradable in open markets, strong competition threatens all offering market parties. A rational answer of the financial entrepreneur to imitating behavior is to develop new, specialized instruments for new specific markets. As soon as an open, transparent market with standardized products is developed, that means as soon as the stage of a 'perfect market' is reached, market parties try to escape extinction – resulting from the truly zero profits that perfect competition might incur – by creating new submarkets with new specific products. In this respect, we may draw a parallel with Kelvin Lancaster's approach in microeconomic analysis, which posits that products are simply bundles of characteristics (Lancaster, 1966). Similarly, financial products are permutations of different characteristics that are mostly based on risk management. Financial institutions try to survive by market differentiation, by "fragmenting" the market for financial products into an ever-growing number of submarkets for their special products. This means that the function of intermediaries is not to bridge as agents an information gap between market parties and by doing so to decrease market imperfection, but to create, as risk transformers, new markets. Because they add value to clients, these clients are not interested in the full transparency of the deal to other market participants. Sometimes, they will even be opposed to immediate transparency of a new product, in particular when these clients have incurred costs for the development of the value received. So, newly developed submarkets essentially are imperfect. Competing financial institutions will, however, as soon as new markets show success, imitate the new product, standardize it as far as possible and, by doing so, make the market more transparent, and thus more perfect. Facilitated by the ICT

revolution, this is a rapidly ongoing process. Thus, the survival instinct of the financial intermediary that results in market differentiation, results also in temporary situations of monopolistic competition or even monopoly, that inherently undermines the perfect market.

The financial instruments are in most cases not developed to be traded between savers and investors in open markets – listed securities and derivatives being the only exception – but to be offered by financial institutions in one-to-one transactions. Their capital strength, liquidity, professionalism, and reputation of trust and confidentiality are key assets here. The current intermediation theory assumes that financial services are commodities, uniform tradable goods responding completely to the needs and preferences of savers and investors at a price and that the function of the financial intermediation industry is to mediate between savers and investors by providing them information on the commodity. But that essentially is only the function of the stockbroker on the stock exchange. All other financial intermediaries do not restrict their activities to intermediation in that strict sense. They transform deposited amounts into amounts needed for financing real investments, they absorb counterparty risk by providing loans to entrepreneurs and duration risk by guaranteeing liquidity to savers. Insurance companies and pension funds also provide and guarantee liquidity to savers, be it under other, more specific, conditions than banks. Viewing the financial product as a bundle of attributes in the tradition of Lancaster (1966) appears to be more fruitful as this is indeed helpful to understand the dynamics of the financial world.

Thus, contemporary banking theory rightly points out that financial intermediaries have a role in both brokerage and qualitative asset transformation. But contemporary banking theory wrongly concentrates on informational asymmetries to explain financial intermediation. These only suffice to understand the brokerage function. However, to a large extent, it fails to understand the qualitative asset transformation function of the intermediaries. To explain this function, we are indeed in need of a different – functional, as Merton (1995a, b) puts it – perspective of financial intermediaries.

In our opinion, risk is not playing the central role it deserves in the financial intermediation theory. Allen and Santomero (1997) make the same observation, but only to a limited extent. They review the state of intermediation theory and attempt to reconcile it with the observed behavior of institutions in modern capital markets. They argue that many current theories of intermediation are too heavily focused on functions of institutions

that are no longer crucial in many developed financial systems. These theories focus on products and services that are of decreasing importance to the intermediaries, while they are unable to account for those activities which have become the central focus of many institutions. They suggest that the literature's emphasis on the role of intermediaries as reducing the frictions of transaction costs and asymmetric information is too strong; while these factors may once have been central to the role of intermediaries, they are increasingly less relevant. In its place, the authors offer a view of intermediaries that centers on two different roles these firms currently play: they are facilitators of risk transfer and they deal with the increasingly complex maze of financial instruments and markets. Risk management has become a key area of intermediation activity, though intermediation theory has offered little to explain why institutions should perform this function. In addition, they argue that the facilitation of participation in the financial markets is an important service provided by these firms. Allen and Santomero suggest that reducing participation costs, which are the costs of learning about effectively using markets as well as participating in them on a day to day basis, play an important role in understanding the changes that have taken place. We disputed that risk management is only of recent importance to the financial industry earlier on (Scholtens and van Wensveen, 2000). Furthermore, we doubt the crucial importance of lower participation costs for the understanding of the current activities of intermediaries. Risk absorption, and therefore risk management, is and has always been their *raison d'être*.

In the current theory of financial intermediation, risk appears as a negatively operating, almost peripheral, factor. It is thought to result in adverse selection, credit rationing and moral hazard, which results in effects that frustrate the optimal allocation of savings. The absorption of risk, however, is *the* central function of both banking and insurance. The risk function bridges a mismatch between the supply of savings and the demand for investments as savers are on average more risk averse than investors. Risk, that means maturity risk, counterparty risk, market risk (interest rate and stock prices), life expectancy, income expectancy risk etc., is the core business of the financial industry. Financial intermediaries can absorb risk on the scale required by the market because their scale permits a sufficiently diversified portfolio of investments needed to offer the security required by savers and policyholders. Financial intermediaries are not just agents who screen and monitor on behalf of savers. They are active counterparts themselves offering a specific product that cannot be offered by individual investors to savers, namely the cover for risk. They use their reputation and their balance sheet and off-balance items, rather than their very limited own funds, to act as such counterparts.

The mainstream of financial innovations in the past decades was centered around risk: risk as a threat, as the possibility of a loss, but also as an opportunity for profit. Swaps, options, futures are the most illustrative examples of that, but also warrants on equities and a variety of hybrid instruments between shares and bonds, term loans with variable maturities, interest rate caps and floors, credit derivatives, combined mortgage finance investments plans, mortgage backed life insurance saving plans, unit trust investments plans, etc. But not only in the recent past: risk is and has always been the heart of the insurance industry and also of banking. The process of risk transformation is expressed in their balance sheets and in their off-balance sheet items. Banks also push the development and marketing of financial instruments traded at stock exchanges. The marketing of these instruments implies a risk taking commitment, at least temporary, by banks when they underwrite the public issue of these titles. Furthermore, it is important to note that parallel to the growing volume of instruments traded at the stock exchanges, where banks act as brokers, there is a strongly growing volume of bilaterally traded risk instruments like future rate agreements, currency and interest rate swaps and options with tailor made conditions (exotic options), where banks are both the developers and the counterparties in the deal themselves.

Thus, in effect, financial innovation involves creating instruments with different combinations of existing characteristics rather than entirely new ones. When all possible combinations would have been created, we are in the Arrow-Debreu world. However, under the Moon, we have zillions of missing markets. Financial innovations inch us slowly to the Arrow-Debreu world but in the meantime this world gets further and further away and, therefore, heaven on Earth becomes even more difficult to achieve.

So, risk transformation, not dealing with information and agency problems, is at the heart of financial intermediation.[5] Risk, and not asymmetric information fuels its activity and risk taking basically determines the value addition of financial intermediation to national income. The growing importance of risk and the growing need of risk absorbing institutions and instruments can explain the growing importance of the financial industry to

[5] Hakenes (2002) is an example of a study that puts risk management at the core of the theory of banking. Banks are not delegated monitors, but delegated managers. However, Hakenes does not include the investor's and depositor's perspective in his analysis. And, essentially, it is the combination of lending and investing and accepting money that distinguishes the financial intermediary from other types of organisations.

the national income. The demand for risk covering instruments grows and will continue to grow, under the increasing volatility of interest rates, stock prices and foreign exchange rates. The invention of new instruments and the adaptation of existing ones to specific, tailormade solutions for specific needs of debtors or creditors is an answer to that need and also to the growing competition within the financial industry and from outside.[6]

[6] One may wonder whether "informational asymmetry" does not include "risk", since lack of transparency in a specific (bargaining) situation involves a risk for at least one of the contracting parties. This is true, but "risk" involves more than uncertainty by a lack of complete information. "Risk" predominantly refers to a chance of unpredictable emergencies for both contracting parties. In other words, not asymmetric distribution of information but no (secure) information at all, even with perfect *ad hoc* information on both sides, on future events is at the heart of the financial business. In fact, we find the Knightian distinction between risk and uncertainty quite relevant in this matter.

7. Building Blocks for an Amended Theory

Table 4 summarizes the keystones for a complete new understanding of the financial intermediation process and for a future direction of the theory of financial intermediation. It compares these with the key concepts of current financial intermediation theory. The building blocks of the amended theory fundamentally differ from those of the existing theory. As has been said in the beginning of this essay, there is a difference in paradigm; a completely different perspective that is taken to look at the same phenomenon. Fortunately, it should be noted that in almost all of the new building blocks, extensive research based on the concepts we indicate is well underway, as we will conclude in the next section on the research agenda, but gaps are still there. The research we refer to does hardly, or only very indirectly, point to the essence of the intermediation process, deriving its dynamics from specific basic views and problems (see Zingales, 2000).

The "oneliners" in Table 4 may be clarified in the following summary of our argument. The static concept of a perfect, fully transparent market where homogenous products are traded between numerous parties who have no individual influence on equilibrium prices has a limited significance as a benchmark for the financial intermediation process. This is the case even after, and paradoxically, to a considerable extent due to, the information and communication revolution. The public financial markets – which are growing in importance – seem to approach the characteristics of a perfect market but they remain in a continuous process of development and change, both with regard to the traded instruments and to the institutions that service the trading on the public markets. This process is conditioned by the expertise of investment banks and the underwriting risk taking of banks, as well as by the asset management expertise of banks, insurers and investment funds. Without these intermediaries the public markets could not exist. Traditional corporate banking is under pressure from this move towards public markets, but evolves toward specific solutions for corporate finance (cash flow based project finance, leasing, etc.). Retail banking innovates by blending private savings, insurance, finance and investment products and marketing these through a diversity of distribution channels on a mass scale. Financial intermediaries "de-homogenize" the markets by carving out niches for specific product-market combinations and in specific geographical areas where their position is strong. By doing so they differentiate the market and create market imperfections in so far as new products or databases for marketing contain

unique, captive information. This process of building up market imperfections in niche markets goes hand in hand with the leveling off of market imperfections in the public markets trading. It is the process of creative destruction, as described by Schumpeter (1912).

Table 4: (Stylized) Contemporary and Amended Theory of Financial Intermediation[1]

(Stylized) contemporary theory	Amended theory
● Static: perfect market differentiation	● Dynamic: market development; market
● Market imperfections development	● Product innovation and market
● Financial intermediary is an agent between savers and investors, monitors loans on behalf of depositors	● Financial intermediary is an entrepreneurial provider of financial services
● Efficient allocation of savings	● Qualitative asset transformation; risk transformation
● Transaction costs	● Value creation
● Asymmetric information	● Customer orientation, both to real investors and savers
● Adverse selection, moral hazard, credit rationing, auditing	● Risk management; risk/reward optimization
● Regulation as market imperfection	● Regulation for institutional and systemic risk control
● Disintermediation	● Dynamics of intermediation (new markets, new products, new agents)

[1] This table is – with adaptations – derived from Scholtens and van Wensveen (2000).

The justification for newly created market imperfections lies in *the creation of value* for the customer in the new, specific products. Value creation for the customer is the rationale of intermediary activity. Value creation justifies transaction costs paid to the intermediary. The value that a financial intermediary creates results from the qualitative asset transformation it performs. The core of this qualitative asset transformation is risk transformation. By transforming risk – either through the balance sheet or off-balance through derivative obligations – the intermediary transforms assets offered by savers following their risk preferences into assets usable by entrepreneurial investors. Intermediary activity comes in where supply and demand of capital cannot be (fully) met according to the risk preferences of market parties in the public market. Adverse selection and credit rationing can disturb the intermediation process when information flows stagnate or become unreliable (corporate disclosure fraud) or when idiosyncratic shocks (e.g. affecting sovereign risk) happen. These generally lead to temporary

market imperfections which have little to do with the normal intermediation process.

The value creation process of banks evolves over time. Generally speaking it moves from on-balance to off-balance activities, from risk absorption through financing to risk management and absorption via capital market operations. Moreover, the specific functions of individual banks in the value chain evolve too. Vertical integration of these functions is not essential any more; delivery and manufacturing of banking services can be separated via in- and out-sourcing contracts. "Contract banking" structures (Llewellyn, 1999) provide for adaptation to the dynamics of value creation in the financial services industry.

Because asset transformation is a risky business and because money and financial assets grease the economy, the financial intermediaries are placed under the surveillance of regulators. This happens in the interest of savers who deposit their money with intermediaries or build up contingency claims with them, and in the interest of the financial system as a whole (systemic risk). Moral hazard can be a by-product of regulation and creates a market imperfection, which must be weighed against the importance of certain regulatory measures or interventions. However, moral hazard does not offset the overriding importance of an adequate regulatory system as a supervisor over the quality of risk management by intermediaries.

Presumably because the need for risk transformation is so large and still increasing, intermediaries remain to find a solid place in the financial arena. Their contribution to national income grows. This does not imply that every type of financial intermediation faces a bright future. Traditional corporate banking is in decline; traditional equity brokerage too. But specialist corporate banking, investment banking, retail banking and life insurance, investment fund management and specialist corporate and investment risk management are expanding, be it with more volatile results than before. There certainly is a decline of some forms of intermediation, but there is no question at all of disintermediation as a general process in the economy. Banking remains essential to a modern society, but not necessarily executed by traditional banks.

Does the amended theory fully contradict the present one and have the concepts of the present theory become obsolete? The concepts of the present theory of financial intermediation do remain adequate for the analysis of the financial intermediation, both at the macroeconomic and at the

microeconomic level. As such, the main research object of financial intermediary is the optimal allocation of savings and investments within households and the economy as a whole, with institutional and behavioral frictions preventing optimal allocation. Here, the concept of asymmetric information remains very useful. The functioning of the international financial system in general and problems of systemic risk are well analyzed with the tools of contemporary banking theory (adverse selection, credit rationing, moral hazard; see Holmström and Tirole, 2001). Secondly, the microeconomic case studies of entrepreneurial and managerial behavior of financial intermediaries have got a generally recognized record, applying game theory type of models using present theory concepts. The empirical verification of these models remains, however, problematic; the evidence is usually rather anecdotal. The contemporary theory of financial intermediation is not well-equipped to explain market dynamism, the flow of product innovations, the effects of technological advance, and above all, it does not give the right, pivotal, role to risk transformation and management. An amended theory is necessary to explain what was, is, and remains the essential function of banking and finance, how this function leads to new risk products, both for the intermediaries' own account (like "over the counter derivatives", fiscal driven leasing finance, different types of project finance) and new risk products developed by them for the open market, like convertibles, warrants, asset backed securities, etc.

8. A New Research Agenda

Would the amended theory of financial intermediation lead to a new research agenda? Partly. Battacharya and Thakor have listed what they regard as the key questions and puzzles for financial intermediation research in 1993. Let us start with this old agenda, what is still open on it, and add research items which would benefit from our amended approach. As "unresolved issues" Battacharya and Thakor mention first: "What is the role of financial institutions in financial innovation?". This evidently is a subject "par excellence" for analysis with concepts like the ones mentioned above. "What are the economic bases for differences among financial systems across countries and through time?" is their second issue. This is a wide area of research since Gerschenkron (1962) and Goldsmith (1969), gaining topicality in view of the developments in Eastern Europe and Central Asia, and with the financial crises in Asia and Latin America in mind. The theory of financial systems, however, so far appears to ignore the poorer areas in the world (the work of Allen and Gale (2000b) is illustrative in this respect). It encompasses empirical description, modeling and testing of different financial systems in their relation to macroeconomic growth patterns. Is the financial system welfare improving, welfare destroying or neutral? The evolution of the financial markets and financial innovation, next to optimal allocation of savings, should become analytical concepts of central importance. Institutional developments (role of governments, banking supervision, governance of market parties, problems of "crony capitalism") are gaining analytical attention as well in this research area (see Beck et al., 2000; Beck and Levine, 2000; Demirgüç-Kunt and Maksimovic, 2000; Pagano and Volpin, 2000; Rajan and Zingales, 2000).

"What are the issues in banking system design?" is the next topic listed by Bhattacharya and Thakor. Here, the authors mean primarily the optimal size of banks: are bank mergers beneficial to welfare? These issues, including those of competition between banks and other financial institutions and the question of whether some countries are overbanked, need an industrial economics and a product innovation/market development approach as well. A rich stream of research has become available on these issues, especially in the US, but recently for Europe as well (see Molyneux et al., 1997; Piloff and Santomero, 1998; Berger et al., 1999; Altunbas et al., 2000; Berger et al., 2000; Focarelli and Pozzolo, 2001). Up till now, the results show little proof of economies of scale and scope in the United States but some scale

efficiencies were concluded by Altunbas et al. (2000) in the wake of the Europe 1992 program. In general, the optimal scale found in most studies is much smaller than that of the modus of bank size in most modern economies. The studies also reveal skepticism in the blessings of bank mergers. Others (e.g. Boot and Schmeits, 1999) presume that scale and scope economies could re-emerge as critical issues in the future as a consequence of technical progress, especially in payment systems. The dynamics of technologically driven product innovation will have to be introduced in the scale and scope and X-inefficiency research. Piloff and Santomero (1998) make the value-effects of bank mergers already an explicit subject of their research. The new research on essential and less essential bank functions and the concept of "contract banking" (Llewellyn, 1999. See also Claessens et al., 2000) are also an example of the new dynamic value-chain approach.

"How should securities markets and non-bank financial intermediaries be structured and regulated?" is the issue Bhattacharya and Thakor listed last. "Regulation interferes in the intermediation process and it makes the financial sector an even more imperfectly competing – in more than one respect – industry, as regulation by its nature is based on imperfect information for all other market participants" they say. Indeed, imperfect information is one of the headaches of regulators and a source of inspiration to market parties who like to create novelties falling beyond existing regulation or to arbitrage around rules and regulations. Regulations have a clear impact, both intentionally and unintentionally, on market prices and on the innovative behavior of intermediaries. Too static models fall short and need to be complemented by dynamic approaches encompassing the impact of regulation on product development. Regulatory dialectic (Kane, 1977) is an example of the dynamic approach towards regulation. The regulation of securities markets and non-bank financial institutions is mostly the domain of public authorities. Usually, this regulation is to some extent made up in discussion with market parties. Scientific analysis, based on asymmetric information and risk containment concepts has strongly gained ground in the meantime. (It is curious to note that Bhattacharya and Thakor (1993) did *not* list bank regulation on their list of unresolved issues!). Freedman (2000) goes into the extent to which financial intermediation theory can act as a guidance in designing an effective regulatory framework.

Since Bhattacharya and Thakor drew up their research agenda for contemporary banking theory in 1993, risk management and risk transformation in the intermediation process have become a common denominator in the research on financial intermediaries and financial

intermediation. Risk transformation and management in the intermediation process has since then become a common denominator in the research agenda. Risk analysis is, since the emergence of the capital asset pricing models and asset pricing theory, fully incorporated at the firm level in pricing models and plays the central role in research of securities and derivatives. Value-at-risk is also becoming the central theme in bank regulation (see the Basel II framework on monitoring financial risks and risk management with banks and on providing incentives for adequate amounts of capital). And risk management has gained attention at both the firm-level and the macro-economy (Hunter and Smith, 2002). Other questions are: What is the remuneration to the financial industry for its risk transforming activity? Is this remuneration adequate in view of losses incurred by bad debts, exchange risk, interest rate and stock price movements? What is the RAROC of the banking industry as a whole? Is the risk absorbing function of the financial industry increasing because of a growing volatility of risk causing economic factors (interest rates, exchange rates)? And how is this volatility related to the income of the industry? Does the increasing contribution of the financial industry to GNP reflect the compensation for increasing risks? Is the increasing risk absorption by financial intermediaries reflected in the level and volatility of the stock prices of these institutions? What margins should they earn to remain in a position to raise stock in the future? On the level of the banking firm the new approaches to value-at-risk and credit risk management have already opened a vast domain for further research (e.g. Caouette et al., 1998; Saunders, 1999, Bessis, 2002).

All these questions and others which emerge from the dynamics of financial intermediation appear to be relevant nowadays and may invite curious researchers to take brave new steps in the unknown. We would welcome such steps and invite these researchers to innovate the current theories of financial intermediation into ones that are able to understand and to explain the function and behavior of real-life financial intermediaries in our modern society.

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Appendix A: Raymond W. Goldsmith's (1969, 44-48) Stylized Facts on Financial Structure

1. In the course of economic development a country's financial superstructure grows more rapidly than the infrastructure of national product and national wealth. Hence the financial interrelations ratio (the quotient of the aggregate market value of all financial instruments in existence in a country at a given date to the value of its tangible net national wealth) has a tendency to increase.
2. This increase in a country's financial interrelations ratio, however, is not a process that continues without limit.
3. Economically less developed countries have much lower financial interrelations ratios than those which prevail in Europe or North-America.
4. The main determinant of the relative size of a country's financial superstructure is the separation of the functions of saving and investing among different economic units and groups of them.
5. In most countries the share of financial institutions in the issuance and the ownership of financial assets has considerably increased in the process of economic development.
6. This "institutionalization" of saving and of the ownership of financial assets has affected the main types of financial instruments differently.
7. Financial development in the modern sense has started everywhere with the banking system and has been dependent on the diffusion of scriptural money through the economy.
8. As economic development has progressed, the share of the banking system in the assets of all financial institutions has declined, though its share in the country's total financial assets has continued to increase for a while.
9. Foreign financing, as either a source of funds supplementing those domestically available or as an outlet for funds not easily utilizable within the country, has played a substantial role in some phase of the development of most countries.
10. Probably as important for the financial development of most countries as these flows of funds across international boundaries was the example provided by the more advanced countries. Transfer of technology and entrepreneurship have been easier to accomplish, and on the whole more successful, with respect to financial instruments and financial institutions than in many other fields.
11. The cost of financing, including interest rates and other charges, is distinctly lower in financially developed than in less developed countries, with occasional exceptions mainly reflecting the effects of inflation.
12. As real income and wealth increase, in the aggregate and per head per population, the size and complexity of the financial superstructure grow.

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