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**CONVERGENCE OF FINANCIAL SYSTEMS: TOWARDS AN
EVOLUTIONARY PERSPECTIVE**

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CONVERGENCE OF FINANCIAL SYSTEMS: TOWARDS AN EVOLUTIONARY PERSPECTIVE

by

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This paper is a draft and subject to change. Comments are welcome.

Abstract

This paper provides an evolutionary perspective on financial systems based on complex systems theory. This perspective is used to organize the discussion about the convergence and non-convergence of financial systems. In recent years the discussion about the relative merits and the efficiency of market- and bank-based financial systems is subject to considerable academic and policy debate throughout the world. Bank- and market-based systems are found to give rise to different economic and corporate dynamics. Based on a notion of financial systems as configuration of complementary elements, it is suggested that the convergence of financial systems is best conceptualized as path dependent process of institutional change. This is illustrated with special reference to the recent developments of convergence of financial systems in Europe. The implication of the evolutionary perspective on financial systems is that neither theories using a simple evolutionary argument of survival of the fittest nor theories related to a institutional ossification perspective can provide much guidance for analyzing the transformations of financial systems. A multilevel institutional analysis which takes the interdependencies between national and firm-level institutions explicitly into account is required

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Keywords

Institutional convergence of financial systems, NK model, systems competition, complementarity, path dependency, corporate governance

JEL

G20, G34, O16, P51

1. Introduction

This paper is concerned with the discussion of financial systems, their description and analysis. In the traditional economic literature the notion of financial system is not well established. The lack of interest is related to the neglect of market imperfections in the paradigm of General Equilibrium economics. The Modigliani Miller theorem is a symptom of this neglect. In contrast to this, Josef Schumpeter and other heterodox economists have emphasized the importance of financial systems for economic development and the structural change of financial systems. Only in the last decade the notion of the financial system became a central element in the comparative literature on corporate finance and corporate governance. Thereby financial systems were put back into a central stage in both economic theory and economic policy. The new approach to finance, which is often labeled 'functionalist approach' (Levine 1997) takes issues of information asymmetries and costs as its starting point. The key assertion is that it is costly to gather information on firms and their investment projects. The financial sector thus not only passively channels saving from households to investment, but plays an active role in allocating savings. The financial sector monitors management and investment projects and thereby performs supervision and control functions for non-financial industries. It is argued that efficient financial systems are characterized by a combination of large stockholders and a legal system which protects the rights of outside investors (Schleifer and Vishny 1997, Berglöf 1997). However, each national system has its own rules and conflicts, and is different in its configuration. This suggests underlying systemic relationships.

Following Gerschenkron's (1962) pioneering study on the differences of the financial systems between Germany and the UK, there is now a large literature on comparative financial systems. In this literature especially the differences between the USA, the UK, Germany and Japan and the distinction between market- and bank-based systems has received much attention (e.g. Ryzbczinski 1985, Dosi 1990, Berglöf 1990, Rajan and Zingales 1995, 1998, Grabel 1997, Schaberg 1999). Also the relationship between financial structures and economic growth has received renewed interest. The striking differences across countries raises the question: *Is one system inherently better than another?* Or put in other words: do different financial systems affect (i) the rates at which resources are accumulated, (ii) their employment, and (iii) the economic efficiency of their uses? Or do financial institutions not matter in terms of real aggregate dynamics of the fundamentals of the economy (technology, preferences and income distribution)? The answer to such a question is extremely difficult because macroeconomic conditions, tax incentives, comparative and competitive advantages

in trade differ cross-sectionally and over time. A number of studies has confirmed that financial systems are an important determinant for economic development (see Levine 1997). However, cross-national evidence also suggests that credit and stock market development is complementary (Demirgüç-Kunt and Levine 1996).

While most studies concentrate on the link between financial systems and economic growth, this contribution looks at the foundations of the differences between financial systems. The paper is organized as follows. I start by outlining the basic stylized differences of stylized bank and market-oriented systems in section 2. Section 3 presents an evolutionary perspective on financial systems based on complex systems theory. This notion will be used as reference in the following discussions. Section 4 examines the question whether financing patterns matter for the categorization of financial systems, as the evolutionary perspective suggests. Section 5 discusses the issue of convergence of financial systems with special reference to recent developments in Europe. Section 6 concludes the paper.

2. Differences in financial systems: bank-based and market-based systems

The most popular classification differentiates between two prototypes of financial systems, the “market-based system” and “bank-based system” (e.g. Gerschenkron 1962, Rybczinski 1984, Dosi 1990). In the last years the issue of corporate governance became the focal point of the literature (Franks and Mayer 1995, Berglöf 1997). The classification of systems is made on the basis of the relative importance of banks and markets for corporate financing. The distinction is based on the basic dichotomy between two general forms of finance – arm’s length and control oriented finance (Berglöf 1997). Table 1 displays the ramifications of the dominant form for finance on the financial system.

Table 1: The dichotomy of financial systems and ownership governance

Type of system	market-oriented system	Bank-oriented system
Financial markets	Large, highly liquid	Small, less liquid
Share of firms listed on stock exchanges	Large	Small
Risk-sharing	Market: Cross-sectional	Banks: intertemporal
Ownership and control	Dispersed	Concentrated
Way of influence	Exit	Voice
Market of corporate control	Hostile takeover frequent	Hostile takeover rare
Dominant Agency conflict	Shareholders vs. management	Controlling vs. minority shareholders
Role of banks in external finance	Small	Very large
Debt/Equity ratio	Low	High

2.1 Market-based systems

Arm's length finance promotes dispersed ownership of debt and equity, and therefore liquid markets for financial instruments. With thick and liquid markets investors are portfolio-oriented and the relationship between financiers and firms is short-term oriented and akin to spot transactions: exit is the primary mechanism of influence and corporate control. In a stylized representation of the market-based system stock markets, equity issues and bonds and retained profits are the dominant forms of investment finance, while bank loans serve typically a short-term smoothing purpose. Under this system a large number of liquid and thick financial markets provide wide-ranging financial instruments. Monitoring functions are provided by different specialized institutions such as commercial banks, investment banks, rating agencies and venture capitalists. The most prominent examples of market-oriented systems are the financial systems of the United States and the United Kingdom.

2.2 Bank-based systems

Financial systems dominated by control-oriented finance promote more concentrated ownership structures and less liquid financial markets. The relationship between financiers and enterprises is long term and based on ongoing exchanges of information, meeting and advice. The repeated and long term relationship reduces informational asymmetries and agency costs. In a stylized credit-based system, long-term bank loans and long-term ownership titles by banks are the dominant forms of investment finance. The monitoring functions are integrated in a single institution (bank) which is involved in all three monitoring stages: selection of clients and investment projects, monitoring of the projects on an ongoing basis and interventions in the case of poor performance. The Japanese main bank system and German house bank system are the most important examples for bank-based systems.

2.3 Relative strengths and weaknesses

The market-based system is much more dependent on well defined property rights and a high quality of legal enforcement (take-over code, insider trade restrictions, strict disclosure rules) than bank-based systems. This explains why many developing countries or transition economies have no other choice than to adopt a bank-based system (Rajan and Zingales 1998). Bank-based systems are good at reducing agency and monitoring costs which may have an influence on the cost of capital (see Hoshi et al. 1991, McCauley and Zimmer 1989) while in market-based systems fund-raising may be very costly for firms facing strong informational asymmetries (Myers and Majluf 1984, Fazzari et al. 1988). Therefore one might argue that financing in a bank-based system is close to internal funds for firms. Internal financing has the double-edged properties as the 'free cash flow' thesis proposed by Jensen (1986) suggests. Jensen argues that the accumulation of internal funds is necessary if the firm is

subject to severe financing constraints, on the other hand if firms have more internally generated funds than positive net present value investment opportunities these funds might be nevertheless invested by managers leading to excessive and unproductive investments. The same scenario is possible in bank-based systems if the close relationship between banks and firms reduces the cost of capital considerably, while internal agency costs and informational asymmetries may still exist. The pursuit of growth leads to overinvestment. As the interest of the bank is primarily relationship-related, the budget constraint in bank-based systems may be softer than in market-based systems. Bank-based systems encourage long-term and relationship specific investments, while short-termism was identified to be a problem in the market-based systems (e.g. Lazonick and O'Sullivan, 2000). The threat of replacement causes managers to look for quick fixes to keep shareholders satisfied. This may have negative effects on innovation (e.g. Krafft and Ravix 2003) and investment (e.g. Stockhammer 2004) and in general reduce the incentive to invest in relationship specific capital.

It is often argued that market-based systems that rely on exit mechanisms, e.g. hostile takeovers make the correction of the misuse of funds less and the allocation of funds to promising investment projects more likely. However the empirical evidence suggests that takeovers fail as disciplining device for managers (e.g. Franks and Mayer 1996, Goldstein 2000). In regard to radical change this suggests that with disruptive technological change and new high-risk investment opportunities market-based system will outperform bank-based systems, while bank-based systems may be good at traditional industries where production technology is relatively stable and innovation based on incremental learning (e.g. Mayer 1998, 2001). Market systems are more efficient to cope with the diversity of opinion and therefore at exchanging risks at a given point in time which promotes flexibility. This flexibility comes with a cost. Allen and Gale (1997, 2000) suggest that intermediary-based economies are more efficient in sharing intertemporal risks of asset price swings than market-based economies.

2.4 The Limitations of the Dichotomy

The discussion of financial systems is mainly focused on the dichotomy between market-based systems of the Anglo-Saxon countries and the bank-based systems of Japan and Germany. For the real world such a dichotomy of financial systems is much too simple as (i) there may be more than two ideal types and (ii) that in practice the two types coexist in the same country.

The first critique of the dichotomy is directed towards the assumption that there are two 'ideal type' configurations of financial systems. As remarked by a number of observers it looks as if Japan, Germany, the UK and US seem to be the exception, as most financial systems across the world are neither bank-based nor market based. Cobham and Serres (2000) indicate the French financial system

was never a truly bank-based system nor that it converged towards the market-based system as argued by Betero (1994). This system was and remained significantly different from both the Anglo-Saxon and the Japanese system. Until 1986 France was largely a bank based system with strong government influence and a fragmented banking system. The financing patterns reveal that bank finance is important in France but with a declining trend. Bank finance is an important means of finance but they never did exert the kind of control that banks in Germany or Japan are known for. French banks hold virtually no stake in non-financial companies. Equity and bond finance are more important in France than in the US or the UK, but the stock market did not provide the kind of corporate control known from Anglo-American systems. This seems to suggest that France might in some intermediate position between bank-based and market-based (high internal finance) systems. But the differences are significant, the financial sector is quite fragmented and corporate control cannot be classified neither as bank-based nor as market-based. In France firm managers retain much greater control over the business firm and can act relatively independent from both financial markets and financial institutions. The mode of corporate governance is business-based, as it is cross-shareholding between firms and the concentration of ownership which ensured good governance. Almost the same is true for Italy (Cobham et al. 1999, Barca and Trento 1997), where the state had a dominant role and the governance of firms in the private sector was based on pyramidal groups, family and coalition control. Bank finance is important but banks are not active monitors. The bipolar, one-dimensional emphasis in the debate about financial systems may be incomplete as most developed and developing countries may be much closer to the French and Italian case (Cobham and Serres 2000).

The second critique concerns the fact that in the real world a sharp dichotomy of financial systems is not to be found and that the classification is much too simple. In practice the two types of financial system can coexist in the same country, although the relative importance may be different across countries. Petersen and Rajan (1994) have shown that bank financing prevails also in the US for small enterprises and that most firms have one bank. For the European countries it has been shown that smaller firms do rely more on bank finance than larger ones and the ratio net equity to financial resources is smaller than for large firms (Debreil et al. 2000). Another example is provided by venture capital. The venture capital industry is most developed in the United States where it is specialized in financing high-risk, but potentially high reward projects. Venture capital is a hybrid form of a financial system, as it is a variant of relationship-based financing (Gompers 1998) insofar as it relies on close monitoring mechanisms and venture capitalists have strong control rights in order to mitigate problems of asymmetric information. In this respect it is close to the bank-based system. On the other hand venture capital requires thick equity markets where successful venture capitalists can cash in their investments. Such capital markets strongly depend on a well-functioning market-based system. Black and Gilson (1998) have shown that venture capital funds in Germany and even in the UK are

different from the US in several ways, e.g. only a small part of the funds goes to start-ups or high-technology-related investments. The differences do not only depend on the existence of appropriate large and thick equity markets but also on traditions such as the landscape of scientific research institutions which are difficult to put in place in other countries as they are embedded in the institutional structure of the economy (e.g. Giesecke 2000).

Both critiques show the limitations of a crude classification of financial systems in a bipolar dichotomy which distinguishes between two types of financial systems. This suggests that the dichotomy should be broken up in order to allow for additional 'ideal types' of financial systems.ⁱ

3. An evolutionary perspective on financial systems

The notion of financial system used in this paper is wider than usually in the literature. The financial system is understood as the interaction system of supply of and demand for financial services. The financial system is the set of different institutions such as banks, capital markets and other financial institutions which provide financing to the industry and provide liquidity to savers. Financing and saving decisions themselves are part of the system. The environment of the financial system are the system of law, product and labor markets as well as the relevant political and other economic institutions. The financial system is therefore one of the primary and outstanding examples for a complex institution governing the transfer of information, the set up of incentives, and resource allocation mechanisms.

The services provided by the financial system in an economy are by no means simple. The most elementary role of the financial system plays is the facilitation of trade. The existence of the financial system is connected to the existence of money. Functioning financial systems guarantee (i) the proper working of the payment system, (ii) the mobilization and pooling of savings and (iv) the allocation of funds among competing uses. The financial system allocates liquidity to borrowers and aids to transform savings into investment, thereby (v) reducing risks as the evaluation and monitoring of investment projects is centralized and savings are distributed across a number of different investment opportunities. The monitoring of borrowers by the financial system establishes (vi) the system of corporate control which provides mechanisms for disciplining borrowers and managers.

3.1 The evolutionary perspective: complementarity and fit of systems

Financial systems are “functioning” when they contribute to the economic well-being of the countries. This points towards a systemic view on financial systems, as each of those national systems has its own checks and balances, conflicts, strengths and weaknesses but is consistent in its own

configuration of financing patterns, corporate governance and the financial sector. Shleifer and Vishny (1997) argued that functioning financial systems provide a combination of large investors (when necessary) and a legal system that protects investor rights. In the following we present an evolutionary view on financial systems which builds on the work of Aoki (1990) and Hackethal and Schmidt (2000) and uses the notions of complementarity.ⁱⁱ

Complementarity is an attribute of elements of a given system (network, production process or financial system) and arises if single elements of the systems interact in such a way to influence the overall performance of the system. A good example is provided by the personal computer: The choice of best components (CPU, motherboard, graphic card, software) does not necessarily imply that this PC is better than all the others, indeed it might even not work if the 'best' CPU cannot be put on the "best" motherboard. This shows also that complementarity is deeply connected to the concept of linkages and interfaces, with an adapter it might be possible to put the CPU on the motherboard.

Stuart Kauffman's (1993) NK-model of complex biological organism is a particularly rich model for representing complex systems, as it provides a straight forward way of thinking about interrelationships complementarily in systems (see the appendix for more detail on the model). The N - K model simulates the evolution of complex systems in which the elements function interdependently. A system is described by a set of N elements each of which can take on A_i possible values. The number of all possible strings among system elements is called the possibility space of a system. For a binary system consisting of four elements ($N = 4$; $A_i = 2$) the possibility space is equal to $S = 2^4 = 16$. There are 16 possible constellations or types. Each element makes a contribution to the fitness of the type. If the system is complementary then the fitness of the type depends on the contribution of the other element contributions. K denotes how interdependent the characteristics are in determining the fitness contribution. Two extreme cases can be contrasted: on the one extreme we have $K=0$, we have minimum complexity since each element's fitness contribution is independent of all others and at the other extreme, if $K=N-1$ we have maximum complexity as each element's fitness contribution depends on all other elements. It can be shown that the number of local optima increases rapidly when the interdependence parameter is tuned from $K=0$ to $K=N-1$ (Kauffman 1993). Complex systems with high interdependence parameters are characterized by a rugged fitness landscape and characterize the existence of trade-offs between the functioning of different elements. The workability of a system is dependent on the fact that the different elements fit together: A system is said to be consistent if its complementary elements take on values which make the system attain an optimum. This needs not to be a global optimum, as systems with complementary elements have usually more than one optimum.

3.2 The financial system in an evolutionary perspective

Now we use this model (metaphor) to define financial systems. As the knowledge on interactions and causation of single components is not enough developed in order to specify in a rigorous way the specific elements of systems, we use a preliminary and ad hoc definition in order to describe financial systems. The definition used follows closely the seminal one provided by Hackethal and Schmidt (2000). The financial system is defined as ordered set of four components (which can be themselves complex systems):

The Patterns of industrial finance, that is the way how firms finance their investments. How investment is financed is where do corporations obtain the finance they need for making real investment. If regularities within countries exist we can speak of nationally specific patterns of industrial finance. And if they exist, these patterns constitute a essential element of the financial system of a country. The patterns of financing patterns can be classified in binary way as bank based or as market based.

The corporate governance system which we define in a holistic way as the totality of the institutional and organizational mechanisms and corresponding decision making to resolve conflicts of interest between the different groups which have a stake in a firm. Corporate control refers to the ability of groups to determine broad corporate objectives, that is to make decisions over strategic issues regarding the long run success or failure of the firm and the distribution of the surplus.ⁱⁱⁱ The distinction between insider systems of corporate governance and outsider systems of corporate governance provides an useful distinction (Franks and Mayer 1995). Outsider Systems are the market-based systems as the UK and the US characterized by a large number of listed companies, low levels of ownership concentration and few interlocking shareholdings. Insider systems, as the economies of Continental Europe and Japan have few listed companies, high levels of concentration of ownership and a high proportion of cross-shareholding between firms and/or institutions.

The financial sector itself, which consists of financial markets and institutions (banks, insurance companies) and exhibits a certain structural features and is shaped by regulatory practices and legal rules. The structure of the financial sector is defined by the importance of capital markets, the prevalence of universal or specialized banks and the relative importance of non-bank financial institutions.

The predominant system of business co-ordination and organization, that is the prevailing corporate structures, relationships between firms, employers and employees and strategies, which in turn is related to company law. It is often argued that the business co-ordination bank-based systems is much

more organizational (voice-mechanism) than in market-based systems where the market (exit-mechanism) provides the dominant form of co-ordination. There can be identified two broad corporate law traditions in Europe: A company-oriented legal system associated with the UK and a enterprise-oriented legal system associated with the German and French legal tradition. In the company-oriented legal system the firm is identified with the legal entity and the relationship between it and its investors, while the enterprise-oriented system takes a broader view and includes the role of stakeholders and places greater emphasis on the physical identity of the firm (Wymeersch, 1994).

3.4 Implications

What are the implications of complementarity for financial systems? Let us consider two instances of a financial system consisting of the four subsystems outlined (a, b, c, d). Let each of the 4 different elements take two values B and M for bank-based system and market-based system and define two systems $FS_M = (a_M, b_M, c_M, d_M)$ and $FS_B = (a_B, b_B, c_B, d_B)$ which consist only of elements with values M and B respectively. Furthermore, assume for convenience that there are the only two local optima: the bank-based system (bank based industrial finance, insider system of corporate governance, enterprise law, bank-based financial sector) and the market-based system (market based industrial finance, outsider system of corporate governance, company law, market based financial sector). Those types are consistent configurations.^{iv} The other 14 intermediate financial systems are not local optima. Their performance can be made better by changing one of the four elements. Let us define two other systems $FS_{M'} = (a_M, b_M, c_B, d_M)$ and $FS_{B'} = (a_B, b_B, c_M, d_B)$ which differ from FS_M and FS_B insofar that one element has been changed. Then it must hold if the system is one of full complementarity that

FS_M is better than $FS_{M'}$

FS_B is better than $FS_{B'}$,

even if it is common knowledge that c_M is better than c_B , and irrespective of whether FS_M is better or worse than FS_B . This stems from the definition of the complementary relation between elements and implies that “pure” systems have a better fit than “impure” systems since they are coherent. This illustrates the aspect of path-dependency arising through interdependencies. There is no way to reach for a higher peak without going down from a local optimum (and changing the whole system). The different institutions, organizations, rules and conventions of the financial systems constitute a grown set of ordering principles. This has implications for the management of changes in the system. As efficiency needs to be evaluated in the context of the system, centralized and concentrated decision making is necessary to increase the efficiency of the system. Changes pursued by agents which have (i) only influence on the characteristic of one element or, (ii) no understanding of the working of the system, or (iii) which can only induce small changes will most likely fail to converge to optimal results (Milgrom and Roberts, 1995).

It is useful to regard financial systems as evolving complexities, whose form can be different across time and space. Their specific form is determined by economic, political and cultural institutions. These institutions are carriers of history (David, 1994). Complementarity and path dependency are closely related concepts. Complementarity leads to path dependency as dynamic attribute of complex systems.^v There is no way from a local optimum towards a better optimum without going down from an hill. This implies that a certain systemic selection bias is at work when individual mechanisms and arrangements are chosen. This is especially true when one considers the fact that many of the characteristics are not predetermined rules of the game (law or formal conventions) but ones can be selected by the agents playing the game (discrete decisions, informal conventions, contracts). The latter can be interpreted as 'ways playing the game' (Nelson 2002).

4. The relevance of financing patterns

The systemic perspective proposed states that the patterns of industrial finance are complementary to the other sub-systems in the financial system. However, in recent years the distinction of financial systems based on corporate financing patterns was questioned on the basis of empirical research. Colin Mayer (1988) proposed a new methodology of measuring how investment is financed. He and others who followed his line of research (Betero 1994, Edwards and Fischer 1994, Corbett and Jenkinson 1997) found that financing patterns are quite similar across countries.

The methodology proposed by Mayer draws on flow-of funds data. Flow-of-funds data is more reliable, better comparable across countries and more comprehensive than stock data, as it is less susceptible to differences in national accounting rules and conventions, and collected in a way which is largely comparable across countries. Moreover, flow-of-fund data cover all firms in an economy. The methodology proposed by Mayer focuses on the net contribution of different sources of funds to financing the investments in a particular period of time. As in each period the sources of funds must be equal to the uses of funds – it is possible to establish how investment in physical assets was financed. Table 2 presents a overview on the results compiled from a number of studies. The findings suggest that the systems appear to have many features in common. Internal finance is the single most important source of financing and debt finance the most important source of external finance. The contribution of the equity is of limited importance also especially in the market-based countries (US and UK), and interestingly equity finance is much more important in the Italy and France. However, Italy and France cannot be classified neither as bank-based nor as market-based system. On the basis of this data it seems to be wrong to classify the USA as a market-based system. The US are much more like a fully internally financed economy. And in respect to bank-based systems, Germany seems

not to have bank-based financing patterns. Bank finance appears to be more important in the UK and almost equally important in US. Moreover, financing patterns seem not to be particularly stable over time.

Table 2 Patterns of Net Sources of Finance, 1985-1994

(in percent of physical investment)

	USA	UK	Japan	Germany	Italy	France
1985-89						
Internal finance	103.7	81.0	70.7	89.1		84.7
Bank finance	15.0	29.9	23.1	9.3		30.3
Bonds	24.8	8.8	8.6	0.4		1.4
Equity ^c	-29.6	-20.6	4.4	2.4		6.9
Trade credit	-4.7	-0.6	-5.7	-1.8		-2.9
Capital transfers	-	0.4	-	8.4		3.9
Others ^b	1.8	-0.8	1.1	-7.9		-22.1
Residual	-11.0	-1.8	-	-		-2.3
1990-1994						
Internal finance	109.8	81.2	71.2	71.8	83.7 ^a	92.1
Bank finance	-4.5	0.2	19.5	16.9	20.9 ^a	22.8
Bonds	10.4	6.3	2.1	-2.8	-6.4 ^a	5.6
Equity ^c	-4.2	12.4	3.1	-3.1	4.7 ^a	2.1
Trade credit	1.4	1.0	0.9	2.1	-6.5 ^a	-3.4
Capital transfers	-	-0.4	-	9.6	-	6.9
Others ^b	-6.1	8.7	3.3	-0.9	3.6 ^a	-24.7
Residual	-6.8	-9.4	-	6.3	-	-1.4

Notes: ^(a)1983-1993. ^(b)France: Reserves techniques d'assurance - reserves constituted by firms against future pension provisions and other kinds of insurance plus all others liquid claims issued by firms, mainly non-transferable deposits ^(c)Net equity financing = issues - acquisitions of equity. Sources: Corbett and Jenkinson (1997), Cobham and Serre (2000) and Cobham, Cosci and Mattesini (1999).

On the basis of this findings the distinction between market-based systems and bank-based systems has been challenged, as financing patterns seem not to differ in a significant way between countries. It was argued that corporate governance should provide the basis for the classification of financial systems. But interestingly the proposed new taxonomy of insider vs. outsider financial systems groups countries more or less in the same way as the old taxonomy of market-based and bank-based systems. This raises the question whether financing pattern are really divorced from control mechanisms. This would suggest that the financial system are not systems with maximum complexity as regards the four elements presented. Financing patterns would be independent from the other elements.

Hackethal and Schmidt (1999) argued that the results obtained by the net financing methodology do not reflect the institutional structure of the economies. The essential point of their criticism concerns

the implicit assumption behind the netting procedure, that funds from the same category are used in the first place to pay back liabilities in the same category. This would imply that the financing of investment is only a secondary use of external funds. When this assumption is made clear, it becomes clear why internal financing must be the most important means of financing investment. There exists no corresponding 'primary use'. Internal financing is a residual. With the double netting procedure the time-horizon of external financing is lost, i.e. long term credits are treated like short term credits. With this also the institutional differences of the financial system are lost. Investment must in the last instance be covered by internally generated funds, otherwise the debt of non-financial corporations would have to grow without limit. Hackethal and Schmidt (1999) suggest that it is misleading to look at net financing patterns and suggest that gross financing patterns distilled from flow of fund data are more useful indicators for identifying financing patterns.

Table 3: Patterns of external gross financing by sector
(in % of total long-term external finance)

	USA	Japan	Germany
1985-1989			
Banks	46	91	82
NBFI	41	6	13
Households	7	2	4
RoW/Government	6	0	2
1990-1966			
Banks	36	83	92
NBFI	49	11	6
Households	9	4	1
RoW/Government	6	3	1

Notes: NBFI: non-bank financial intermediaries, RoW: Rest of the World. Source: Hackethal and Schmidt (1999): 15.

Their results (Tables 3 and 4) show that gross patterns of external finance differ very much between the US on the one hand and Germany and Japan on the other hand. The difference is most pronounced for bank finance. The procedure suggested by Hackethal and Schmidt yields results which are consistent with the maximum complexity assumption and with the distinction of bank-based and market-based financial systems. They rehabilitate empirically the view that financing patterns are important determinants of the form of financial systems.

Table 4. Long-term external finance in international comparison, 1970-1994
(in % of long-term external finance)

	USA	Japan	Germany
Banks	44	82	93
NBFI	42	12	5
Households	9	4	2
RoW/Government	4	2	1
<i>in form of securities</i>	<i>45</i>	<i>12</i>	<i>13</i>

Notes: NBFI: non-bank financial intermediaries, RoW: Rest of the World. Source: Hackethal und Schmidt (1999):15

5. The convergence of financial systems

The discussion on the convergence of financial systems is closely related to the idea of a best financial system. According to a naive (evolutionary) view of convergence based on the principle of the “survival of the fittest”, one should not worry about institutional reforms, since in the long run international competition would force firms to minimize costs. As part of cost minimization to adopt rules to raise external capital at the lowest cost. This perspective depicts institutional competition as if it were product-market competition and is closely related to the Chicago School of law and economics (Bratton and McCahery 2002). The financial system is regarded to be a system with minimum complexity and structural interdependencies do play no role. Competition is assumed to ensure that all financial systems would converge to the most efficient system. Some commentators argue that the market-based system occupies a higher evolutionary plateau and is intrinsically superior to the bank-based system (Easterbrook 1997, Hansmann and Kraakman 2002). However, even casual evidence suggests that the chances, that developing and transition countries could easily come to resemble either a fully fledged bank-based or market-based system, are small.

The identification of a best system is a difficult task. Formal reform of company law will not do it, as the experiences of Germany and Japan after the World War II suggest. In Japan, there minority share holder protection and an act similar the Glass-Steagall act were introduced in order to weaken the power of cross-holdings and banks. However, these laws were undermined and replaced by the institutions of stable corss-holdings and cross-directorships. Also in Germany the introduction of a US-style CG was resisted after World War II. Only in the last decade the resistance in both countries diminished. However, also the preferences change from time to time. In the 80s and 90s the idea that the bank-based system are more conducive to economic growth was dominant (e.g. Porter 1992). In

the last years it has been argued that the market-based system is better for economic growth (e.g. Rajan und Zingales 2000, Holmström and Kaplan 2001). There is something to the view that the performance of a financial system depends on the ‘stability’ of the environment. A market-based system is better at funding high risk projects which arise when there is rapid change in technology or market environments, while bank based systems performs better in a more ‘static’ environment characterized by gradual and incremental change and innovation. The basis for this perspective is the flexibility of market-based systems and the trust-based interaction in bank-based systems. Market-based systems have advantages when radical structural changes emerge, which are fueled by deregulation and radical technological change. These changes are well mediated by markets. Bank-based systems with their corporatist structure are less prone to facilitate fast changes in firm strategies (e.g. Dosi 1990, Hackethal and Schmidt 2000). Carlin and Mayer (2003) suggest that not the level of activity is influenced by the financial system but the composition of economic activity. Different types of financial systems are suited for different types of activities (Dosi 1990).

5.1 System dynamics and processes of change

The change of financial systems is no easy task. The complexity of the assignment suggests a sequential change of the characteristics of the single elements. However, with complex interdependent systems this is likely to lead to inconsistencies and to temporary reductions of efficiency. The latter creates a pressure to return to a consistent system.

Here expectations mediated by and created within the economic context of the system play a central role. For the functioning of every financial system it is of importance that at least some expectations are reciprocal. In a world of incomplete contracts reciprocal expectations make contracts implicitly more comprehensive. On this basis, Hackethal and Schmidt (2000) devise two potential scenarios of system dynamics. The first is what I call the *institutional ossification* scenario, where stabilizing effects are dominant and the system tends back to its original configuration. The second scenario is called *system crisis*. Here radical changes of the financial system are possible.

The institutional ossification scenario is related to the thesis of institutional sclerosis emphasized by Mancur Olson, where in rent-seeking special interest group behavior becomes an accepted institution in society. And indeed a central element in Bebhuck and Roe’s (1999) theory of path dependence of financial systems is to rent-seeking by controlling owners, managers and labor. In the present context the stabilizing effects derive from the structural interdependencies of the system. These stabilizing tendencies are reinforced by the expectations mediated by the behavioral and institutional context of the financial system. This suggests endogenous dynamics to force the system back to the original

configuration. The implication of institutional ossification perspective is that that relatively inefficient systems (which have to be local optima) may survive for a long time, at least as long until the social costs of the change of the configuration are lower than short term efficiency gains. Roe (2002) seems to come close to such an perspective in his discussion on the political roots of the separation of ownership and control.

The second scenario is the *systemic crisis*. In this scenario the inconsistencies within the system become that large, that the stability of expectations is undermined. The expectations are no longer congruent. Fundamental uncertainty overrides the stabilizing tendencies. Within the scenario of system crisis the radical change of the constellation of a complex system becomes much more likely. In respect to system crises market- and bank-based systems are not neutral. The interdependent structure of decision making in bank-based systems suggests that this kind of system is much more dependent on the consistency and coordination of expectations than the market-based financial systems. In this context even a convergence towards a less efficient but more stable system may be a possible outcome. Let us assume - for the sake of exposition - that the bank-oriented system is more efficient than the market-based system. Let us further assume that the market-based system is more stable than the bank-based systems. This assumption can be defended on the basis that the functioning of bank-based systems relies much more than the market-based systems on common institutions which create mutually consistent expectations e.g. in the capital-labor relations, in the relationships between banks and firms, of managers and the board, supplier relations. The formation of mutually consistent expectations depends crucially on a large number of learning processes which require time, stability and shared context. It becomes clear, that if a system crisis emerges, that the winner may not be the most 'efficient' system but the more stable one. This is related to fact, explored in N-K-models, that systems with lower complexity have evolutionary advantage in respect to high-complexity system, as they are more likely to end up in an global optimum (Kaufman 1993, Altenberg 1995).

5.2 Towards global shareholder capitalism?

La Porta et al. (1997, 1998) have provided an important approach to the analysis of the relationship between laws financing arrangements, ownership patterns and economic growth. The lesson from their work is that that the protection for outside investors in interaction with agency problems determines ownership structures and argue that the protection of minority is a central variable for explaining both corporate behavior and economic growth. From a non-systemic point of view this would imply the policy recommendation that the rights of minority shareholder and creditors should be strengthened to make the control of corporations more efficient and foster economic growth. As Berglöf (1997) indicates this would involve the need to change the basic legal system. Given the path dependent

nature of the law (e.g. Teubner, 1989, Hataway 2000) this is a complex task. The clustering and apparent complementarity between different features of financial and legal systems has the important implication for public policy that institutional reform is likely to be very complicated. In a systemic perspective these different elements interact and give rise to path dependence as a dynamic property of the system. The presence of functional complementarity between elements and the associated need for systematic consistency of the whole system predicts that it would not make much sense to mix systems and combine elements which appear to be particularly valuable in particular systems to create an overall optimal system. This suggests that institutional reform is likely to be complicated and the efforts to harmonize institutions across countries may be counterproductive (Bratton and McCahery, 2002).

The initiatives to harmonize the structure and control of corporations on a European Union level were not successful, as they aimed towards a “middle of the road” system that could be easily adopted by all member countries. But even if the EU has substantially altered the economic institutions of its member states it has been unable to harmonize European company law and corporate standards and structures. To date, these have met with limited success in particular in relation to corporate governance and the takeover directive – despite of more than 25 years of effort (e.g. Hopt 2002). The debate on corporate governance has led to more consciousness about its relevance. However, this has not led to fundamental changes yet. While corporate and capital market laws see some convergence, the financial and legal systems are still heterogeneous.

As the legal and financial system are closely interrelated of crucial importance for investment and economic growth this suggests that reforms of financial systems should remain a national issue (Berlöf 1997). Reform would require fundamental changes in both legal and economic systems which would be a quite risky task. The national histories are path-dependent and open-ended, and rest on a number of country specific structures and traditions, as well as expectations. Path dependency implies that changes are slow and predictable.

But capitalism is a dynamic process and restlessly undergoing changes. Changes in the technology translate in changes in the organization of production, forms of competition and supporting institutions. This implies limits for a crude and static systemic view on financial systems. Such an approach cannot provide nothing more than a functionalist re-construction. The *institutional ossification perspective* cannot account for the determinants of ongoing changes which may result in system crises and for the nature of capitalist societies characterized by structural change.

Everywhere tendencies can be identified which seem to indicate that the market-based and bank-based systems are dissolving. In the US the Glass-Steagall-Act which separated banking and brokerage and which was according to Roe (1994) important for the development of the US financial system has been abolished. American banks seem to be converging to the universal banking model exemplified by Germany. In Germany Vodafone acquired Mannesmann through a hostile takeover which is typical for outsider control systems. In Japan - which since years suffers a economic crisis which is according many commentators a crisis of the financial system - there are clear indications of the demise of the Kereitsus and the decline of the main bank system. In the US proponents of a blockholder system ask for deregulation of controls on institutional investors, looking to encourage large shareholdings and more effective monitoring. In Europe stronger security regulations looking to encourage deeper trading markets are implemented. Financial liberalization and deregulation has taken place in many countries over the past two decades (Edey and Hviding 1995). For example, Japan has removed both process restrictions that inhibited shareholders actions and legal restrictions on share issuance that prevented issuers from including stock options in management compensation arrangements. This has undoubtedly changed the character of financial systems in many countries. Schaberg (1999) argues that there has been a shift in towards market-based financial systems as many countries are rewriting their corporate laws and reviewing the requirements for firms to be listed on exchanges. The privatization of state enterprises in Europe created thick financial markets in many countries where before there were none. Both the aggregate market capitalization of stock exchanges and the average market capitalization increased remarkably from 1990 to 1999, as depicted in table 5.

Table 5 Stock market growth 1990-1999

	Growth of the number of stock exchange listed companies	Growth of the average market capitalization of listed companies	Stock market capitalization to GDP	
			1985	1999
US NYSE	48.3%	189.6%	(USA)	(USA)
US Nasdaq	24.6%	991.4%	57%	181.1%
U.K.	17.8%	196.3%	77%	198.0%
Japan	16.3%	27.0%	91%	102.5%
Germany	90.3%	112.6%	29%	68.1%
Italy	-3.9%	411.2%	14%	62.4%
France	118.5%	121.5%	15%	105.3%
Spain	67.4%	132.0%	12%	72.6%
Belgium	-23.1%	272.3%	26%	75.4%
Netherlands	5.0%	455.0%	47%	177.3%

Source: van der Elst (2000)

One of the most important tendencies which can be identified is the emergence of the “new” institutions of mutual and pension funds which hold now a broad fraction of equity. Table 6 gives a overview over changes in ownership structures in the four main world economies. One can clearly see

that investment and pension funds increased their ownership shares on the expense of cross-shareholdings between non-financial firms. These institutions are active shareholders in that they perform a function of allocating capital among industries and firms in a decisively market-based manner. They impose profitability norms to enterprise and are short-term profit oriented which stands in contrast to the traditional relationship-oriented orientation of banks in bank-based systems. These institutional investors exert their power on the management by exit strategies, any negative assessment of a firm results in a movement away from its stock. This would create difficulties for the firm to obtain new financing. First, pension funds were an US phenomena but these international, primarily US, institutional investors are increasing their presence in also foreign (European) enterprises and are beginning to question incumbent management.^{vi} Their arrival has unleashed competition for global saving among recipient countries in Europe. However, with the privatization experiment investment funds were set up by banks in Europe, in order to provide new products targeted to savers. More important seems to be the reform of the pension systems in Europe where pay-as-you-go systems are under pressure to be reformed into more 'market-based' pensions systems. The pension system is complementary to the financial system (i) as it channels a large amount of savings and its institutions play a central role in the corporate governance (especially pension funds that are shareholder value oriented) and (ii) as it provides incentives to employees whether to invest in firm-specific human capital or to invest in more general human capital. The pension system is an important element in the context of the financial system and at the same time a central element of the financial system. Thus the convergence process within Europe towards a more market-based system may not be the result of concentrated action of the European countries in order to introduce a 'best' system to foster industrial success, but the result of (unintended) consequences to reduce public debt and fight demographic changes by privatization of public services, especially the pension system.

Table 6: Ownership structures of quoted companies 1990 – 1998

	USA		UK		Japan		Germany	
	1990	1998	1990	1997	1990	1999	1990	1998
Non-financial sector								
Individuals	50.8%	41.9%	20.3%	16.5%	20.5%	19.0%	16.9%	15.0%
Companies	0.0%	0.0%	2.8%	1.2%	29.5%	24.6%	41.6%	30.5%
Public Authorities	0.0%	0.0%	2.0%	0.1%	0.2%	0.2%	3.6%	1.9%
Financial Sector								
Banks	5.4%	3.4%	0.7%	0.1%	23.2%	22.6%	10.3%	10.3%
Insurance companies	5.0%	6.0%	20.4%	23.5%	15.7%	14.1%	11.2%	13.7%
Pension funds	24.2%	24.0%	31.6%	22.1%	0.9%	4.7%	-	-
Investment funds	7.1%	16.3%	7.7%	10.6%	3.7%	1.6%	4.3%	12.9%
Foreign	7.5%	8.4%	14.5%	25.9%	6.3%	13.2%	12.1%	15.7%

Source: van der Elst (2000)

7. Concluding remarks

This paper provided a critical discussion of recent developments in the literature on financial systems. An evolutionary perspective on financial systems was proposed and used to organize the discussion. The complementarity of elements provides at the same time framework for the reconstruction of past financial systems and to think about changes in financial systems. The close relationship of financial systems, legal systems and political traditions, as well as the number of organized interests suggest that stabilizing tendencies are quite strong. In short, path dependence makes full structural convergence a highly unlikely prospect. Path dependency is a strong force determining the development of new institutions and practices. However, tendencies of institutional system crisis are visible suggesting structural change. Deregulation and the tendencies of financial globalization weaken especially the stability of the bank-based systems. The resulting inconsistencies lead to a pressure of adaptation towards a ‘new’ coherent systems. However, strong path dependency suggests that there will be – at least in the foreseeable future – a number of different capitalisms with in detail different institutional configurations, conflicts and contradictions. In order to substantiate this prediction an explicit multilevel theory of institutions which takes into account the interdependencies of the national institution of the financial system and the economic institution of the firm is required (Pelikan 2003). In the present context the NK-methaphor is essentially static. To make the model dynamic a microeconomic underpinning is needed that takes into account the dynamics at the microlevel explicitly. However, the evolutionary perspective on financial systems presented in this paper provides a first step towards an institutionally and historically contingent analysis. A fully operational concept of financial systems requires beside microeconomic, systemic and institutional foundations an explicit monetary foundation. A macroeconomic monetary foundation is necessary in order to assess hierarchies of complementarity relations, to rehabilitate financing patterns as fundamental determinant of the form of financial systems on a theoretical basis and to provide a more structural interference into determinants and tendencies of structural change in financial systems.

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ⁱ This can be readily integrated in the systemic view presented below. In systems with four binary elements and ($N=4$ $K=N-1$ $A_i=2$) there is a high probability that three local equilibria exist (see also the appendix).

ⁱⁱ For more on complementarity see Milgrom and Roberts (1990, 1995), for the NK-model used as conceptual framework see Kauffman (1993), Levinthal (1997) and Marengo et al. (1999).

ⁱⁱⁱ This entails a more encompassing definition of corporate governance. Usually corporate governance is defined as the ways in which suppliers of finance to enterprises assure themselves of getting a return on their investment (Shleifer and Vishny, 1997).

^{iv} In systems with complementarity with multiple local equilibria it needs not to be the case that every consistent type has high fitness. However, each „good“ type must be consistent.

^v Note that path dependence in this context is not related to some „small events in history“ but generated by the interdependencies within the system.

^{vi} American equity holdings abroad increased between 1990 and 1997 from \$ 110 billion to \$600 billion. In the assets of global and international funds rose from \$28 billion to more than \$300 billion (Useem 1998).

Appendix: The NK-model

The NK-model presents a mathematical metaphor to think about complementarity. The values of loci characterising a type can vary from 0 to 1. The design of a financial system is described by a string of loci which refer to the set of components that make up the financial system. The variable N refers to the number of elements. For each element there are A_i possible variants. In the binary case the variants can be labelled “0” and “1”. The size of the possibility space indicates how many variants (types) can possibly exist. In the case of a binary system with 4 elements the possibility space can be represented graphically by a “cube within a cube”. The K-value refers to the number of interdependent relations between elements. Regarding the internal structure two limit cases can be distinguished. The first case concerns systems of minimum complexity ($K=0$). Maximum complexity ($K=N-1$) indicates the case where the functioning of each element depends on its own state and the state of all other elements.

*** insert figure A1 ****

Figure A1 depicts the case of minimum complexity. The functioning of the single elements is independent of all other components. Following Kauffman (1993), the fitness values of the components are drawn from a uniform distribution between 0 and 1. The fitness of the system as a whole is calculated as the mean value of the fitness values of the components. Figure A1 lists a simulation. The distribution of fitness values for all possible types is called the fitness landscape of a system. If we consider a search by changing one component (one-bit mutation). The system converges to its global optimum (here string 1101). This holds for each type, as there exists at least one neighboring type which has higher fitness (except of course for the optimum itself). Any series of random mutations will lead to the optimal system.

*** insert figure A.2 ****

Figure A2 depicts the case of maximum complexity, where the functioning of elements depends upon all other elements ($K=N-1$). The fitness contribution of each element is dependent upon all states of all other elements. To illustrate this case, the values of the fitness contributions have to be randomly drawn for each possible type separately. Maximum complexity usually contains local optima since the elements function differently in each type. Figure A.2. lists a simulation. The possibility space contains three local optima: 1000, 0010 and 1111. Type 1111 is the global optimum. For all three strings it holds that there is a lock in regard to the one-bit mutation strategy. In which local optimum one gets locked up depends on the starting point. Note that the 1111 has a small basin of attraction.

Figure A1: Minimum Complexity: The fitness landscape of a N=4-system (K=0)

Combination	f_1	f_2	f_3	f_4	$F=\sum f_i/N$
0000	0,3	0,5	0,5	0,4	0,425
0001	0,3	0,5	0,5	0,8	0,525
0010	0,3	0,5	0,3	0,4	0,375
0011	0,3	0,5	0,3	0,8	0,475
0100	0,3	0,8	0,5	0,4	0,5
0101	0,3	0,8	0,5	0,8	0,6
0110	0,3	0,8	0,3	0,4	0,45
0111	0,3	0,8	0,3	0,8	0,55
1000	0,3	0,5	0,5	0,4	0,425
1001	0,7	0,5	0,5	0,8	0,625
1010	0,7	0,5	0,3	0,4	0,475
1011	0,7	0,5	0,3	0,8	0,575
1100	0,7	0,8	0,5	0,4	0,6
1101	0,7	0,8	0,5	0,8	* 0,7
1110	0,7	0,8	0,3	0,4	0,55
1111	0,7	0,8	0,3	0,8	0,65

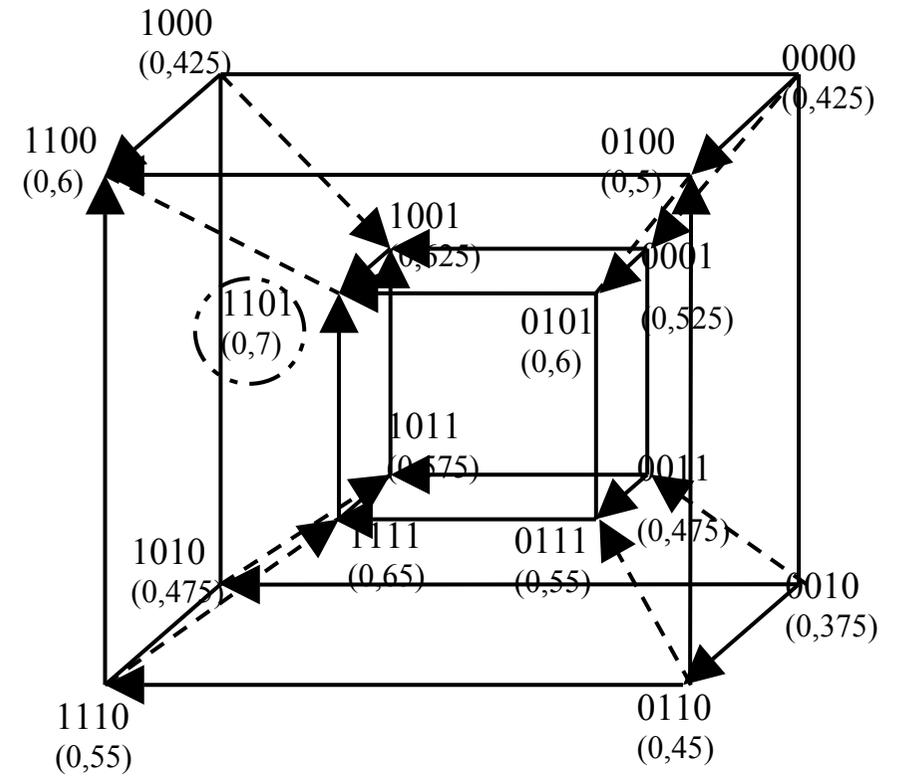


Figure A2: Maximum Complexity: The fitness landscape of a N=4-system (K=3)

Combination	f_1	f_2	f_3	f_4	$F = \sum f_i / N$
0000	0,2	0,5	0,7	0,8	0,55
0001	0,3	0,6	0,5	0,4	0,45
0010	0,6	0,9	0,8	0,7	* 0,75
0011	0,4	0,5	0,3	0,5	0,425
0100	0,2	0,8	0,2	0,4	0,4
0101	0,4	0,8	0,4	0,8	0,6
0110	0,5	0,8	0,1	0,4	0,45
0111	0,2	0,1	0,2	0,2	0,175
1000	0,8	0,6	0,9	0,7	* 0,75
1001	0,5	0,9	0,3	0,5	0,55
1010	0,2	0,1	0,7	0,7	0,425
1011	0,4	0,2	0,3	0,6	0,375
1100	0,1	0,7	0,5	0,9	0,55
1101	0,6	0,1	0,2	0,4	0,325
1110	0,5	0,2	0,2	0,9	0,45
1111	0,7	0,9	0,9	0,8	* 0,825

