JOHANN WOLFGANG GOETHE-UNIVERSITÄT
FRANKFURT AM MAIN

FACHBEREICH WIRTSCHAFTSWISSENSCHAFTEN

Marcel Tyrell/Reinhard H. Schmidt

**Pension Systems and Financial Systems in Europe:
A Comparison from the Point of View of Complementarity**

**No. 65a
July 2001**

WORKING PAPER SERIES: FINANCE & ACCOUNTING

Marcel Tyrell/Reinhard H. Schmidt*

Pension Systems and Financial Systems in Europe: A Comparison from the Point of View of Complementarity

No. 65a**

February 2001, rev. July 2001

University of Frankfurt

ISSN 1434-3401

* Marcel Tyrell was a Research Associate under the DFG project "The Convergence of Financial Systems in Europe" at the Department of Finance of the Goethe University of Frankfurt/M. and is now a lecturer at the University of Trier. Reinhard H. Schmidt is a Professor of International Banking and Finance in the Department of Finance of the Goethe University of Frankfurt/M. Address: Mertonstr. 17, 60054 Frankfurt/Main, Germany; tel. +49 (0)69-79828269; fax +49 (0)69-79828272; e-mail: tyrell@wiwi.uni-frankfurt.de and rschmidt @wiwi.uni-frankfurt.de

** Working Paper 65 is the earlier German version of the present paper. A shorter version of this has been published in *Private Versicherung und Soziale Sicherung*, Festschrift zum 60 Geburtstag von Roland Eisen, hrsg. von H-C Mager, H. Schäfer und K. Schrüfer, Marburg: Metropolis-Verlag, 2001.

Abstract

At present, the question of how national pension or retirement payment systems should be organised is being hotly debated in various countries, and opinions vary widely as to what should be regarded as the optimal design for such systems. It appears to the authors of the present paper that in this entire discussion one aspect is largely overlooked: What relationships exist between the pension system and the financial system in a given country? As such relationships might prove to be important, the present paper investigates the following questions:

(1) Are there differences between the national pension systems of three major European countries – Germany, France and the U.K. – and between the financial systems of these countries?

(2) And if the existence of such differences can be demonstrated, is there a correspondence between the differences with respect to the various national pension systems and the differences as regards the countries' financial systems?

(3) And if such a correspondence exists, is there any kind of interrelationship between the national financial and pension systems of the individual countries which goes beyond a mere correspondence?

Looking mainly at two aspects – namely, risk allocation and the incentives to create human capital – the authors of this paper argue

(1) that there are indeed considerable differences between the financial and pension systems of the three countries;

(2) that in both Germany and the U.K. there are also systematic correspondences between the respective pension systems and financial systems and their economic characteristics, but that such a correspondence cannot be identified in the case of France; and

(3) that these parallels are, in the final analysis, based on complementarities and are therefore likely to contribute to the efficiency of the German and the British systems.

The paper concludes with a brief look at policy implications which the existence of, or the lack of, consistency between national pension systems and national financial systems might have.

Keywords: Financial system, pension system, risk allocation, human capital formation

JEL classification: G10, G34, H55, P51

1. Problem Definition: The Complementarity of Pension Systems and Financial Systems

The design of national pension or retirement payment systems is one of today's most hotly debated issues in virtually all of the highly developed industrialised countries.[1] This is evidenced not only by the numerous reform proposals but also by the difficulties that have emerged when countries have tried to redesign their pension systems, a prime example of which can be seen in the evolution of the most recent pension reform in Germany.[2] There are several reasons for the high level of public interest in this subject. For one thing, the shift in the demographic structure caused by falling birth rates has led to a crisis of the pension schemes that are financed on a pay-as-you-go basis. Contributions to pension insurance are rising, and the burden on future generations, we are told, will become increasingly heavy. For another, the advocates of funded pension systems argue that this approach, even allowing for the risk components, generates a higher yield on the invested contributions and promotes the formation of real capital.[3] Thus, converting to this type of system would reduce the burdens and spread them more equitably between the generations.

It appears to us that in this discussion one aspect is largely overlooked: the relationship between the characteristics of the national financial systems and those of the respective national pension systems.[4] Discussions about the advantages and disadvantages of various pension systems, and about the problems entailed in designing such systems, are always shaped by the context in which they take place, and the respective financial system – or, to be more precise, the other elements of the respective financial system apart from the pension system, which is itself a component of the financial system – is probably the most

[1] Orszag/Stiglitz (1999), Diamond (2000) and Feldstein (1998) represent different standpoints in the international discussion. See, with regard to Germany, the special-topic issue "Rentenreform" (Pension reform) of the journal *Perspektiven der Wirtschaftspolitik* with contributions by Homburg (2000), Breyer (2000), Schmähl (2000), Börsch-Supan (2000) and Thum/von Weizsäcker (2000), and also the contributions by Atkinson (1999), Sinn (1999) and Wagner (1999) to the 1998 annual conference of the Verein für Socialpolitik, whose main topic was the future of the welfare state. This topic is also the subject of controversy in France and the U.K. On the discussion in France, see Blanchet/Legros (2000), and in Britain, Tonks (1999), Clark (2000a) and Williamson (2000).

[2] On this subject, see in particular Rürup (2001).

[3] See, for example, Börsch-Supan (1998), Feldstein (1998) and Siebert (1998) as advocates of a conversion to a retirement payment system based largely on funded pension schemes, and also Sinn (2000) and Breyer (2001), who present the opposite case.

[4] Although it can be shown, on the basis of various contributions to the Bundesbank conference on "Ageing, Financial Markets and Monetary Policy" in the spring of 2001, that the existence of such a relationship has been recognised in the academic discourse on the design of retirement payment systems, discussion of this relationship has been – bar a very few exceptions, such as Davis (1995) and Clark (2000b) – narrowly focused on the capital market. Aside from the aforementioned exceptions, there has been virtually no analysis of the relationship between pension system and financial system.

important aspect of that context. The specific context that we have made the subject of this paper relates to the following questions:

(1) whether there are differences between the financial systems and the pension systems in various European countries;
(2) if this is the case, whether there is a correspondence between the differences as regards various national pension systems and the differences with respect to the countries' financial systems;
(3) and if such a correspondence can be demonstrated, whether there is an interrelationship between each country's financial system, narrowly defined, and its pension system which goes beyond a mere correspondence.

At first sight, searching for such differences and parallels might appear to be a purely theoretical endeavour whose only purpose is to satisfy academic curiosity. But can it perhaps also yield insights that are of practical relevance? Our cautious answer is: Yes, because of the complementarity of the elements of the overall system comprising the pension system and the other parts of the respective national financial system, and because of the possible consistency of these elements, or of the overall system. This assessment is based on the notion that complementarity and consistency are very important characteristics of a broadly defined financial system, characteristics which impact on the functionality and stability of the financial system over time and likewise on the functionality and stability of its parts, including the pension system. Insights into the extent to which the financial system and the pension system influence each other allow us to draw at least tentative conclusions about the necessity and feasibility of changing them.

In the next section we briefly outline the differences between three major European economies – Germany, France and the United Kingdom – as regards both their financial systems and their pension systems, and highlight the ways in which the differences between the national pension systems mirror the differences between the countries' overall financial systems. In sections 3 and 4 we discuss important ways in which the pension system and the respective financial system influence each other. The subject of section 3 is the connection between the design of the statutory pension system and risk allocation in a given economy, while section 4 considers the role played by the design of company pension schemes in corporate operations, corporate finance and corporate governance. Taken together, sections 2 – 4 are intended to provide sufficient evidence to support our assertion that there is a relationship of complementarity – and, in two of the three cases, one of consistency a well – between the national financial system and the national pension system, at least to the extent that it permits us to outline, in the concluding section (5), the implications which this relationship is likely to have for the development of the systems.

2. Core Characteristics of the Financial Systems and Pension Systems

2.1. National Financial Systems and How They Differ

a) Definition of Terms and Classifications

It is advisable to differentiate between the narrowly defined concept of the financial sector and the broadly defined concept of the financial system.[5] In a sectoral perspective, the financial sector is that part of the economy which offers the other sectors opportunities to invest and obtain financing, together with associated advisory and intermediation services. Its principal constituent elements are banks, other financial intermediaries and organised financial markets (in particular securities exchanges). In contrast, the financial system, according to the intentionally broad definition of this concept which we have adopted, includes not only the financial sector but also the entire spectrum of options available to the non-financial sectors to accumulate assets and undertake intertemporal transfers of income, to procure and deploy funds for investments and to manage the risks entailed therein, and also the rules and regulations which affect these processes (and their potential). This definition is intended to emphasise that the financial system encompasses the totality of financial transactions and also the informational relationships and the relationships by which influence is brought to bear in a country's economy, and that it not only consists of the financial sector, which constitutes the supply side of the market for financial services, but also the demand side. The demand for the services of the financial sector comes from households, which accumulate wealth, and from firms, which need capital in order to invest. However, the financial system also includes the non-financial sectors of the economy, not only in so far as they make use of the services of the financial sector, but also in so far as they *do not demand*, or *do not succeed in obtaining*, its services. Indeed, if we wish to properly describe a financial system, we must also indicate the extent to which firms, as investors and deficit units, obtain financing directly from households and other surplus units or engage in self-financing in the broad sense, and the extent to which households accumulate wealth by undertaking real investments and take measures to insure themselves against risks. In addition to the financial sector, corporate finance and the accumulation of wealth by households, the analysis of financial systems should also take account of corporate control (corporate governance) and corporate strategies.[6] It goes without saying that the state is also a part of the financial system – not only because it both supplies and demands financial services, but also because it serves as the organiser and regulator of the financial system. Here, however, we have intentionally refrained from enumerating all of the relevant elements and aspects in order to avoid unnecessarily encumbering our presentation, and in many other instances throughout the following discussion we will also opt for brevity so as to not obscure the essential points we are making.

[5] For a discussion of these concepts, see Schmidt/Tyrell (1997) and Hackethal/Schmidt (2000a).

[6] For a more detailed examination of this aspect, see Hackethal/Schmidt (2000a).

On the basis of these broad definitions, pension systems are also an important part of financial systems, regardless of whether they are rooted in a country's (institutional) financial sector or not.

Our definition of the financial system emphasises the system aspect: the various elements of a system must fit together if the system as a whole is to "work". Given that the usual classification of financial systems into two groups – those which are bank-dominated and those which are capital market-dominated – cannot be applied directly to corporate governance systems, an analogous distinction is made here between insider and outsider systems.[7] In an "insider control system", the activities of a company are guided, and its management is monitored, largely on the basis of mechanisms which presuppose that there are actors with a privileged position in terms of their access to information and their ability to exert influence – i.e. insiders, who are familiar with, and perhaps personally involved in, the company's activities, but who are not themselves decision-makers within the company.

In an "outsider control system" the activities of a company are in essence guided by external market mechanisms. This presupposes that the persons who act in the markets, and who, through their behaviour there, influence companies and monitor their management, maintain arm's-length relationships with companies, are not privileged in terms of their access to information and do not exert any direct personal influence on the affairs of companies, and thus may be regarded as "outsiders".

As regards financial system typology, the generally accepted view is that the financial systems of Germany and Japan are bank-dominated – and that the French system also fell into this category prior to the mid-1980s – whereas the systems of the United States and the U.K. are capital market-dominated. As regards the manner in which control is exercised, Germany and Japan – and probably this still also applies to France – rely on the insider system, whereas the U.S. and the U.K. have outsider systems. However, one should be wary of overly "neat" classifications, which, furthermore, overlook changes over time. In the following discussion, the financial systems of Germany, the U.K. and France are briefly characterised without explicitly taking pension systems into account.[8] In section 2.2. the three national pension systems will then be outlined.

b) The German Financial System

At present, the core elements of the financial system in Germany can be characterised as follows:

Financial sector

1. Banks, and universal banks in particular, dominate the financial sector.

[7] See Franks/Mayer (1994). This classification is discussed in greater detail in section 4.3.

[8] For a more detailed description and an empirically based analysis of the financial systems in these countries, see Schmidt/Hackethal/Tyrell (2002) and the studies summarised therein.

2. Non-bank financial institutions that are independent of banks – especially pension funds and unit trusts – play only a minor role.
3. The stock market is still relatively underdeveloped by comparison with other industrialised countries.
4. When accumulating financial assets, households rely mainly on investment options offered by banks and/or insurance companies.

Financing patterns

5. External financing of small and medium-sized enterprises is provided primarily in the form of long-term bank loans; "house bank" relationships obtain.
6. Pension reserves continue to be an important source of internal financing.

Corporate governance

7. There are extensive cross-shareholdings among companies, and complex group structures.
8. The public limited company is not the dominant legal form among corporations.
9. Most firms listed on the stock exchange are characterised by concentrated shareholder structures.
10. Aside from the shareholders, other stakeholders such as banks and employees play a role in corporate governance.
11. Long-term and implicit contracts between the stakeholders create commitments and stable relationships, and form the basis for corporate control.
12. External control via the capital market (takeover market) is virtually non-existent.
13. Firm-specific investments by the stakeholders (e.g. investments in human capital by the employees and relationship loans made by the banks) are encouraged by the "obligation to reach agreement" which exists as a consequence of the evenly balanced distribution of power among the insiders.

The elements outlined above are complementary,[9] and in the case of the German financial system they are also largely consistent: the dominance of banks in the financial sector is reflected both in corporate financing patterns and in the dominant mode of corporate governance. A key difference between banks and capital markets lies in the way in which they process information.[10] Whereas capital markets externalise information via the price mechanism, thereby making this information public, banks are characterised by the fact that they internalise relevant information and are thus in a position to provide financing, even in "difficult cases" that are characterised by highly asymmetric information. This is why in Germany relationships between firms and financial intermediaries are often close, long-term and, by international standards, not very transparent. The fact that nearly all German banks are universal banks is also an advantage in terms of overcoming

[9] For a detailed discussion of the complementarity of elements of a financial system, see Hackethal/Schmidt (2000a).

[10] For a detailed assessment of this aspect, see Tyrell (2001).

information asymmetries. The breadth of their relationships with firms enables them to more effectively manage the risks arising out of long-term credit relationships with companies and out of the contracts, some of them implicit, associated with those relationships. The predominate form of corporate control in Germany is based on consensus not so much *despite*, but rather *because of*, the many conflicts which are unavoidable in a stakeholder system, and in practice this system makes it easier for the banks to assess and manage such risks and incorporates the employees and the trade unions into a system in which the individual components are dependent on one another. This arrangement is stabilised by the fact that each group of stakeholders (shareholders, employees, banks, managers) has the power to negotiate, which creates an implicit "obligation to reach agreement".

A functioning and active market for corporate control would not fit into this picture. The stakeholders would necessarily fear that the implicit contracts might be broken by the new owners, which would reduce the incentives to make firm-specific investments. The German capital market continues to be regarded as "underdeveloped", not least of all because share ownership remains concentrated in the hands of people and institutions with close ties to the companies in which they have acquired equity stakes. This means that the degree to which information is externalised is low, so that insiders have advantages over outsiders, and especially over non-institutional (small) shareholders.

c) The British Financial System

In nearly all respects, the situation in the U.K. is the opposite of what one finds in Germany:

Financial sector

1. Not commercial banks but NBFIs (unit trusts and pension funds) dominate the financial sector.
2. The stock market is highly developed.
3. The accumulation of financial assets by households occurs mainly through investments in the capital market, either directly, or indirectly via pension funds and unit trusts.

Financing patterns

4. External corporate financing occurs to a large extent through the capital market, either directly or indirectly.
5. By and large, bank credit tends to be short-term and is provided "at arm's length"; it does not entitle or enable the lender to exert influence over the borrower, and is based on a more limited exchange of information than is usual in Germany.
6. As a consequence of the large volumes of capital which they have at their disposal, pension funds are an important source of external financing for companies.

Corporate governance

7. The public limited company is the dominant legal form among corporations.
8. Cross-shareholdings between companies are rare, and not very extensive; group structures are transparent and not very complex.
9. The shares of companies listed on the stock exchange are mainly held by small shareholders.
10. Corporate control is exercised via market mechanisms (takeover market) and is oriented towards shareholder value (outsider system).
11. Relationships to non-shareholding stakeholders are mostly governed by explicit contracts and on the basis of market mechanisms, and tend to be short-term in nature. This reduces the incentive for employees to invest in firm-specific human capital, but it does permit a significantly higher degree of flexibility.

The British system, viewed as a totality, can also be interpreted as a consistent system of complementary elements: the relationships between firms and financial intermediaries tend to be at arm's length, short term, and largely transparent. Neither corporate finance nor corporate governance is dominated by banks; instead, market mechanisms, which rely on the externalisation of information, play a major role in shaping the relationships between the stakeholders. In such a configuration, the importance of economies of scope for banks declines in so far as the acquisition and utilisation of firm-specific information is concerned, and, as a result, the organisational form of a "universal bank" appears less advantageous. On the contrary, in order to survive in the face of stiff competition from highly specialised NBFIs, British banks need to specialise to a greater degree than German banks. The relationships of most banks with their corporate clients focus on short-term lending and transaction services. However, this deprives the banks of an important foundation on which to build long-term customer relationships, which consequently remain at arm's length for the most part. This is also reflected in corporate financing patterns and in the mode of corporate governance. Indeed outsiders – and above all the managers of large pension funds and unit trusts – have far more influence over corporate management at the average British firm than they do in Germany. Maximisation of shareholder value is perceived as the exclusive objective of the firm. This principle, however, tends to undermine the effectiveness of mechanisms which managements may use to try to ensure that other stakeholders develop, or maintain, a commitment to firms. The danger that the management or their "principals", i.e. the owners (who may change), may try to take unfair advantage of other stakeholders at a later date therefore reduces the incentive to undertake firm-specific investments; or, to put it another way, a very one-sided and very strong orientation towards the market value of a firms' shares is quite compatible with a low level of commitment on the part of the company's other stakeholders. In place of implicit contracts there are explicit contracts combined with market mechanisms, and in place of a "voice" through which their interests are represented, the stakeholders have the option of

"exiting".[11] Well functioning external labour markets take the place of co-determination within firms as a means of protecting employees' interests.

The other side of this coin is that firms can generally respond more flexibly to changes in their environment, yet at the same time have to accept the disadvantage that they will be less able to differentiate themselves on the basis of firm-specific resources. Given that banks play only a secondary role in corporate finance, there is also less incentive for them to come to the aid of a firm that is experiencing a liquidity squeeze.

The existence of such trade-offs, which are typical of systems with complementary elements, means that, based on our analysis, we will not be able to say that one of the two systems – the U.K.-style market-oriented financial system or the German-style bank-oriented financial system – is "better", i.e. is more advantageous in general terms.

d) The French Financial System

The French financial system cannot be classified as unambiguously as that of Germany or the U.K., especially given the substantial changes it has undergone in the last 20 years.[12] In the past, i.e. until approximately 1986, France had a system based on a highly fragmented banking sector whose essential character was determined by the state's desire to control the financial life of the country and by the nature of the activities it undertook to ensure that the workings of the financial economy served its interests as it defined them. A considerable proportion of all external corporate finance – nearly 50 percent at the start of the '80s – took the form of credit provided at subsidised interest rates, with the Caisse de dépots et consignation, the Banque de France and the Treasury forming the core elements of the intermediation system. The capital markets were almost exclusively oriented towards meeting the financing needs of the state, and were therefore of little relevance as a source of corporate finance. De facto, there was no clearly defined mode of corporate governance. Rather, the instruments that might have served to protect the interests of both insiders and other outsiders were rendered ineffective – and supplanted – by the influence of the state. In this sense, it was legitimate at the start of the '80s to speak of a French "third way".[13]

The new banking law of 1984 and the deregulation and opening of the money and capital markets in 1985/86 (*"le petit bang"*) were ultimately precipitated by the government's intention to make public sector borrowing easier. As a consequence, the (big) banks

[11] For a discussion of the application of this terminology and classification ("voice vs. exit") – which was developed by Albert Hirschmann – in this context, see the recent study by Mann (2002).

[12] For a comprehensive overview of the French financial system, see Faugère/Voisin (1994), Bertero (1994) und Plihon (1998).

[13] The same conclusion is also reached by Walter (1993, p. 24): *"The French financial and industrial systems have traditionally been dominated by the strong influence of central government."* In a series of publications, Pastré shows how persistent this dominance of the state over the financial sector and even the entire financial system has proved to be; see in particular Pastré (1992), (1998).

declined in significance as financial intermediaries, a development which was offset by a major increase in the importance of the capital markets. Nonetheless, complex group structures persist. Although they are gradually being dissolved now, the *"noyeaux durs"* of (indirect) state holdings that had evolved in the course of privatisation, and the interlocking directorates that had existed for decades, remain important to this day. Corporate control is not very transparent, and the dominant figure in the prevailing governance system is clearly the chief executive officer who is, in most cases, also the chairman of the board (PDG). A French PDG enjoys far-reaching powers and can exercise them virtually without checks and balances. In this respect, French corporate governance is still an insider system, even though the influence of foreign institutional investors has in the meantime led to improvements in the *gouvernement d'entreprise* and made it more transparent. Relationships with the various groups of stakeholders are still largely shaped by long-term contracts, some of which are implicit in nature.

It is hardly surprising that changes in the structures of the financial sector and corporate governance have been accompanied by changes in the subsystem "corporate finance". Increasing *désintermédiation* and *marchéisation* (securitisation) since the mid-1980s have caused non-bank financial intermediaries and the capital market to gain in significance as a source of corporate finance and of investment options for households. Thus, insurance companies, unit trusts and money market funds are becoming increasingly important as sources of finance and as providers of investment vehicles, but money market funds in particular are seldom independent of the banks in institutional terms. The banks may still be involved in the cross-shareholdings that interlink firms, but they no longer play a dominant role in the financing process or in corporate control.[14] Corporate financing tends to be short-term and "at arm's length"; so far, pension funds and pension reserves have not played a major role here.[15]

At first glance the French system would appear to be in the process of shifting from the German type to the Anglo-Saxon type. However, the new structure that has emerged from the changes that have taken place over the last few years is still far from consistent – in many cases, the elements of the system do not fit together (yet). The observed instability of several elements of the French financial sector is a sign of functionality problems and thus indirectly of inconsistencies. The element that used to define the character of the entire financial system, and which linked its various components and thus also ensured that the system remained workable, was the strong position of the state and the elites that were closely associated with it. This element has largely disappeared. The controlling function of the state – which tended to be exercised either directly or via the banks – has not been assumed by another power centre located within the state apparatus or in close proximity to it. Moreover, the old principle of statist control of the financial system and the form of

14 This characterisation of financing relationships in France is necessarily very brief; for a more extensive treatment of this topic, see also the monthly report of the Deutsche Bundesbank for October 1999 (Monatsbericht Oktober 1999).

15 For a detailed discussion of this point, see Deutsche Bundesbank (1999).

complementarity and consistency which characterised the system during the statist period have not been replaced by a new *"logique"*.

e) Summary and Conclusions

This brief comparison of the financial systems of Germany, the U.K. and France, which for lack of space necessarily leaves aside many aspects, in particular the saving and investment behaviour of households, reveals considerable differences between the financial systems of these three large European economies. Essentially, the overall structure of the financial system in Germany has been very stable and that of the U.K. has been largely stable, whereas the overall structure of the financial system in France has changed dramatically over the past 20 years. From this it follows that the respective overall structures of the German and British financial systems are no less clearly different from one another today than they were 20 years ago. Thus, these two systems are not converging. In Germany the bank-dominated, insider-controlled system with long-term, partly implicit contracts still prevails, whereas in the U.K. the more "adversarial", capital market-oriented, outsider-controlled system with short-term, mainly explicit contracts dominates.[16]

In France the new structure which has emerged from the changes of recent years is still far from being stable; some of the component elements of the system *no longer* fit together, others *do not yet* fit together, and it is questionable whether they might ever fit together. To sum up: it is fair to say that in France much has become "anglicised", but that so far this has not given rise to a consistent system of the Anglo-Saxon type.

2.2. National Pension Systems and How They Differ

a) Definition of Terms and Classifications

A pension system, or what Americans would refer to as a "social security system", is a system for providing in advance for income in the period after people's working lives have come to an end. It encompasses the main sources of this income and their significance, as well as the various rules, arrangements and institutions that are relevant to the provision of pensions. Most pension systems comprise three so-called pillars or subsystems: the state pension system, which may take the form of an insurance system or a system for providing a basic pension financed with tax revenues; company pension schemes; and the measures taken by individuals and households on their own to create a source of retirement income. Pension systems differ from one another in terms of the relative importance of these three subsystems and also – and this is the aspect on which we will focus in this paper – in terms

[16] However, recently there have been certain developments in Germany which would seem to indicate that the very large multinationals are instituting changes in their financing patterns and control structures which amount to a shift towards the Anglo-American model. For a more detailed assessment, see Mann (2002) and Schmidt/Hackethal/Tyrell (2002).

of their design, especially as regards the state (statutory) pension systems and company pension schemes.

There are two kinds of state/statutory pension systems: pay-as-you-go systems and funded systems.[17] In a pay-as-you-go system, at a given point in time income is provided to the retirement-age population in the form of transfers from the generation that is currently working. The contributions paid in by the economically active population are disbursed to the current generation of pensioners. A characteristic of this procedure is that at no time do the institutions which operate the system hold a sizeable volume of assets. Any transfer system has to be designed in such a way that it induces the providers of the transfers to participate. The mechanism for achieving this may be a generally recognised social norm, or direct state coercion, or the promise of payments of at least equal magnitude in return, or any combination of the three. In a funded pension system, by contrast, the income a person receives in old age takes the form of a repayment, with interest, of savings invested in the capital market which that person accumulated during his or her working life**.** This investment may be organised and effected via the state, via parafiscal institutions or via private-sector financial institutions. However, if the last of these three alternatives is selected, compliance with the private contracts must be assured, with legal force or the coercive power of the state being used, if necessary, to enforce such compliance.

The basic alternatives for the design of company pension schemes can be characterised as follows: either the funds are left within the company and the employees who are entitled to receive pensions become (long-term) creditors of the company; or the funds are invested outside the firm, in which case the employees covered by the pension scheme become creditors (or co-owners) of a pension fund or a retirement fund. Within each of these two basic categories, a further distinction may be made: company pension schemes may either provide employees a certain predetermined level of retirement income ("defined benefits") or require that they make payments of a certain predetermined size during their working lives ("defined contributions").

b) The German Pension System

In Germany, the relative importance of the three "pillars" is roughly as follows:[18] The strongest pillar is the statutory pension insurance system, which provides for generous benefits compared to those paid by the statutory pension systems in many other countries. The size of payments received after retirement is based on the amount which people pay in during their working lives in the form of compulsory contributions that are set on the basis of their specific income levels, and the system is financed on a pay-as-you-go basis.

[17] For a more detailed comparison of these two ways of organising pension systems, see Breyer (2000).

[18] The following discussion of the German pension system draws on material presented in Börsch-Supan/Schnabel (1997), Davis (1995, 1999) and Arbeitskreis "Finanzierung" der Schmalenbach-Gesellschaft für Betriebswirtschaft e. V. (1998).

Together with civil servants' pensions and the supplementary pension funds for public-sector employees, this pillar accounts for nearly 85% of the income of the average pensioner household. In addition, there are company pension schemes most of which are financed through pension reserves retained within companies. In 1997 such schemes accounted for approximately 5% of the income of the average pensioner household. Thus, given the shares of average retirement income contributed by statutory and company pensions, and in view of the fact that most company schemes are based on internal reserves, so far very little pension-related accumulation of assets has taken place via the capital market. If one includes private life insurance policies as a form of retirement provision, then this source supplies the remaining 10% of the total volume of payments to pensioners. By the very nature of things, any distinction that one might make between private retirement provision and other forms of private wealth accumulation is necessarily arbitrary. Yet, a considerable portion of private households' total saving takes the form of investment in non-monetary assets (in particular, residential real estate), and thus, even if one assumes that some of the wealth accumulated for other purposes is also eventually used as a source of retirement income, the – mediated or direct – accumulation of financial assets "in the capital market" is still probably of only limited importance.

In the past, pension reserves were an important source of corporate finance, especially for Germany's large enterprises. By 1995 the volume of pension reserves had grown to almost DM 280 billion.[19] A comprehensive analysis of the financing structures of German firms that was carried out by the Bundesbank found that at big companies with more than 2000 employees, pension accruals were equivalent to just under half of these firms' own funds.[20] At DM 123 billion, the volume of new pension reserves created between 1982 and 1993 was roughly on a par with the volume of shares issued by German firms during the same period.[21]

c) The British Pension System

Compared with Germany, state pension insurance in Britain is much less generous, whereas company pensions and private provision for retirement play a much larger role. State pensions comprise a tax-financed basic pension which is not a function of income earned during the beneficiaries' working lives and is rather meagre, and a State Earnings Related Pension Scheme (SERPS), which is financed on a pay-as-you-go basis by contributions from wage and salary earners, employers and the self-employed. The basic pension currently works out to 16% of the average monthly income of all male employed people, but according to recent calculations it may even fall to only 7–8% by 2030 in real terms as a consequence of being indexed to retail prices.[22] The supplementary SERPS

[19] See Arbeitskreis "Fnanzierung" der Schmalenbach-Gesellschaft für Betriebswirtschaft e. V. (1998).

[20] See Deutsche Bundesbank (1999).

[21] See Nürk/Schrader (1995).

[22] On the following figures, see Blundell/Johnson (1997).

pension is supposed to be equivalent to 20% of a worker's average income, assuming it exceeds a certain minimum earnings level (if it does not, then the SERPS pension is supposed to be equivalent to 20% of this minimum amount) However, people can opt out of this system and, as a substitute for participation in the compulsory insurance system, join a company pension scheme or set up a personal insurance plan, which then becomes a compulsory private pension scheme. 75% of the British labour force choose this option. Roughly two thirds of the people who have opted out of SERPS have joined company pension funds and the other third have insured themselves on an individual basis, which creates a flow of funds into the capital market.[23] The funds paid into voluntary company pension schemes are also usually invested in the capital market, given that in most cases the firms that operate (or "sponsor") the schemes transfer the funds that are accumulated in the form of contributions to an external pension fund.

Britain's state pay-as-you-go system provides only rudimentary, basic cover, with funded systems – i.e. arrangements involving the investment of contributions in the capital market, either directly or indirectly – providing the lion's share of all income received by the country's pensioners. It is therefore not surprising that insurance companies and pension funds play an extremely important role as financial intermediaries and also in the British capital market.

d) The French Pension System

The French pension system is dominated by the generous state pension insurance scheme, the Régime Général de la Sécurité Sociale, which operates on a pay-as-you-go basis, and a compulsory additional pension scheme, the Régime Complémentaire, which provides a form of insurance that must be taken out by employers for the benefit of their employees. It is financed with contributions from both the employers and the employees, also on a pay-as-you-go basis, and could thus be described as a type of company pension.[24] But unlike company pension schemes in Germany, the Régime Complémentaire is a compulsory insurance system, with contributions being paid into funds which cover specific occupational groups, regions or industries and which are organised under two apex bodies, the Association des Régimes de Retraites Complémentaires (ARCO) and the Association Générale des Institutions de Retraites Complémentaires (AGIRC). The associations, which comprise a total of 180 individual funds, ensure that resources are transferred among their member organisations to even out any financial imbalances between "rich" and "poor" funds, and they support the "régime general" with their surpluses. Responsibility for administering the funds, which are closely monitored by the relevant government ministry, is shared equally by employers and trade unions. Thus, in France company pension schemes are so closely linked to the state pension insurance system that, de facto, they may

[23] On this point, see also Davis (1995).

[24] For a more detailed presentation of the material covered by the following brief discussion, see in particular Blanchet/Pelé (1999) and Blanchet/Legros (2000).

be regarded as a component of that system; genuinely independent company pension plans are practically non-existent.[25]

Viewed as a whole, pension provision in France is very generous. Pensions are equivalent to roughly 80% of the average employee's earnings, with the share rising to 100% of workers' income in certain low-paid occupations, and almost the entire system is financed on a pay-as-you-go basis.[26] However, private provision for retirement through investments in unit trusts and insurance policies has increased markedly in recent years – due not least to the fact that the French pension system is bound to experience major financial problems in the not-too-distant future, which has created considerable uncertainty regarding its long-term viability.

e) Summary and Conclusions

If one makes the simplifying and idealising assumptions that are usually made in economic analyses (and which of course are in no sense "realistic"), and if one thereby eliminates the redistributive component that undoubtedly exists, de facto, in all real pension systems, then the idea which first comes to mind is that the specific design selected for a pension system may be irrelevant. If employees themselves have to take (greater) responsibility for providing for their own retirement income, they will demand and, under equilibrium conditions, also receive, higher wages. If companies pay funds into pension funds, they will borrow equivalent amounts from the financial sector to replace these funds if they need them for investments. If households are forced, through withheld portions of wages or payments into a pension fund, etc., to reduce their disposable income in the present in order to increase it in the future, they will make the necessary adjustments to their consumption and savings patterns. In an Arrow-Debreu world, in which the entire future – i.e. all potential outcomes – can be accurately depicted in market prices today, in which there are no financing restrictions and in which individuals take account of the welfare of future generations, the so-called Ricardian equivalence would obtain at the macroeconomic level: the manner in which the pension system is financed would be irrelevant.[27]

In view of the necessary offsetting reactions, i.e. adjustments, that are induced by the necessity of making payments into pension systems and to fund investment in some way, it would be inappropriate to judge the effects ascribed to what seem, prima facie, to be widely differing pension schemes, exclusively on the basis of their direct effects as reflected in payment flows. A meaningful basis for comparison and assessment can only be created by looking at the direct effects together with the indirect effects, i.e. the offsetting reactions (adjustments) which are prompted by the imperfections in the specific markets into which the pension systems are integrated. This is discussed in the following sections: the first step will be to investigate the extent to which each of the pension systems, in its

[25] See Davis (1995) and Friderichs/Paranque/Sauvé (1999).

[26] See Blanchet/Pelé (1999).

[27] See Barro (1974).

ideal-typical form, is able to reduce certain primarily macroeconomic or aggregated risks stemming from market imperfections, while the second examines the systems from a microeconomic perspective.

3. Statutory Pension Systems and Risk Allocation

3.1. Intratemporal versus Intertemporal Risk Sharing

The allocation of risk in an economy is shaped by numerous market mechanisms and institutions. Indeed, risk allocation is one of the main functions of financial intermediaries and capital markets, and thus also of pension systems. Different institutions each have their own comparative advantages when managing, i.e. reducing and efficiently allocating, specific risks. A crucial distinction in this context is the one introduced into the discussion by Allen/Gale, which distinguishes between, on the one hand, risks which relate to a specific point in time, such as those which are the focus of models used in financial theory (e.g. the CAPM), i.e. intratemporal risks, and so-called intertemporal risks on the other.[28] The latter type of risks can result, for example, from macroeconomic developments, such as the oil price shock in the early 1970s, the stock market crash of 1989 or the dramatic fall of all asset prices, and especially of the prices of shares and real estate, that has been under way in Japan since the beginning of the ’90s. In all of these cases there were pronounced, long-lasting and highly correlated changes in the prices of most assets, including market-traded assets, which meant that investors were unable to effectively offset the resulting non-diversifiable risks.

The quoted papers by Allen/Gale investigate the extent to which various financial institutions, such as financial intermediaries and capital markets, are capable of offsetting time-specific or intratemporal risks on the one hand, and intertemporal risks on the other. A characteristic trade-off emerges: institutions that are particularly good at managing risks at a given point of time are not so good at dealing with intertemporal risks, and vice versa. Allen/Gale show convincingly that intertemporal risks can only be smoothed intertemporally, and that there are basically two strategies available for achieving this. One is intergenerational risk sharing, which, as will be explained below, can be effected above all via the pension system; and the other is the accumulation of claims against banks and insurance companies. A key feature of asset accumulation as a mechanism of risk reduction – which is based on the same logic as that which underlies the strategy of stockpiling to cover the risk of a shortage of material goods – is that the holders of the claims do not incur any – or only a very minor – price risk, even though the market value of the assets by which their claims are ultimately secured may well be subject to risk. In practical terms, this means that the asset-accumulating households hold claims for a fixed amount against the aforementioned types of financial institutions. They therefore bear –

[28] See, above all, Allen/Gale (1995, 1997 and 2000) and also Bhattacharya/Padilla (1998), Bhattacharya/ Fulghieri/Rovelli (1999) and Fulghieri/Rovelli (1998).

from a subjective point of view, at least – no price risk, or only a very small one. If the financial institutions meet the claims, they are able to smooth, at the level of the society as a whole, the intertemporal risk.

For "asset accumulation" to work, two preconditions must be satisfied: First, competition between the financial institutions which meet claims for fixed amounts on the basis of deposits must not be too intense because heavy competition for customers' money might lead the institutions, in the event of "positive" shocks, to decide to stop smoothing the yields which they pay out in order to attract new customers. This behaviour would destroy the "asset accumulation" mechanism. Second, capital markets as alternative providers of investment options must not be so important, and for households (private investors) not so easily accessible and not so attractive, that savers would decide to shift their assets from financial intermediaries to the capital markets if market trends were favourable, as in the long run this would also render intertemporal risk-smoothing impossible. In other words, the smoothing of intertemporal risks is possible only if financial intermediaries such as banks and insurance companies are not exposed to too much competitive pressure, and pressure to "perform", from the capital markets. In practice this means that in purely quantitative terms they must play a dominant role in capital allocation in order to cushion the risks associated with the assets they hold.

Capital markets are not able to perform this intertemporal smoothing of risks which cannot be diversified at a specific point in time because they do not approximate the ideal of an Arrow-Debreu world in which there are complete markets for all present and future risks. Nonetheless, real capital markets can definitely make a contribution to an efficient allocation of time-specific, potentially diversifiable risks through the exchange mechanism, also termed cross-sectional risk sharing. In fact, they are veritable specialists in risk allocation at a given point of time. Conversely, financial intermediaries are well suited to smoothing intertemporal risks, especially if – as in the case of savings banks and co-operative banks – there are no market prices for the shares of these institutions' capital that are held by their owners: In times of relative surplus they take in assets in the form of funds and in times of relative shortage they disburse funds, thereby "concealing" changes in households' true wealth positions and enabling them to avoid major fluctuations in their expenditures for consumption.[29]

What role does the form of the statutory pension system play in this context? The pay-as-you-go system is a mechanism for intergenerational risk sharing in which the level of expected pensions is determined primarily by the development of incomes earned by people in work, and is scarcely influenced by (longer-term) fluctuations in the price of assets. With funded pension systems, in contrast, intergenerational, and thus also intertemporal, risk sharing is not feasible precisely in situations where (1) the accumulated savings are – as most reform proposals advocate – invested via pension funds on the capital market in equities and (2) the pension system is designed according to the "defined

[29] For a more detailed discussion of this point, see Allen/Gale (2000), in particular Chapter 6.

contribution" principle. In such cases it is the beneficiaries who bear the full asset price risk. Longer-term fluctuations in asset prices cannot be smoothed in this system because the return on the accumulated asset claims is directly dependent on equity price movements. That these risks are real, even today, is easy to appreciate if one considers the hypothetical case of a Japanese employee who provided for his old age by investing in a Japanese equity fund. Since 1989 he would have achieved a negative return of nearly 40%.

Like the capital markets and banks/savings institutions/insurance companies, the design of the pension system also has an influence on risk allocation within a national economy, and each of these two parts of the financial system strongly influences the other and helps to define how it functions. In countries like Germany, France and Italy, but also Japan, where banks play, or, as the case may be, played, a strong role and the capital market traditionally plays, or played, a weak role in the financing process within the economy, the pension system is predominately based on the pay-as-you-go principle. In capital market-dominated countries like the U.S. and the U.K., in contrast, funded systems are much more important. What might be the cause of this correlation?

Given that there are two mechanisms which are suitable for the intertemporal smoothing of risks, namely asset accumulation, which is best achieved by a banking system that is not integrated into the capital market to any appreciable extent – a system of savings banks would be the most extreme example of such an "insulated" system – and intergenerational risk sharing, as is effected by a pay-as-you-go system, one might imagine that in practice each of the two mechanisms can substitute for the other: where "savings bank-like" banks exist and play an important role, there is less of a need for a pay-as-you-go system – and vice versa.

Yet in the final analysis it would be incorrect to consider the existence of a demand-induced substitutionality as the only, or even as the dominant relationship between these two elements of a financial system. Imagine a financial system in which banks dominate the financing process, and enable the intertemporal smoothing of risks to take place through asset accumulation. The introduction of a funded pension system which rapidly accumulated substantial volumes of funds would lead to inconsistencies in this system, because the advantage of a funded system is precisely that the pension funds are given the opportunity to invest in tradable equities in order to achieve a higher return than is possible with the pay-as-you-go system. However, in order for this to be feasible, well developed, differentiated, liquid capital markets must exist which are accessible to a great many different types of market participants. But if such markets exist, banks and insurance companies lose the ability to smooth risks, precisely because the option of shifting funds to the capital markets becomes so attractive both for the financial institutions themselves and for depositors and the holders of insurance policies that the financial intermediaries, and ultimately the savers/deposits/ insurance policy-holders as well, are no longer able to "immunise" themselves against the risk of asset price changes.

If intertemporal risk smoothing is considered to be important in an economy, it makes sense to have this function performed by strong banks acting in conjunction with a relatively small and underdeveloped capital market on the one hand, and, on the other, with a pension system based on the pay-as-you-go principle. Thus these two elements of a financial system are indeed complementary elements of a financial system in the sense that each supports the other and helps it to function, and it can be assumed that, in the final analysis, this complementarity with regard to the supply side outweighs the demand-induced substitutionality.

Following the same logic, well developed capital markets and banks which are, relatively speaking, less important as financial intermediaries on the one hand, and, on the other, a funded pension system operating on the "defined contribution" principle, are complementary.

Thus, both institutional designs, i.e. that prevailing in Germany and that prevailing in great Britain, may be regarded as consistent or coherent. One criterion that may be used to determine which of these two consistent configurations is more advantageous from a societal standpoint is that of the significance of intertemporal risk sharing vs. intratemporal or cross-sectional risk sharing – and the way in which people perceive the two kinds of risks – in a given society. Admittedly, though, there are also other relevant aspects, and these are discussed at length in the current pertinent literature.

3.2. The Non-Tradability of Human Capital

In the final analysis, the problem described in the preceding section stems from the fact that in the real world no intertemporally complete (capital) markets exist in which all kinds of claims on future state-dependent income can be traded. As early as 1983, the Nobel laureate Robert C. Merton drew attention in this context to an additional aspect of the imperfect nature of markets which is of relevance when assessing pension systems: the non-tradability of human capital. Merton argues that private activities undertaken to create retirement income usually give rise to investments that generate a return which is a function of the profitability of real capital in the specific economy in question. Generally speaking, though, optimal protection against the risk of falling returns through diversification can only be achieved if all assets – i.e. not only real capital but also human capital – are tradable. Typically, though, human capital is not tradable. As a consequence, at the beginning of his life cycle an individual is poorly protected against changes in the future factor productivity of labour and capital, and thus against factor price risks. If there is no trade in claims on the returns on the deployment of individuals' human capital, this means that, during his working life, a *young* person holds an unbalanced portfolio because his weak net asset position has prevented him from accumulating real capital on any appreciable scale. His assets consist primarily of the earning power of his labour, i.e. his individual human capital. The situation is exactly the reverse for old people. A retired person or old-age pensioner mainly holds claims on the returns on the deployment of real

capital; his human capital has become almost worthless. If there were a private market for human capital, young workers would sell claims on the return on their own human capital – "shares" in that capital – to the older generation and use the proceeds to buy shares in real capital. This would enable them to achieve a better balance in their portfolios and to "diversify away" at least a part of the factor price risk. This would also be advantageous for the older generation, as it could participate in the income obtained by future generations from economic activity, and it would also end up holding a more balanced portfolio with an optimal risk structure. However, information- and incentive-related problems limits to the feasibility of participation,[30] and ethical barriers the nature of which does not need to be explained, are factors which preclude the establishment of such a market as they would prevent it from functioning properly.

In an analysis based on a theoretical model, Merton showed that, in conjunction with a consumption tax, a pay-as-you-go system can take the place of this missing human capital market. Although we cannot discuss Merton's line of reasoning in detail here, the underlying logic should be clear: in a pay-as-you-go system, various generations can participate in the future changes in factor prices via the *intergenerational* exchange that takes place in such a system. If certain conditions are met, the risks resulting from the non-existence of a market for human capital can be efficiently shared between the generations. This leads to an increase in welfare and improves the incentives to invest in human capital.[31]

What is the connection between this line of reasoning and financial systems? In the brief overview of the German financial system that was presented in section 2, we made it clear that the relatively strong incentives to undertake firm-specific investments in human capital which the German system provides, and its institutional mechanisms for the protection of such investments, constitute one of the key advantages of this type of financial system. This protection should be augmented by the pension system. The line of reasoning that takes Merton's findings as its point of departure shows that the pay-as-you-go principle provides such protection.[32]

[30] Transactions cannot be conducted with a generation that has not yet been born. For this reason, the capital market is intertemporally incomplete. This aspect is modelled as part of overlapping generations models in Boldrin/Montes (2000) and Rangel (1999).

[31] The conditions that must be given in order for Merton's analysis of 1983 to be valid have in the meantime been analysed in detail. See Breyer (1989), Richter (1990, 1993) and Enders/Lapan (1993). However, the basic relevance of the argument is not questioned. The recent analyses of the imperfect nature of the market for human capital by Sinn (1998), Werding (1999) and Boldrin/Montes (2000), which confirm the validity of Merton's findings, are of particular interest in this connection.

[32] We do not wish to create the impression here that there are no drawbacks to this type of system. Sinn (1998) in particular has drawn attention to the free-rider problem with respect to investments in human capital in a pure pay-as-you-go system. However, as is explained in the concluding

3.3. Summary and Conclusions

In this section, it was our intention to show that the pay-as-you-go principle does indeed have advantages, provided one takes certain market imperfections into account. Moreover, we argued that the design of statutory pension systems should be compatible with the predominant mode of risk allocation. In the following section, this macroeconomic approach will be rounded off by the presentation of relevant microeconomic aspects. It makes sense to add a microeconomic perspective because the type of financial system that has evolved in a given country influences the way in which incentives are created in the firms in its economy, the way in which its firms take decisions, and the way in which these incentives and decisions serve to resolve conflicts and take various interests into account.[33]

It has already been pointed out that company pension schemes in Germany and the U.K. differ greatly both in terms of their relative importance compared with the statutory pension system and with regard to their design. In France, by contrast, it is fair to say that company pension schemes do not really exist, as was shown in section 2.2.d. For this reason, the arguments presented in the following section do not apply to France.

4. Company Pension Schemes and the Financial System

4.1. Company Pension Schemes and the Creation of Incentives

Company pension schemes are an important instrument for influencing employees' behaviour. In this context, influence can be exerted above all in two areas: For one thing, the company-level pension system creates incentives which can influence employees' decisions as to when they will voluntarily retire. This can also mean that they will opt to retire before reaching the statutory retirement age.[34] For another, depending on the specific design of the national pension system, employees are given various incentives to accumulate firm-specific human capital and to develop a long-term commitment to their companies. This latter aspect is of particular importance if one wants to analyse how the design of company pension schemes fits into respective national financial systems. Pension funds clearly have advantages over pension reserves if criteria such as transparency or the generation of returns which are appropriate to the degree of risk incurred are applied. With pension funds, improved risk diversification can be achieved because employees' pension claims are more independent of the specific firms for which they work.

A system based on pension funds has disadvantages, though, if the goal is to strengthen employees' commitment to their companies. Krahnen (1990), among others, has drawn

remarks, the effects of these perverse incentives can be alleviated by suitable institutional adjustments within the system.

[33] For a detailed discussion of this point, see Schmidt/Grohs (2000) and Hackethal/Schmidt (2000a).

[34] Lazear in particular drew attention to this point as early as 1983. However, it seems to us that one cannot develop an explanation for this aspect which "fits into" the overall context of the financial system as it has been defined here, and therefore we will not discuss this aspect in this paper.

attention to this point: in the German system, for example, the number of years a person has been employed by a company is taken into account when determining the size of the company pension to which he is entitled, and typically employees must have worked at a given company for 10 years in order to be entitled to receive a company pension. This reduces the incentive to go to work for a different company and is conducive to the immobility – or stability – of employment relationships. This effect can also materialise in the British system, which relies primarily on pension funds operating according to the defined-benefit principle to provide company pensions. However, it is much easier in the U.K. for employees to take their pension entitlements with them if they change jobs (there is much greater "portability" of such entitlements) because the pension funds, which are legally autonomous entities, are more easily able to maintain pension benefit accounts for employees of various firms, and because employees are entitled to receive retirement benefits (they are "vested") after only two years.[35] Thus, in the British system, which is similar to the U.S. system in this respect, the ability of the company pension system to create incentives for workers to make a long-term commitment to a given company has been deliberately weakened by the creation of certain institutional arrangements.[36]

Mechanisms which encourage immobility, or loyalty to one's employer, which is a key feature of the German system of company pension provision, would appear to be meaningful particularly if great significance is attached to the accumulation of firm-specific human capital. From the point of view of employees, the German system creates incentives to accumulate such capital. Consequently, the use of pension reserves "fits into" the German financial system, which, in view of elements such as co-determination and the influence exercised by banks, is generally more geared to promoting the formation of firm-specific human capital than the Anglo-Saxon system. However, the incentives to undertake investments in firm-specific human capital must be supported and safeguarded by other features of the system as a whole (e.g. corporate financing patterns, the structure of the financial system, and, most importantly, corporate governance structures) in order to ensure that employers (managers) do not exploit these investments to further their own interests (the so-called holdup problem). These mechanisms will be described in the following two sections, in which the relationship between the design of company pension schemes, corporate financing and corporate governance is outlined.

4.2. Company Pension Schemes and Corporate Finance

Whether there are differences in the national structure of corporate finance in Germany, France and the U.K. is a hotly debated topic. The picture that emerges from balance-sheet data and from the type of flow-of-funds analyses that have been predominant in this field

[35] See Davis (1995).

[36] On the other hand, of course, there is much to be said for the introduction of such arrangements, and for the design of a system which offers "portability".

of research so far, does not provide a clear answer to this question.[37] Mayer (1988) and Corbett/Jenkinson (1997) in particular conclude on the basis of their own analyses that national patterns of the financing of corporate investment do not vary in any essential way and that internal financing dominates in all of the countries covered by their investigations. However, recent studies on intermediation and securitisation rates in the three countries indicate that, as regards external financing, bank finance is more important than finance provided by the capital market in the continental European countries, while the opposite is true in the U.K. and the U.S.[38] Moreover, this impression is confirmed by empirical studies carried out by Hackethal (2000) and Hackethal/Schmidt (2000b), which show that the analyses undertaken by Mayer and Corbett/Jenkinson are characterised by methodological weaknesses which caused these authors to overestimate the importance of internal financing. As these more recent studies show, internal financing, which consists primarily of depreciation, is only defined as a residual quantity in national flow-of-funds statistics and thus the extent of internal financing cannot be accurately assessed using the conventional methodology. If the amount of depreciation is deducted, Germany turns out to be the only country among those compared in the present paper in which the volume of internal financing still proves to be significant – a fact which, moreover, was highlighted by the OECD in a study of capital flows which it carried out using corporate balance sheet figures drawn from its own specialised data base.[39]

How do these findings fit into our picture of company pension systems in Germany and the U.K.? On the one hand, the pension reserve, as the typical form of company pension scheme in Germany, is a source of internal finance and, on the other, in purely formal terms it is a claim for a fixed amount held by those who are entitled to pension benefits, and is thus a form of debt. At first sight, internal financing creates an additional firm-specific risk from the point of view of the employees. However, if improved internal financing options are available, these can be used to smooth the firm's cash flow. This reduces the firm-specific risk, and in this sense it can have a positive impact on the willingness of the employees to undertake investments in firm-specific human capital. In particular, a lessening of the risk of bankruptcy has a favourable impact in terms of promoting investments by the employees in human capital. It can also make sense for the firm's management to smooth its earnings if, as a result of incentive- and information-related problems, the enterprise has only limited financing options.[40] If this is the case, problems of under- and overinvestment can be alleviated by a smoothing of earnings, which will, in particular, make it easier to obtain additional and external debt finance.

[37] See Deutsche Bundesbank (1994, 1999), Mayer (1988), Rajan/Zingales (1995) and Corbett/Jenkinson (1997).

[38] See Schmidt/Hackethal/Tyrell (1999).

[39] See OECD (1995), p. 91, and Deutsche Bundesbank (1999), which, in a large-scale study carried out in co-operation with the Banque de France, compared the structure of corporate finance in Germany and France on the basis of balance-sheet data and arrived at this same conclusion.

[40] See Froot et al. (1993).

Internal financing via pension reserves can thus promote external financing by means of borrowing – an effect which is important particularly with regard to corporate governance.

In the U.K., provision for retirement income is "outsourced" and not dependent on the fortunes of specific companies. Most of the funds are invested in the capital market. This creates only weak incentives for employees to invest in firm-specific human capital, but at the same time it offers them the advantage of a return which, in view of the great diversification of the investments undertaken by the pension funds, is dependent only on the so-called systematic risk. From the point of view of companies, the fact that funds are invested in this way makes it more necessary for them to obtain their financing via the capital market, and it also makes the capital market a more attractive source of finance – a point which is clearly reflected in the differences which we outlined above between the financing patterns of companies in the U.K. and the U.S. on the one hand, and those of continental European countries on the other.

4.3. Company Pension Schemes and Corporate Governance

Ultimately the incentive effects of company pension schemes are determined by the systems of corporate governance. As has already been pointed out, an outsider control system is characterised by the fact that, when taking decisions, the company is basically geared to serving the interests of shareholders who are not employees of the company and are not otherwise directly associated with it, and are not involved in its day-to-day decision-making processes. In an outsider system, the interests of other stakeholder groups are either safeguarded explicitly through contracts or are taken into account in the sense that obvious violations of those interests will lead to the "exit" of the stakeholders in question – i.e. the termination of employment and credit relationships – or to expensive lawsuits or other forms of legal action, all of which would have a negative impact on the market value of the company's shares. In any case, the interests of the various groups of stakeholders are kept in alignment, and conflicts between them are revealed and resolved, via market mechanisms. Of greatest importance here are the market for corporate control (takeover market), the market for corporate managers and the competition on the product markets. If these markets are to function properly, a number of conditions must be fulfilled: the bulk of companies' equity capital must be held by small shareholders; there must be a great many companies that are listed on the stock exchange; there must be very clear regulations regarding the disclosure of information by companies and regarding insider trading and the takeover of companies; there must be a liquid, well-organised capital market; and there must be a competitive labour market. These are merely the most important conditions that must be met; a number of others could also be enumerated. Taken together, these characteristics quite accurately describe the overall configuration of the British system.

In an insider control system, by contrast, a company's activities are not geared solely to serving the interests of shareholders; rather, there is a process by which the interests of the most important stakeholder groups – e.g. the shareholders, the banks, suppliers, the

employees and the state – are harmonised with the goal of achieving a consensus. This alignment and balancing of interests is effected via long-term and at least partially implicit contracts, which are safeguarded by active participation in the system by which corporate governance is exercised. The viability of an insider system depends on whether the various groups can be given far-reaching rights to participate in the affairs of the company and bring their influence to bear, and on whether sophisticated conflict-resolution mechanisms are in place. The insider system produces concentrated shareholder structures involving the holding of large stakes by other companies, creates scope for banks to actively influence firms, and gives rise to extensive co-determination rights on the part of employees. However, it also entails – as a correlate – a clear separation between management bodies and control (or supervisory) bodies in the corporate governance structure. The capital market is not particularly significant either as an instrument of control or as a source of finance. These features are all characteristic aspects of the German corporate governance system, thus indicating that in Germany corporate control is exercised via an insider system.

In both Germany and the U.K., the company pension systems serve to stabilise the respective national corporate governance systems. The British pension funds invest up to 80% of their resources in shares, they typically hold a broadly diversified portfolio, and through their behaviour as investors they help to create the basis for an active takeover market.[41] Overall, they pursue a policy of active portfolio management, but they hardly actively intervene in corporate decision-making. The individual pension funds compete vigorously with each other in their efforts to attract employees' retirement funds. This shapes their behaviour as investors and causes them to focus on short-term profitability, which is compatible with the orientation towards shareholders' interests that is characteristic of the outsider system.

In Germany, when employees acquire their entitlement to a company pension, they also acquire a long-term financial interest in the company. Their financial claims, or entitlements, are debt claims, and in this sense the employees' interests are congruent with those of the banks as the main providers of external debt, but given the long-term nature of the employees' claims and the fact that the company is not obliged to pay out any funds to them prior to their retirement, these claims are also similar in some ways to equity capital. It should be noted that the company's "house bank" is in an analogous position, and not least because its claims are in some ways similar to equity capital, the "house bank" often plays an active role in efforts to deal with serious crises facing the company, intervening to support measures that will keep the company afloat and promote necessary restructuring. In this sense, situations can arise in which the company's employees find that their interests are aligned with those of its house bank.[42] The long-term, implicit contracts with

[41] For a more detailed discussion of the points raised in the following, see also Davis (1999) and Clark (2000b).

[42] On this point, see also Krahnen (1990) as well as the studies by Elsas/Krahnen (1998, 2000), which are based on empirical investigations.

the employees boost their motivation and make them more willing to undertake firm-specific investments. The relevant contracts are safeguarded by the many different forms of co-determination that exist in Germany. These include the presence of a representative of the employees on the supervisory board, but also the co-determination at the level of individual operating units which is provided for in the Employees' Representation Act. This reduces the danger of a "holdup" by the employers.

In France, a configuration of this type, with its characteristic alignments of interests, cannot be identified. While employees there have a greater right to be consulted regarding corporate decisions than their counterparts in the U.K., co-determination is much less highly developed than in Germany. Employees do not have a long-term pension system-induced interest in the welfare of the companies they work for. The trade unions are organised along centralistic lines and do not take company-specific interests into account to any appreciable extent. Thus, the fact that company pension schemes do not exist underscores the ambivalent character of the French corporate governance system, and of the financial system as a whole.

5. Concluding Remarks

5.1. The Consistency Between Financial Systems and Pension Systems

It was the goal of this paper to show that two of the three national financial systems (those of Germany and the U.K., but not that of France) are largely consistent at present. In line with the broadly defined concept of the financial system which was provided at the outset, the respective national pension systems have been explicitly characterised as constituent elements of the three countries' financial systems. In structural terms, the various features of the pension systems in Germany and the U.K. "fit into" the overall environment created by each country's financial system. This insight supplements and rounds out the findings regarding these financial systems which we have presented – above all in collaboration with Andreas Hackethal – in a number of other studies; specifically, it broadens the scope of the analysis to include an aspect of financial systems which is not discussed in the other contributions.[43]

For Germany, the results of our assessment can be summed up as follows: The German financial system is dominated by banks and bank financing; by contrast, organised capital markets play only a secondary role. The German pension system, which comprises a statutory pension system based on the pay-as-you-go principle and company pension schemes which rely primarily on pension reserves, helps to maintain the present character and stability of the overall financial system. The system of company pension schemes contributes to the continued viability of the financial system as a whole in two ways: Firstly, it "protects" the banking system against competition from powerful and efficient capital markets, and thus helps to maintain its ability to perform intertemporal risk

[43] In addition to the studies that have already been mentioned, see also Hackethal/Tyrell (1999) for a theoretical analysis of the concept of complementarity in the context of financial systems.

smoothing as defined and analysed by Allen/Gale and Merton. And secondly, the fact that the company pension schemes rely on pension reserves, which are invested internally by firms, also makes the employees who are entitled to pension benefits an important group of "creditors" who have placed capital at the disposal of the companies for which they work. This creates a commitment on the part of the employees which makes them less likely to leave the companies they work for; it increases their incentives to accumulate firm-specific human capital; and it also creates a certain congruence between their own interests and those of the universal banks and the company's managers. The various parties have a common interest in ensuring the long-term viability of the company, and this common interest takes precedence over their specific individual interests. In view of the increasing importance of non-transferrable knowledge as a means of generating competitive advantages, a stakeholder orientation of this type is probably also in line with the interests of the owners (shareholders). Long-term employment and financing relationships are still a characteristic feature of the German economy, and while relationships of this type have the disadvantage of being inflexible and opaque, they may be even more important today than they were in the past. The German system of corporate governance, which forces shareholders, banks and employees to co-ordinate their interests, also provides a certain amount of protection against the accumulation and exercise of excessive decision-making power by the managers of companies, who are often not adequately monitored by the capital markets.

The logic behind our hypothesis that there is a good "fit" between the German company pension system and the overall financial system can also be illustrated by considering how things would change if Germany had a pension system of the British type: a system comprising strong banks which also play an active role in monitoring large corporations, as well as co-determination at a company-wide level and at the level of individual operating units, would not be consistent if the system for the payment of retirement income relied primarily on pension funds of the Anglo-Saxon type. If this were the case, the pressure from the capital market would be so strong that the banks would no longer be able to exert influence on companies and co-determination – at least at the company-wide level – would no longer work, and these features of the system would not survive.

The British system is also consistent. In the U.K. the provision of retirement income is effected via pension funds which invest their assets in the capital market – primarily in shares – and for which it is (necessarily) very important that the capital market plays a key role not only in corporate finance but also in corporate governance. There is a good "fit" between the British form of pension provision, the design of the British financial sector and the British mode of corporate control. The U.K. financial system is capital market-dominated, and intertemporal risk management à la Allen/Gale is not highly developed. As we did in the case of Germany, let us consider what would happen if the nature of the pension system were to change radically, i.e. let us suppose that, within the British financial system, the provision of retirement income were to be effected primarily via a system based on the pay-as-you-go principle which also comprised pension reserves used

for internal financing. This would only have the effect of weakening the capital market, without, however, creating a functional equivalent of the capital market in the form of an insider-control system, and thus the resulting overall system would not be consistent, and it would probably also not function.

By contrast, the French financial system currently appears to be inconsistent. This is also reflected in the French system for the provision of retirement income, which consists of both a statutory pension system and company pension schemes and is based almost exclusively on the pay-as-you-go principle. Given the way the company pension system is designed, it does not encourage employees to undertake firm-specific investments in human capital, and it also does not support the disciplining function of the capital market. In a financial system which is becoming increasingly similar to the systems of the U.K. and the U.S. in terms of its financing patterns, this leads to frictional losses and conflicts. In France as well, risk management à la Allen/Gale is not highly developed due to the fact that the position of the banking sector has been weakened. The individual elements do not fit together and they do not create a consistent overall configuration.

5.2. System Dynamics and the Scope for Change

It would certainly be naive to conclude, based on the great significance of the compatibility of a country's pension system with the other parts of its financial system, that all coherent systems are necessarily also good systems. In our view, the most that one can say is that an incoherent system cannot be a good system. And even after the passage of pension reform legislation in 2001 which provides, among other things, for the introduction on a limited scale of options for funded pension provision the conformity of the German pension system with the overall financial system has not been undermined.[44] By the same token, though, it cannot be assumed that this reform has solved the very serious problems confronting the German pension system, which are an outgrowth of demographic trends and certain special factors, such as German unification. The introduction of pension funds or other, comparable institutions, on a *broad* scale – which would create a new overall system *based primarily* on funded systems for the provision of retirement income – is seen by many observers as offering the only possible solution to the problems of the German pension system. Accordingly, the Anglo-Saxon type of financial system is often presented, either explicitly or implicitly, as a model which Germany should strive to imitate.[45] Thus, one could ask whether the creation and large-scale introduction of pension funds in Germany might be both a part of, and an indication of, a *gradual* shift from the current

[44] Jürgen Pfister, the chief economist at Commerzbank, takes a similar view. In his paper prepared for the Bundesbank conference on "Ageing, Financial Markets and Monetary Policy" (Pfister (2001)), he notes with regret that the new German pension funds – one of the elements of the private, corporate pension system which the state makes a special point of promoting via favourable tax treatment – "can hardly count as pension funds along Anglo-American lines" (p. 2).

[45] With regard to pension systems, see Feldstein (1998), and for a more general discussion of this point, see La Porta et al. (1998).

configuration of the German financial system to a new architecture based on the Anglo-Saxon model.

The consistency of financial systems also has implications in terms of the ways in which processes of change can – or, more importantly, cannot – take place. This is why we feel it is unlikely that there will be a gradual, smooth transition from the current German financial system to one which is configured like the systems in the U.S. and the U.K. Our reasons for taking this position are as follows: The economy of a country exerts pressure on its entire financial system which invariably has the effect of promoting modifications in the design of the system which will make it operate efficiently. And if the system is to be efficient, it must, at the very least, be configured in such a way that its individual elements fit together. However, when reforms are implemented, they usually do not target the system as a whole, but rather only individual elements thereof. Let us now consider, as a completely hypothetical example, the German financial system G and the British financial system B, each of which contains the elements a, b, c und d. The elements of the German system take on the values a_1, b_1, c_1 and d_1, and the elements of the British system take on the values a_2, b_2, c_2 and d_2. The element c represents the pension system, with c_1 denoting a pay-as-you-go system and c_2 a funded system. We consider both systems to be consistent because, as combinations of values, the sets a_1, b_1, c_1 and d_1 and a_2, b_2, c_2 and d_2 are "better" in terms of the overall functionality of the respective systems than sets in which at least one element carries the other subscript. This also applies to the element "pension system":

$$(a_1, b_1, c_1, d_1) > (a_1, b_1, c_2, d_1) \text{ and } (a_2, b_2, c_2, d_2) > (a_2, b_2, c_1, d_2).$$

It can also be valid in a situation where the values for the one element c can be compared and evaluated in isolation, and where, for example, the comparison shows that $c_2 > c_1$, and even in a situation where the two overall configurations or systems (a_1, b_1, c_1, d_1) and (a_2, b_2, c_2, d_2) can be compared and evaluated.

One could attempt to "reform" the system by introducing the pension system c_2, which, when viewed in isolation, appears to be "better", i.e. one could replace (a_1, b_1, c_1, d_1) with (a_1, b_1, c_2, d_1). However, this replacement would not be viable, because, in line with our underlying assumptions, the consistency of the overall system is crucial, and (a_1, b_1, c_1, d_1) > (a_1, b_1, c_2, d_1) applies. Accordingly, the system would return to its original state and the reform would fail.[46]

If "reforms" undertaken within financial systems do not work, "bad" systems can prove to be very durable. On the other hand, we cannot expect bad systems to last indefinitely; at some point, a fundamental change is inevitable. But how might a "revolutionary" change in the nature of a financial system take place? Would such a change automatically involve the better system being adopted after a competition between systems had highlighted the advantages and disadvantages of each? Not necessarily. Indeed, it is more likely that in

[46] F*rankfurter Rundschau*, 3 July 2001.

such a competition, the specific system that makes the greatest use of explicit incentives and mechanisms, and thus relies to the smallest extent on implicit co-ordination mechanisms to organise relations between economic agents, would emerge as the "winner". There can be no doubt that this description more closely fits the British system than the German one.[47]

Nonetheless, there are options which would allow the "pay-as-you-go" principle to be retained as the dominant organising principle of the national pension system, and at the same time permit the urgent financing problems faced by the statutory pension system to be solved in such a way that the configuration of the financial system would not be undermined to any appreciable extent and the burdens would be allocated equitably between and within the generations. Hans-Werner Sinn in particular has recommended a solution along these lines, which he has discussed in various publications.[48] He recommends augmenting the prevailing pay-as-you-go system on a limited scale through the introduction of elements of a funded system. In making his case for the solution he has put forward, Sinn begins by explaining that, in his view, the crisis of the pay-as-you-go system in Germany is in essence an outgrowth of demographic developments. In the final analysis, this means that, overall, the working-age population is investing too little in future human capital, i.e. the current generation of working-age people is not having enough children to enable the system to pay the pension benefits to which it will be entitled when it reaches retirement age. From this, Sinn draws the conclusion that those members of the economically active population who do not have any children, i.e. those who have not invested in human capital, should be entitled to smaller pension benefits in the framework of the pay-as-you-go system. Moreover, he recommends that, in addition to making their contributions to the statutory pension system, they should be induced to invest a portion of their income in real capital. In Sinn's view, the resulting *double* burden is justified because this part of the population also has lower expenses due to the fact that they do not have children.

The introduction of a system of this type would, firstly, make the pension system as a whole more equitable and improve the financial situation of the existing statutory pension system; secondly, it would, over the long term, create improved incentives to invest in human capital, and thus safeguard the viability of the pay-as-you-go principle. This augmentation of the existing system for the provision of retirement income would require the incorporation of elements of a funded system on only a limited scale, and it would preserve the basic structure of the system, and thus also preserve its consistency with the

[47] For a detailed discussion of this point, see Schmidt/Spindler (2001).

[48] See Sinn (1998, 1999), and Boldrin et al. (1999) and Breyer (2000, 2001), who argue along similar lines.

other elements of the financial system, which is a desirable outcome from the standpoint of national economic policy.[49]

[49] In this connection, it is also interesting to examine the findings of an empirical study dealing with the current degree of acceptance of the welfare state – and its future – in continental Europe which was carried out by Boeri/Börsch-Supan/Tabellini (2001) and was based on surveys conducted in Germany, France, Italy and Spain. The following sentence sums up the authors' conclusions: "Whether we like it or not, public opinion in continental Europe seems to be strongly averse to the social model advocated by Mrs. Thatcher in the U.K. or by President Reagan in the U.S." (p. 44) .

References

Allen, F., Gale, D. (1995): *A Welfare Comparison of Intermediaries and Financial Markets,* European Economic Review, 39, pp. 179-209

Allen, F., Gale, D. (1997): *Financial Markets, Intermediaries and Intertemporal Smoothing*, Journal of Political Economy, 105, pp. 523-546

Allen, F., Gale D. (2000): *Comparing Financial Systems*, Cambridge, Mass.

Arbeitskreis "Finanzierung" der Schmalenbach-Gesellschaft für Betriebswirtschaft e.V. (1998): Betriebliche Altersversorgung mit Pensionsrückstellungen oder Pensionsfonds – Analyse unter finanzwirtschaftlichen Gesichtspunkten, Der Betrieb, Vol. 51, pp. 321-333

Atkinson, A. (1999): *Reform of the Welfare State and Economic Performance*, in: Hauser, R. (ed.), *Die Zukunft des Sozialstaates*, Berlin, Schriften des Vereins für Socialpolitik, Vol. 271, Berlin, pp. 53-72

Barro, R.J. (1974): *Are Government Bonds Net Wealth?*, Journal of Political Economy, 87, pp. 940-971

Bertero E. (1994): *The Banking System, Financial Markets, and Capital Structure*: New Evidence from France, Oxford Review of Economic Policy, 10, pp. 42-54

Bhattacharya, S., Fulghieri, P., Rovelli, R. (1998): *Financial Intermediation Versus Stock Markets in a Dynamic Intertemporal Model*, Journal of Institutional and Theoretical Economics, 154, pp. 291-319

Bhattacharya, S., Padilla, A. J. (1996): *Dynamic Banking: A Reconsideration*, Review of Financial Studies, 9, pp. 1003-10032

Blanchet, D., Legros, F. (2000): *France : The Difficult Path to a Consensual Reform,* mimeo, INSEE

Blanchet, D., Pelé, L.P. (1999): *Social Security and Retirement in France*, in: Gruber, J., Wise, D. (eds.), Social Security and Retirement around the World, Chicago

Blundell, R., Johnson, P. (1997): *Pensions and Retirement in the UK*, Cambridge (MA), NBER Working Paper No. 6154

Boeri, T., Börsch-Supan, A., Tabellini, G. (2001): *Would You Like to Shrink the Welfare State? A Survey of European Citizens*, Economic Policy, 33, pp. 9-50

Boldrin, M., Dolado, J., Jimeno, J., Peracchi, F. (1999): *The Future of Pensions in Europe*, Economic Policy, 29, pp. 289-313

Boldrin, M., Montes, A.M., (2000): *The Intergenerational Welfare State – Public Education and Pensions*, University of Minnesota, Working Paper

Börsch-Supan, A. (1998): *Zur deutschen Diskussion eines Übergangs vom Umlage- zum Kapitaldeckungsverfahren*, Finanzarchiv, 55, pp. 400-428

Börsch-Supan, A. (2000): *Was lehrt uns die Empirie in Sachen Rentenreform?*, Perspektiven der Wirtschaftspolitik, 1, pp. 431-452

Breyer, F. (1989): *On the Intergenerational Pareto Efficiency of Pay-as-you-go Financed Pension Schemes*, Journal of Institutional and Theoretical Economics, 145, pp. 643-658

Breyer, F. (2000): *Kapitaldeckungs- versus Umlageverfahren*, Perspektiven der Wirtschaftspolitik, 1, pp. 383-406

Breyer, F. (2001): *Why Funding is not a Solution to the "Social Security Crisis"*, Working Paper, University of Konstanz

Clark, G. (2000a): *Pension Systems: A Comparative Perspective*, Centre for Pension and Social Insurance Working Paper, London

Clark, G. (2000b): *Pension Fund Capitalism*, Oxford

Corbett, J., Jenkinson, T. (1997): *How is Investment Financed? A Study of Germany, Japan, the United Kingdom and the United States*, The Manchester School Supplement, Vol. 2000, 69-93

Davis, E.P. (1995): *Pension Funds, Retirement-Income Security and Capital Markets*, Oxford

Davis, E.P. (1999): *Pension Fund Reform and European Financial Markets*, London School of Economics, Special Paper No. 103

Deutsche Bundesbank (1994): *Eigenmittelausstattung der Unternehmen ausgewählter EG-Länder im Vergleich*, Monatsbericht Oktober, pp. 73-88

Deutsche Bundesbank (1999): *Zur Unternehmensfinanzierung in Deutschland und Frankreich: Eine vergleichende Analyse*, Monatsbericht Oktober, pp. 29-46

Diamond, P. (2000): *Towards an Optimal Social Security Design*, Working Paper, MIT

Elsas, R., Krahnen, J.P. (1998): *Is Relationship Lending Special? Evidence from Credit-File Data in Germany*, Journal of Banking and Finance, 22, pp. 1283-1316

Elsas, R., Krahnen, J.P. (2000): *Collateral, Default Risk, and Relationship Lending: An empirical study on financial contracting*, Working Paper, Centre for Financial Studies, Frankfurt

Enders, W., Lapan, H.E. (1993): *A Model of First and Second-Best Security Programs*, in: Felderer, B. (ed.), Public Pension Economics, Journal of Economics, Supplement 7, pp. 65-90

Faugère, J.-P., Voisin, C. *(1994) Le système finançier francais*, Paris 1994

Feldstein, M. (1998): *Introduction*, in: Feldstein, M. (ed.), *Privatizing Social Security*, Chicago, pp. 1-30

Feldstein, M. (1998): *Transition to a Fully Funded Pension System: Five Economic Issues*, in: Siebert, H. (ed.), *Redesigning Social Security*, Tübingen, pp. 299-315

Franks, J., Mayer, C. (1994): *Corporate Control: A Comparison of Insider and Outsider Systems*, London Business School, Working Paper

Friderichs, H., Paranque, B., Sauvé, A. (1999): *Structures of Corporate Finance in Germany and France: A Comparative Analysis for West German and French Incorporated Enterprises with Special Reference to Institutional Factors*, in: Sauvé, A., Scheuer, M. (eds.), *Corporate Finance in Germany and France*, Deutsche Bundesbank, pp. 73-137

Froot, K., Scharfstein, D., Stein, J. (1993): *Risk Management: Coordinating Corporate Investment and Financing Policies*, Journal of Finance, 48, pp. 1629-1658

Fulghieri, P., Rovelli, R. (1998): *Capital Markets, Financial Intermediaries, and Liquidity Supply, INSEAD*, Working Paper

Hackethal, A. (2000): *Banken, Unternehmensfinanzierung und Finanzsysteme*, Frankfurt am Main

Hackethal, A., Schmidt, R. H. (2000a): *Finanzsystem und Komplementarität*, in: Supplements to Kredit und Kapital, No. 15: Finanzmärkte im Umbruch, pp. 53-102

Hackethal, A., Schmidt, R. H. (2000b): *Financing Patterns: Measurement Concepts and Empirical Results*, University of Frankfurt, Working Paper Series: Finance and Accounting, No. 33

Hackethal, A., Tyrell, M. (1999): *Complementarity and Financial Systems*, University of Frankfurt, Working Paper Series: Finance and Accounting, No. 10

Homburg, S. (2000): *Ein Schnellkurs in Sachen Rentenreform*, Perspektiven der Wirtschaftspolitik, 1, pp. 379-382

Jensen, M. (1986): *Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers*, American Economic Review, 76, pp. 323-329

Krahnen, J.P. (1990): *Über den Wert impliziter Treueprämien: Betriebliche Altersversorgung aus finanzierungstheoretischer Sicht*, Zeitschrift für betriebswirtschaftliche Forschung, 42, pp. 199-215

La Porta, R., Lopez-de-Silanez, F., Shleifer, A., Vishny, R. (1998): *Law and Finance*, in: Journal of Political Economy, 106, pp. 1113-1156

Lazear, E.P. (1983): *Pensions as Severance Pay*, in: Bodie, Z., Shoven, J. (eds.), *Financial Aspects of the United States Pension System*, Chicago, pp. 57-91

Mann, A. (2002): *Corporate Governance-Systeme: Funktion und Entwicklung am Beispiel von Deutschland und Großbritannien*, Berlin (also dissertation, University of Frankfurt, 2000)

Mayer, C. (1990): *New Issues in Corporate Finance*, European Economic Review, 32, pp. 1167-1188

Merton, R.C. (1983): *On the Role of Social Security as a Means for Efficient Risk Sharing in an Economy Where Human Capital Is Not Tradable*, in: Bodie, Z., Shoven, J. (eds.), *Financial Aspects of the United States Pension System*, Chicago, pp. 325-358

Nürk, B., Schrader, A. (1995*): Von der Pensionsrückstellung zum Pensionsfonds: Eine Chance für den deutschen Finanzmarkt*, Frankfurt am Main

OECD (1995*): National Systems for Financing Innovation*, Paris

Orszag, P., Stiglitz, J. (1999): *Ten Myths about Social Security*, mimeo, The World Bank

Pastré, O. (1992*): Les Nouveaux Piliers de la Finance*, Paris

Pastré, O. (1998*): Corporate Governance: the end of " l'exception francaise"*, Columbia Business Law Review, 1, pp. 79-95.

Pfister, J. (2001) : *Prospects for German Pension Reform*, mimeo, Commerzbank

Plihon, D. (1998): *Les banques: Nouveaux enjeux*, nouvelles stratégies, Paris 1998

Rajan, R.G., Zingales, L. (1995): *What Do We Know about Capital Structure? Some Evidence from International Data*, Journal of Finance, 50, pp. 1421-1460

Rangel, A. (1999): *Forward and Backward Intergenerational Goods: A Theory of Intergenerational Exchange*, Stanford University, Working Paper

Richter, W. (1990): *Social Security as a Means of Overcoming the Nonmarketability of Human Capital* , Finanzarchiv, 48, pp. 451-468

Richter, W. (1993): *Intergenerational Risk Sharing and Social Security in an Economy with Land*, in: Felderer, B. (ed.), *Public Pension Economics*, Journal of Economics, Supplement 7, pp. 91-103

Rürup, B. (2001): *The German Pension System – Status quo and Reform Options*, Working Paper, Technical University of Darmstadt

Schmähl, W. (2000): *Perspektiven der Alterssicherungspolitik in Deutschland – Über Konzeptionen, Vorschläge und einen angestrebten Paradigmenwechsel*, Perspektiven der Wirtschaftspolitik, 1, pp. 407-430

Schmidt, R.H., Grohs, S. (2000): *Angleichung der Unternehmensverfassung in Europa – ein Forschungsprogramm*, in: Grundmann, St. (ed.), *Systembildung und Systemlücken in Kerngebieten des Europäischen Privatrechts*, Tübingen, pp. 145-188

Schmidt, R.H., Hackethal, A., Tyrell, M. (1999): *Disintermediation and the Role of Banks*, Journal of Financial Intermediation, 8, pp. 36-67

Schmidt, R.H., Hackethal, A., Tyrell, M. (2002): *The Convergence of Financial Systems in Europe,* forthcoming in a special issue of the Schmalenbach Business Review

Schmidt, R.H., Spindler, G. (2001): *"Path Dependence, Complementary and Corporate Governance"*, to be published in: *Convergence and Persistence of Corporate Governance Systems,* edited by Jeffery Gordon und Mark Roe, Chicago: University of Chicago Press,

Schmidt, R.H., Tyrell, M. (1997): *Financial Systems, Corporate Finance and Corporate Governance*, European Financial Management, 3, pp. 159-187

Siebert, H. (1998): *Pay-as-you-go versus Capital-Funded Pensions: The Issues*, in: Siebert, H: Redesigning Social Security, Tübingen, pp. 3-33

Sinn, H.-W. (1998): *The Pay-as-you-go Pension System as a Fertility Insurance and Enforcement Device*, Cambridge (MA), NBER Working Paper, No. 6610

Sinn, H.-W. (1999): *Sozialstaat im Wandel*, in: Hauser, R. (ed.), *Die Zukunft des Sozialstaates*, Schriften des Vereins für Socialpolitik, Vol. 271, Berlin, pp. 15-34

Sinn, H.-W. (2000): *Why a Funded Pension System is Useful and Why It is not Useful*, Cambridge (MA), NBER Working Paper, No. 7492

Thum, M., von Weizsäcker, J. (2000): *Implizite Einkommenssteuer als Messlatte für die aktuellen Rentenreformvorschläge*, Perspektiven der Wirtschaftspolitik, 1, pp. 453-468

Tonks, I. (1999): *Pension Policy in the UK,* Centre for Pension and Social Insurance Working Paper, London

Tyrell, M. (2001): *Kapitalmärkte und Banken – Unterschiedliche Formen der Informationsverarbeitung als konstitutives Merkmal*, Wiesbaden

Walter, I. (1993): *The Battle of the Systems: Control of Enterprises and the Global Economy*, Kieler Vorträge, Neue Folge 122, Institut für Weltwirtschaft

Werding, M. (1999): *Umlagefinanzierung als Humankapitaldeckung: Grundrisse eines erneuerten "Generationenvertrages"*, Jahrbücher für Nationalökonomie und Statistik, 218, pp. 491-511

Williamson, J.B. (2000): *Social Security Privatization: Lessons from the United Kingdom*, Center for Retirement Research Working Paper 2000-10, Boston College