



The Pensions Institute

*Birkbeck College, University of London
7-15 Gresse St., London W1P 2LL, U.K.*

DISCUSSION PAPER PI-0010

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and the New Financial Landscape**

E. Philip Davis

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PENSION FUNDS, FINANCIAL INTERMEDIATION AND THE NEW FINANCIAL LANDSCAPE

E Philip Davis

Abstract

Pension funds are analysed as financial intermediaries using a functional approach to finance which encompasses traditional theories of intermediation. Funds fulfil a number of the functions of the financial system more efficiently than banks or direct holdings. Their growth complements that of capital markets and they have acted as major catalysts of change in the financial landscape. Financial efficiency in this functional sense is not the only reason for growth. It is also a consequence of fiscal incentives and benefits to employers, as well as growing demand arising from the ageing of the population.

JEL Keywords: G000 (Financial Economics/Financial Intermediation), G230 (Pension Funds), G300 (Corporate Finance and Governance)

The author is (till 8/00) Senior International Advisor in Financial Intermediaries Division at the Bank of England, and (from 10/00) Professor of Economics and Finance, Brunel University, Uxbridge, Middlesex UB3 4PH. He is also an Associate Member of the Financial Markets Group at LSE, Associate Fellow of the Royal Institute of International Affairs and Research Fellow of the Pensions Institute at Birkbeck College, London. Send correspondence to e-mail address: e_philip_davis@msn.com. The author thanks Philip Booth, Dick Brealey and Geoffrey Wood for helpful comments. The text draws on *Davis* (1995a). Views expressed are those of the author and not necessarily those of the institutions to which he is affiliated.

Introduction

The rapid growth of pension funds in many countries, and the stimulus they are providing to the growth of capital markets, both suggest that their activities as financial intermediaries merit considerable attention. Hence, after briefly summarising the key features of pension funds (Section I) we seek to evaluate them as financial intermediaries from a financial economics perspective, and thereby to assess their contribution to the evolving financial landscape. However, as noted in Section II, the “theory of financial intermediation” has to date been developed mainly with banks in mind. It accordingly tends to focus on the taking of deposits and issue of loans as the activities of financial intermediaries, and on a subset of the activities undertaken by intermediaries and markets. An understanding of the evolving role of pension funds as financial intermediaries and their effects on financial markets requires a broader canvas.

Accordingly, we seek to elucidate the role of pension funds mainly in the context of the *Merton and Bodie* (1995) “functions of the financial system” framework, which is introduced in Section III. The functional approach, which encompasses the traditional approach to intermediation, provides a natural framework for assessing “contributions to change” in terms of pension funds’ superior efficiency in fulfilling financial functions relative to other intermediaries and to direct holdings of securities. Drawing on the extensive existing literature on pension economics (see *Bodie and Davis* 2000), it is shown in Section IV that pension funds’ efficiency in this sense is an important factor underlying their rise to prominence¹. In this context, they tend to complement, and hence stimulate development of capital markets, while acting as substitutes for banks. On the other hand, as noted in Section V, growth of pension funds is also the consequence of a number of non-financial and demand-side features. In this context, a sharp distinction must frequently be made between relevant features of defined benefit and defined contribution funds. Before concluding, in Section VI we offer an assessment of the wider implications for the functioning of the financial system of a shift from bank-domination to a situation where pension funds and capital markets play a major role.

I What are pension funds?

Pension funds may be defined as forms of institutional investor, which collect, pool and invest funds contributed by sponsors and beneficiaries to provide for the future pension entitlements of beneficiaries (*Davis* 1995a). They thus provide means for individuals to accumulate saving over their working life so as to finance their consumption needs in retirement, either by means of a lump sum or by provision of an annuity, while also supplying funds to end-users such as corporations, other households (via securitised loans) or governments for investment or consumption. Pension funds have grown strongly in recent years in many OECD countries as well as in emerging markets, both relative to GDP and compared to banks.

Since early withdrawal of funds is usually restricted or forbidden, pension funds have long term liabilities, allowing holding of high risk and high return instruments. Accordingly, monies are intermediated by pension funds into a variety of financial assets, which include corporate equities, government bonds, real estate, corporate debt (in the form of loans or bonds), securitised loans, foreign holdings of the instruments mentioned above and money market instruments and deposits as forms of liquidity.

Pension funds are typically sponsored by employers, such as companies, public corporations, industry or trade groups; accordingly, employers as well as employees typically contribute. Funds may be internally or externally managed². Returns to members of pension plans backed by such funds may be purely dependent on the market (defined contribution funds) or may be overlaid by a guarantee of the rate of return by the sponsor (defined benefit funds). The latter have insurance features in respect of replacement ratios (pensions as a proportion of income at retirement) subject to the risk of bankruptcy of the sponsor, as well as potential for risk transfers between older and younger beneficiaries, which are absent in defined contribution funds (*Bodie (1990a)* and Section IV.4). For both types of fund, the liability is in real (inflation adjusted) terms. This is because the objective of asset management is to attain a high replacement ratio at retirement (pension as a proportion of final salary) which is itself determined by the growth rate of average earnings³. Defined contribution plans have tended to grow faster than defined benefit in recent years, as employers have sought to minimise the risk of their obligations, while employees seek funds that are readily transferable between employers.

Further key characteristics of pension funds are common to other institutional investors. These include:

- risk pooling for small investors, providing a better trade-off of risk and return than for direct holdings;
- a premium on diversification, both by holding a spread of domestic securities (which may be both debt and equity) and also by international investment;
- a preference for liquidity, and hence for large and liquid capital markets, which trade standard or 'commoditised' instruments;
- ability to absorb and process information, superior to that of individual investors in the capital market. On the other hand, unlike bank lending, pension funds rely on public information rather than private, which links strongly to their desire for liquidity;
- large size and thus economies of scale, which result in lower average costs for investors. These may arise from, inter alia, ability to transact in large volumes which typically leads to a lowering of transactions costs. Investors share the costly services of expert investment managers and thereby save

in advisory fees. Size also enables the funds to invest in large indivisible investments (although there is a tension with desire for diversification);

- countervailing power, which may be used to reduce transactions costs and custodial fees. This countervailing power also gives rise to ability to ensure the most favourable terms from capital market intermediaries on the one hand, and on the other gives a potential for improved control over companies in which they invest, thus reducing the incidence of adverse incentive problems.

We return to many of the above characteristics, drawing on the literature of pension economics, in assessing the role of pension funds as financial intermediaries in Section IV. First, we consider the extant “theory of intermediation”.

II The traditional theory of intermediation

The existence of financial intermediaries needs to be justified in economic terms because in the *Arrow-Debreu* world, the financing of firms (and governments) by households occurs via financial markets in a frictionless manner - there are no transactions costs - which leaves no role for financial intermediaries⁴. There are no transactions costs and there exists a full set of contingent markets in which all can participate. Credit markets also being perfect, individuals do not face credit rationing. Allocation of resources is Pareto optimal and there is no role for intermediaries to add value. In addition, (employing *Modigliani-Miller*), financial structure is irrelevant as in a world such as that described; households can construct portfolios which offset the actions of an intermediary and intermediation cannot add any value (*Fama* 1980).

As noted by *Allen and Santomero* (1998) the traditional theory of financial intermediation⁵ is focused on the real-world market features of transactions costs and asymmetric information. These are central to the activity of banks and insurance companies. The idea of transactions costs, first developed in the context of the theory of the firm by *Coase* (1937), was introduced as a key form of friction in financial markets by *Gurley and Shaw* (1960). Economies of scale which benefit intermediaries result from indivisibilities and nonconvexities in transactions technology which restrict diversification and risk sharing under direct financing. Examples include fixed costs of evaluating assets, and declining average trading costs which mean intermediaries may diversify more cheaply than individuals. The “liquidity insurance” banks provide to depositors and borrowers (whereby deposits can be cashed on demand while banks' assets are mainly long-term and illiquid) also results from scale economies in risk pooling (*Diamond and Dybvig* 1983).

The existence of asymmetries of information⁶ between borrowers and lenders gives rise to difficulties in screening the quality of entrepreneurs and firms to avoid adverse selection (*Leland and Pyle* 1977)

and monitoring their performance to minimise moral hazard (*Diamond 1984*). *Leland and Pyle* suggested that intermediaries can communicate proprietary information at lower cost than borrowers, and then sell claims to diversified portfolios of these assets to investors. *Diamond* suggests that financial intermediaries act as delegated monitors to overcome asymmetric information, whereby diversification reduces monitoring costs. A corollary is that market finance is only available to borrowers with a reputation (*Diamond 1989*).

Developing from these, theories of control also highlight the incompleteness of loan contracts and suggest that intermediaries are better able to influence the behaviour of borrowers while a loan is outstanding and seize assets or restructure in the case of default than markets (*Bolton 1990*). Alternatively, following the “relationship banking” tradition, commitment theories of intermediation (*Hellwig 1990*) suggest that financial institutions can form long-term relationships with borrowers, which reduce information asymmetry and hence moral hazard. Apart from economies of scale (which as noted by *Goodhart (1989)* apply equally to institutional investors) these considerations have arisen in the literature mainly for debt finance and for banks. Whereas the importance of information asymmetries and incomplete contracts is equally recognised for equity finance, the role of financial institutions as counterparts is less well developed. Equally, institutional investors such as pension funds may not rely on the same information and control mechanisms as banks.

III Functions of the financial system - a broad approach

More generally, pension funds’ increasing role in the financial sector (as described in Section I) goes much broader than the topics raised by the traditional theory of intermediation. There it was highlighted that their activities include inter alia collecting saving, investing in securities and other financial assets, disbursing annuities, providing forms of insurance, acting as operators in securities markets, cross border investors and owners of companies.

In the context of the above discussion of the theory of intermediation, *Allen and Santomero (1998)* point to financial developments related to deregulation, improved information provision via technological advances and financial innovations which have reduced transactions costs and improved investor information. These imply that the traditional arguments are no longer sufficient to justify intermediaries’ existence and continued growth. Accordingly, a sound theory of intermediation should in their view also take into account the activity of risk transfer and risk control between and by intermediaries on the one hand, and facilitation of participation in markets by individuals on the other. *Scholtens and Wensveen (1999)* suggest in addition that dynamic aspects of financial innovation and adaptation of institutions to gain competitive advantage should play a central role.

We contend that a suitable framework for assessing the role of pension funds as intermediaries and the boost they give to capital markets is via consideration of the overall functions of the financial system. This in effect encompasses the above reasons for existence of intermediaries such as pension funds and allows a richer menu of activities to be covered by the subject of intermediation. It also provides a basis for judging the extent to which pension funds are acting as agents of financial change by fulfilling the functions of financial systems more efficiently than the alternatives (such as banks and individual investors).

A functional approach to the financial system seeks to isolate constant features both of long term developments and of more recent trends. In effect, whereas the institutional form taken by financial systems is subject to evolution through time, the functions fulfilled by the financial system are relatively fixed. The evolution of institutional forms and of financial structure such as the growth of pension funds may thus be seen as a form of adaptation and improvement in the ways these functions are fulfilled, under pressure from competitive forces. Financial evolution is seen as a form of “innovation spiral” as innovations drive the system towards greater efficiency. Various paradigms have been proposed. Here we highlight and utilise that proposed by *Merton and Bodie* (1995). They focus on six functions, as follows:

- (i) the provision of means for clearing and settling payments to facilitate exchange of goods, services and assets.
- (ii) the provision of a mechanism for pooling of funds from individual households so as to facilitate large-scale indivisible undertakings, and the subdivision of shares in enterprises to facilitate diversification.
- (iii) provision of means to transfer economic resources over time, across geographic regions, countries or among industries.
- (iv) provision of means to manage uncertainty and control risk.
- (v) providing price information, thus helping to co-ordinate decentralised decision making in various sectors of the economy.
- (vi) providing means to deal with incentive problems when one party to a financial transaction has information the other does not, or when one is an agent of the other, and when control and enforcement of contracts is costly.

In this context, growth of certain types of financial intermediary (or market) such as pension funds is partly explicable in terms of a changing comparative advantage in terms of the functions they fulfil (related to the characteristics described in Section I). These advantages of pension funds tend to be complementary to capital markets but substitutable for the services of banks.

IV Pension funds as intermediaries and the functions of the financial system

We now assess pension funds relative to the various financial functions one by one, in order correctly to identify the role funds play in stimulating change in the financial landscape. In this context, we draw on the existing literature on pension economics (see *Bodie and Davis* 2000). Note that some non-functional aspects and an increased demand for certain functions on behalf of end-users also help explain the development of pension funds as intermediaries. We shall address these in Section V. Finally, there are wider implications for corporate financing and risk sharing when institutional investors and capital markets come to dominate (Section VI).

IV.1 Clearing and settling payments

The role of pension funds is clearly not to facilitate exchange of goods, services and assets directly. This is because, unlike banks, money market funds, and to a lesser extent long term mutual funds, they do not offer liquid liabilities. Nevertheless, pension funds have had an important indirect role in boosting the efficiency of the financial systems, by influencing the structure of securities markets. This effect on micro-structure links to their demand for liquidity, i.e. to transact in large size without moving the price against them, anonymously, and at low transactions costs⁷.

By demanding liquidity, pension funds help to generate it, firstly by their own activity in arbitrage, trading and diversification, secondly via the fact that liquidity is a form of increasing return to scale, as larger markets in which pension funds are active attract more trading, reducing costs and improving liquidity further. A third effect arises from funds' countervailing power as they press for improvements in market structure and regulation. These include deregulation and reduction in commissions, advanced communication and information systems, reliable clearing and settlements systems, and efficient trading systems, all of which help to ensure that there is efficient arbitrage between securities and scope for diversification. They also demand adequate public disclosure of information and a market-oriented accounting system. In this regard, pension funds have considerable leverage as they are extremely "footloose" and willing to transfer their trading to markets offering improved conditions. This renders the market for securities trading services "contestable", regulation permitting. Any excess profitability is vulnerable to "new entry" by other markets; and markets need to innovate (e.g. by setting up futures exchanges or electronic trading) to retain pension funds' business.

The resulting financial structure reduces volatility and bid-offer spreads and enables financial and non financial institutions to hold, obtain and transfer liquidity much more readily. Increases in liquidity

should in turn be beneficial more generally to the efficiency of capital markets, and lead to a reduction in the cost of capital, as well as diminishing the role of banks⁸ in liquidity provision.

IV.2 Provision of a mechanism for pooling of funds and subdivision of shares

Pooling and diversification is a fundamental characteristic of pension funds, given their size and consequent economies of scale. In this context, one may note the mutually reinforcing development of securitisation of individual assets (such as loans), which has provided a ready supply of assets in which pension funds may invest instead of banks holding them on their balance sheets (see also Section IV.6). In addition, participation costs to market activity may also be of major importance in determining the demand for services of pension funds.

The traditional theory of pooling suggests that transactions costs in securities markets, including the bid-ask spread and "minimum size investment barriers", make it difficult for households of average means to diversify via direct securities holdings⁹. Meanwhile, risk incurred if diversification is insufficient is not compensated by higher return, because such risk is diversifiable to the market as a whole (*Sirri and Tufano* 1995). Historically, this either meant that individuals took excessive risks or were obliged to hold lower-yielding assets such as bank deposits.

The idea of participation costs complements that of transactions costs, and helps explain why pension funds have continued to grow even as transactions costs have come down. The basic idea is that there is a fixed cost to learning about a company, and also an ongoing cost to being active in the market and remaining up-to-date, which may discourage individuals from holding sufficient shares for adequate diversification (*Allen and Santomero* 1998). Furthermore, the skills needed to undertake risk management may be too costly for individuals to acquire (*Allen and Santomero* 1999).

Pension funds offer much lower costs of diversification¹⁰ by proportional ownership. Fees for managing investments can be as low as 25 basis points for company pension funds and 100 basis points for personal pension funds. One reason for this is that there are economies of scale in large transactions, related partly to the fixed costs involved. Pension funds can also offer the possibility of investing in large denomination and indivisible assets such as property which are unavailable to small investors. Furthermore, pension funds reduce the cost of transacting by negotiating lower transactions costs and custodial fees. Professional asset management costs are shared among many households and are markedly reduced as a consequence. The direct participation costs to households of acquiring information and knowledge needed to invest in a range of assets, as well as in undertaking complex risk trading and risk management are reduced (although costs of monitoring the asset manager

remain). The net effect is that individuals are likely to switch to pension funds from direct holdings of securities and from bank deposits.

IV.3 Provision of ways to transfer economic resources

The basic *raison d'être* of pension funds arises in the context of resource transfer over time. This function does not typically entail maturity transformation, as pension funds have matched assets and liabilities. Pension funds act in an unusual manner in this regard, in that they may increase the volume of saving¹¹ *per se* besides the disposition of household funds. At a micro level, company or other obligatory pension funds can implement enforced saving by deferring wages and salaries, thereby reducing risk of a low replacement ratio. At a macro level, the increase in saving is not usually one-to-one, as increased contractual saving via pension funds is typically partly or wholly offset by declining discretionary saving¹². The remaining effect probably results from liquidity constraints on some individuals (especially the young), who are unable to borrow in order to offset obligatory saving via pension funds early in the life cycle. It can also be anticipated that, even in a liberalised financial system, credit constraints will affect lower income individuals particularly severely, as they have no assets to pledge and also have less secure employment. Therefore forced pensions saving will tend to boost their overall saving particularly markedly (Bernheim and Scholz 1992).

Abstracting from the likely increase in saving and wealth, the growth of pension funds affects financing patterns owing to differences in behaviour from the personal sector who would otherwise hold assets directly, in pursuit of transfers across time. Portfolios of pension funds vary widely, but in most cases they hold a greater proportion of capital uncertain and long term assets than households, while households have a much larger proportion of liquid assets. These differences can be explained partly by time horizons. Also as noted pension funds compensate for the increased risk, by pooling at a lower cost across assets whose returns are imperfectly correlated. The implication is that pension funds increase the supply of long term funds to capital markets, and reduce bank deposits, even abstracting from changes in aggregate saving, so long as households do not increase the liquidity of the remainder of their portfolios fully to offset growth of pension assets. Research on household asset holdings at a micro level (such as *King and Dicks-Mireaux* (1988)) found little such offsetting.

As regards transfer across space, one may highlight the increased internationalisation of portfolio investment by pension funds. This has supplanted the bank-driven flows which were typical of the 1970s. Besides the growth of pension funds *per se*, this pattern has been facilitated by easing of portfolio regulations and abolition of exchange controls as well as persistent saving/investment imbalances between countries (notably the US and Japan). As in domestic markets, pension funds

benefit from superior ability to handle information and lower average trading costs relative to individuals in carrying out such investment.

The possibility of international investment improves diversification relative to solely domestic portfolio investment which would leave pensions dependent on the performance of the domestic economy¹³. Crucially, to the extent national trade cycles are not correlated and shocks to equity markets tend to be country specific, the investment of part of the portfolio in other markets can reduce systematic risk for the same return. In the medium term, the profit share in national economies may move differentially, which implies that international investment hedges the risk of a decline in domestic profit share and hence in equity values¹⁴. And in the very long term, imperfect correlation of demographic shifts should offer protection against the effects on the domestic economy of ageing of the population¹⁵. Indeed, there are strong arguments that investment from pension funds in OECD countries should flow to countries with younger populations, where investment demands exceed national saving. Moreover, when the emerging market countries subsequently age, they may be willing buyers for assets then being sold by pension funds from OECD countries.

IV.4 Provision of ways to manage uncertainty and control risk.

Pension funds provide risk control directly to households via the forms of retirement income insurance they provide, an advantage which largely reflects the unusual (among financial intermediaries) link of pension funds to employers. To assist in undertaking this risk control function they diversify assets as noted above and also act in securities and derivatives markets to hedge and control risk. As institutional investors, pension funds are well-placed to use derivatives and other means of risk control; many innovations have been introduced or developed specifically to cater for their demand (*Bodie* 1990b, 1999).

On the liability side, *Bodie* (1990a) has formalised pension funds' function as a form of retirement income insurance. Insurance can be provided against an inadequate replacement rate, social security cuts, longevity, investment risk and (in some countries) the risk that pensions will be eroded by inflation. Defined benefit funds are particularly rich in such features, although they are not entirely absent for defined contribution. On this view, pension funds are seen as insurance subsidiaries of the sponsoring firm, and not as an integral part of the balance sheet. He suggests this approach explains a number of features of pension funds, notably provision by the employer and the historical dominance of defined benefit schemes, as well as financial policies seemingly contrary to shareholders' interests such as ad hoc increases in benefits, mandatory membership and payouts being in the form of annuities.

For both defined benefit and defined contribution funds, employer provision is partly explicable in terms of insurance aspects. Employers have superior information regarding current and future earnings, which are of key relevance to the employee's long term financial needs. They may have interests more in common with employees than have for example personal pension salesmen, given the need to maintain reputation in the labour market and - of particular importance - the fact managers and employees typically participate in the same scheme¹⁶. Company pension funds, both defined benefit and defined contribution, are also superior to insurance companies as they can reduce longevity risk by avoiding some of the adverse selection problems of private annuity insurance¹⁷. These problems arise from asymmetries of information between private insurers and those buying annuities; only those with a high life expectancy (i.e. bad risks) will tend to buy them, which induces increases in the price, and withdrawal of more of the good risks. In the limit the market may cease to function, or at least be prohibitively priced. Pension funds avoid this problem by providing a company-wide pool of good risks and bad risks for the insurer, or alternatively by providing the annuities themselves.

For defined benefit funds, companies are large and long lived, with their own income flow, assets and ability to borrow, and can therefore act as a self-insurer and smooth out losses that would otherwise be incurred by cohorts of workers who retire when investment returns are low. Where funding rules permit, such smoothing may also arise via risk transfer to younger workers who implicitly accept temporary declines in the value of assets backing their claims while pensioners receive their rights in full. A further form of insurance provided by defined benefit funds is that against factor-share uncertainty (i.e. relating to the division of GDP between wages and profits), (see *Bodie et al* (1988)). This is because they offer workers the ability to participate in an implicit security whose return is tied to the wage rate at the time of retirement, whereas defined contribution funds tie workers in to the returns on physical capital, with no stake in labour income during their retirement period.

On the asset side, risk management by pension funds links directly to the portfolio objectives (*Bodie* 1990b, 1999). For example, in order to maintain a balance between assets and liabilities in the context of minimum funding regulations for defined benefit funds, asset managers may adopt immunisation strategies such as writing call options on equities to convert them into short-term fixed-income securities for matching purposes. Also, portfolio insurance (contingent immunisation) strategies are common means of hedging against shortfall risk. One means of achieving portfolio insurance involves holding assets in excess of the legal minimum in equities, reducing their proportion when the market value of pension assets falls, entailing use of index options and futures markets and of programme trading more generally.

For all types of fund, use of derivatives may also be for controlling risk by increasing or reducing exposure to an asset class; and for cutting costs, where a large change of asset allocation is anticipated. There are uses in cash flow management, whereby positions may be adopted before assets are purchased (by buying futures and selling put and buying call options). Then there is tactical asset allocation; use of derivatives allows asset managers to change asset allocations more cheaply and rapidly than by selling or buying a large volume of assets. When managers are changed, options can be used to replicate the original position which assets are shuffled to reflect the new manager's portfolio preferences. This allows the shift to take place gradually, without incurring market liquidity problems. Finally, holding stock while selling a call option allows income enhancement.

IV.5 Providing price information

As noted, pension funds seek publication of information from companies directly, and press for market-value based accounting systems. This is of benefit to all users of the market - although it disadvantages banks, which in making loans tend to rely on private information not available to other investors.

Superior ability to employ such information is suggested by studies showing that initial public offerings that are largely subscribed by institutional investors tend to do well, while those largely purchased by the general public tend to do badly. This suggestion is also supported by econometric analysis (*Davis* 1988) of the portfolio distributions of life insurers and pension funds, which show asset holdings at a sectoral level relate strongly to relative asset returns. Such market sensitivity generates an efficient allocation of funds as pension funds, having good information and low transactions costs, speed the adjustment of asset prices to fundamentals. (This should only entail price volatility to the extent fundamentals are themselves volatile.)

In a global context, cross-border portfolio investment as outlined in Section IV.4 should enhance the efficiency of international capital markets, by equalising total real returns (and hence the cost of capital) between markets. Such a process occurs as investment managers shift between over- and undervalued markets via tactical asset allocation (utilising price information). Increased efficiency, reflected in accuracy of market prices, enables capital to flow to its most productive use and savers to maximise their returns.

By contributing to the growing diversity in types and sizes of institutions, in terms of their liabilities, incentives, and consequent attitudes to risk, the growth of pension funds should also be stabilising to financial markets, and thus assist accurate provision of price information. In the words of *BIS* (1998), a financial system's stability depends on "the coexistence of participants with divergent objectives and

mutually complementary behaviour". Diversity should be further increasing as ultimate responsibility for asset allocation is handed back to individual investors in defined contribution pension funds. Exceptions to these arguments for stabilisation could arise however (*Allen and Gorton (1993), Davis (1995b)*) if pension funds act in a herd like manner and drive prices away from fundamentals.

IV.6 Providing ways to deal with incentive problems

Pension funds have a comparative advantage over individual investors in dealing with issues of corporate governance, given the size and voting weight that they can wield. It should be stressed though that there are limits to pension funds' involvement, especially in respect of debt finance, thus leaving a role for banks. And as discussed below there are important incentive problems in the asset management relation itself, that corporate sponsors of pension funds may given their superior information and countervailing power be better placed to deal with than individuals.

Dealing with incentive problems in equity finance is one of the most crucial aspects of pension funds' activities as financial intermediaries. The basic issue in corporate governance is simply stated. Given the divorce of ownership and control in the modern corporation, principal-agent problems arise, as shareholders cannot perfectly control managers acting on their behalf. Managers, who have superior information about the firm and its prospects and at most a partial link of their compensation to the firms' profitability¹⁸, may divert funds in various ways away from those who sink equity capital in the firm, notably expropriation¹⁹ or diversion to unattractive projects from a shareholder's point of view. Principal-agent problems in equity finance imply a need for shareholders such as pension funds to exert control over management, while also remaining sufficiently distinct to let them buy and sell shares freely without breaking insider trading rules. If difficulties of corporate governance are not resolved, these market failures in turn also have implications for corporate finance in that equity will be costly and often subject to quantitative restrictions.

Effectiveness of corporate governance is typically enhanced by presence of large investors, such as pension funds. They will have the leverage to oblige managers to distribute profits to providers of external finance either directly or via the threat to sell to takeover raiders. They are needed because individual investors may find it difficult to enforce their rights, owing to difficulty of acting in a concerted manner against management and related free rider problems which make it not worthwhile for an individual to collect information and monitor management. Since pension fund stakes are typically limited to 5% of a company, they also avoid the "downside" to dominant investors, who if they own a large proportion of the company may override the interests of minority shareholders and could even reduce measured profitability²⁰ (*Morck et al 1988*).

Besides improving the quality of corporate governance, pension funds may change its nature. As is well known, countries such as Germany have traditionally featured relationship banking-based corporate governance. This typically involves companies forming relationships with a small number of creditors and equity holders. There is widespread cross shareholding among companies. Banks are significant shareholders in their own right and in Germany are represented on supervisory boards both as equity holders and as creditors. In such systems, the influence of pension funds is often limited by voting restrictions, countervailing influence of corporate shareholders and lack of detailed financial information, as well as the right of other stakeholders (employees, suppliers, creditors) to representation on boards. Implicitly, monitoring of managers is delegated to a trusted intermediary - the bank.

Foreign²¹ or domestic pension funds may transform the system by pressing for primacy of equity holders as owners of the firm over other stakeholders, improved returns on equity, a greater provision of information by firms, support of hostile take-overs and removal of underperforming managers (*Davis 1993*). This implies a greater degree of control by capital markets, and a decline in the traditional forms of governance linked to "relationship banking". Partly due to free rider problems²², securities market development could have the side effect of reducing banks' willingness to "rescue" firms in difficulty. Companies might need to reduce their leverage.

Turning to debt finance, the traditional theories of intermediation noted in Section II can be used to distinguish borrowers from banks from those accessing capital markets, and whose liabilities may hence be held by pension funds (*Davis and Mayer 1991*). Broadly speaking, these theories suggest that pension funds will only cater for a limited range of high quality borrowers with good reputations, which are thus able to issue bonds. Analysis of pension funds and banks in different OECD countries (*Davis 1995a*) suggests that these differences continue to hold, as pension funds focus mainly on government bonds and high-grade corporate bonds, while banks tend to monopolise small business financing. But boundaries are shifting, as highlighted by the development of rating agencies, junk bonds and the expanding range of securitised debt. Pension funds are tending to hold a much wider range of debt even though in some cases they delegate the monitoring to the originator, and/or to the rating agencies. Securitisation in turn lowers the cost of debt finance to the end user, given the liquidity offered compared to a loan. Even delegated monitoring is not universal; in the Netherlands pension funds are active as both lenders and monitors in the loan market.

A third type of incentive problem needs to be highlighted, namely that between asset managers and their clients (such as the pension fund or individual investors). Unless the asset manager is perfectly monitored and/or a foolproof contract drawn up, the manager may act in his own interests (e.g. in generating excessive commission income) - or in the interests of related financial institutions - and

contrary to those of the liability holders. Companies as pension-fund sponsors can overcome many of the agency problems faced by individuals in dealing directly with financial institutions, as they have considerable countervailing power against asset managers, imposing performance reviews and changing managers when dissatisfied with the results.

V Other reasons for the rise of pension funds

It has been shown in the section above that pension funds have a number of advantages in fulfilling the functions of the financial system over other types of intermediary such as banks, and over direct finance, and that these advantages help to explain their growth. However, a complete understanding of the development of pension funds as financial intermediaries requires analysis of the “non functional” effects of fiscal/social security provisions and direct benefits to the corporate sponsor, as well as of demographic developments boosting the demand for retirement income provision.

V.1 Non functional aspects

Most countries adopt an expenditure tax treatment for pension funds, exempting pension saving from taxes on contributions and asset returns, while taxing retirement income and lump sums drawn from such tax-favoured assets. Pension saving is generally treated more favourably than other institutional saving, thus leading to greater flows of saving being directed through this channel. It is clear that such fiscal provisions boost the demand for saving via pension funds. Moreover, growth of pension funds is also typically dependent on the generosity of public social security pensions. In countries such as Germany, France and Italy, where social security is relatively generous, pension fund development is less marked than elsewhere (*Davis 1997*).

Particularly for defined benefit funds, there are further aspects of the relation between the fund and the corporate sponsor which encourage firms to set up pension funds. The corporate finance perspective sees defined benefit pension fund liabilities as corporate debt, with members having a claim on the firm similar to other creditors, and fund investments as corporate assets which collateralize the pension obligation. The above mentioned tax exemption of contributions and asset returns are special features distinguishing pension from other such reserves in most countries and making funding attractive to firms as well as individuals. Corporations can be expected to manage pension funding and investment to maximise benefit to shareholders. Besides tax exemption, attractions of funding to the firm include the fact that sponsors may in certain circumstances use surplus assets as a contingency reserve.

Moreover, a funded pension scheme may attract high-quality labour, because of the insurance features²³ noted in Section IV.4 and because funding gives scope for the sponsor to offer ad hoc benefit increases when asset returns are high. Pension funds can also assist the employer by reducing labour turnover, especially if the employer is allowed to institute imperfect vesting (so that employees only accrue pension rights after several years of contributions made on their behalf²⁴). In addition, incentives to remain with a firm arise in final-salary defined benefit funds as pension accruals tend to increase with the time that the worker remains with the same firm -a phenomenon known as "backloading". This feature of defined benefit funds is also consistent with the so-called contract view of the labour market (*Lazear* 1981), whereby to encourage increasing productivity young workers are paid less than their marginal product, and older workers more, so as to increase their potential losses of deferred pay from shirking. Rising pension accruals in the context of a long-term employee relationship are both the means whereby such an earnings profile is maintained. Patterns of pension accruals may also be the means whereby older workers are induced to leave before their ratio to marginal product becomes excessive.

V.2 Demand side aspects

On the demand side, pension fund growth is explicable in terms of an increasing demand for retirement income provision in the light of the ageing of the population. There is expected to be a sharp increase in the proportion of the population aged 65 and over in OECD countries. This increase is largely a consequence of a decline in fertility to below replacement in most EU countries, although it also stems from an increase in average life expectancy and a low level of net migration. With an unchanged retirement age, such a demographic shift will naturally lead to an increase in the scope of transfers in pay-as-you-go pension systems. Besides simple cuts in social security benefits, increased funding of pensions is an important aspect of the policy response (see *Davis* 1997). This in turn will clearly increase investment via pension funds rather than in bank deposits. Even in advance of reforms, individuals in countries with generous pay-as-you-go systems are increasing their long term saving via mutual funds and life insurers, owing to expectations of future difficulties and consequent reform, and are thereby already boosting the institutionalisation of capital markets, with many of the same effects as those noted for pension funds in this article.

VI Wider systemic implications of pension fund growth

The thrust of this article has been to suggest that pension fund growth tends to boost capital market financing and drive corporate governance towards the Anglo Saxon mode. Before concluding, it is worthwhile to probe the broader consequences, which may imply changes to corporate financing and risk sharing. Research on the "best form" of corporate governance is inconclusive. *Mayer* (1996)

points out some advantages of the insider model of German relationship banking, with its focus on private information and stakeholder relationships. It may be superior at implementing policies needing consensus among stakeholders, encouraging high levels of fixed investment by the firm and of the employees in firm specific skills, in the context of long lived corporations. On the other hand, he also suggests that the outsider models in which pension funds play a greater role may be better at responding to change and building up new firms. Consistent with this, *Allen and Gale* (1995) suggest that capital market financing could well be economically beneficial with emerging industries, with high financial and economic risks and where knowledge about the new industry is uncertain (IT, biotechnology)²⁵. In contrast, relationship banking may have an advantage in industries where markets are mature and innovation and uncertainty are low, as banks can then accurately monitor and diversify risk among companies.²⁶

Taking a broader view, *Allen and Gale* (1997) show that Anglo-American capital markets dominated by institutional investors such as pension funds may have a disadvantage in terms of risk sharing, whereby competition and opportunities for arbitrage constrain intermediaries to only carry out cross-sectional risk sharing - exchanges of risk among individuals at a given point in time. This leaves individuals vulnerable to undiversifiable risks arising over time, e.g. owing to macroeconomic shocks. In contrast, financial systems where banks have some monopoly power over savers facilitate elimination of such intertemporal risks by accumulation of reserves and smoothing of returns over time. These benefits may be lost as openness to global markets increases via pension fund growth (there is an obvious application to the current situation in Germany). In Anglo-American countries, the focus on cross-sectional risk sharing may help explain the intense focus on risk management via derivatives (*Allen and Santomero* 1999). It is intriguing to note that whereas pension funds cannot assist with intertemporal risk sharing for the economy as a whole, defined benefit schemes can do so for their beneficiaries via risk transfer between generations of contributors or with the sponsor (Section IV.4), while defined contribution cannot to the same extent²⁷ (*Bodie et al* 1988).

Conclusions

It has been shown that pension funds, viewed in the light of the functional approach to financial systems, have been able to fulfil a number of functions, either directly or indirectly, more efficiently than other types of institution or than direct holdings. In this sense, pension funds may be seen as more efficient financial institutions that are tending to displace existing arrangements. They tend to complement capital markets and act as substitutes for banks. That said, it has been emphasised that growth of pension funds is also a consequence of fiscal incentives and some benefits to employers in terms of labour force management. Growth of pension funds is also driven by the growing demand arising from the ageing of the population. Pension funds will tend to grow and displace other

institutions for this reason independent of the supply side advantages. A financial system dominated by pension funds will be strong in terms of cross-sectional risk sharing but may be weaker for intertemporal risk sharing.

The study of pension funds as intermediaries in a functional context can draw on the extensive existing literature on pension economics (see *Bodie and Davis 2000*). Among the points of interest, we would stress their evolving role in corporate governance; use of new financial instruments; and the unique link to the sponsoring corporation, the last being explicable in terms of corporate finance, insurance and personnel management aspects. As noted, pension fund growth poses a particular challenge to banks, as they disintermediate funds previously intermediated through banks. They are not, however, perfect substitutes as they do not for example directly provide liquidity, and are not adapted to provide debt finance directly to borrowers for whom private information is important. Banks' response to the challenge is often to seek to profit from pension fund growth by setting up or developing their own asset management subsidiaries alongside other non-interest sources of income, as well as securitising loans.

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¹ It should be noted that many of the arguments presented here also apply to other institutional investors such as mutual funds and life insurance companies, which have grown in significance at the same time as pension funds (Davis 1996).

² For an extensive analysis of asset management and institutional investors see *Davis and Steil* (2000).

³ Only in some countries, such as the UK, is indexation after retirement obligatory for defined benefit funds.

⁴ See *Coase* (1937).

⁵ For an excellent summary, see *Bhattacharya and Thakor* (1993)

⁶ For an early assessment of information costs in an industrial economics context, see *Alchian and Demsetz* (1974)

⁷ Liquidity may be defined in terms of four dimensions; width, which is the bid-offer spread between buying and selling prices for securities transactions; depth, the amount of securities that can be traded at given bid and offer prices; immediacy, the time needed to carry out a transaction; and resiliency, the time the market needs to return to previous prices after absorbing a large trade (see *Kyle* 1985).

⁸ On the other hand, pension funds require other intermediaries to generate efficient and liquid capital markets; notably, given the role of banks in providing credit to market makers, and to underwriters, they are also essential (see *Blommestein and Spencer* 1996). Hence in this case pension funds are complementary to banks.

⁹ Typically around 40 shares are needed to offer the same volatility as the market as a whole; in the US the 'round-trip' commissions needed would amount to 12% of value, even for a person of median wealth (*Sirri and Tufano* 1995).

¹⁰ Note that the diversification is direct in the case of defined contribution funds, and indirect for defined benefit (where the assets are in effect collateral for the pension promise made by the firm).

¹¹ Note that we make no normative statement whether the increase in saving is "desirable".

¹² See *Munnell* (1986) and the review in *Smith* (1990), although note that studies such as *Hubbard* (1986) and *Poterba et al* (1996) suggest a larger effect

¹³ It also entails an additional advantage of pension funding over pay-as-you-go, which is by definition dependent on the domestic economy.

¹⁴ This will be of particular importance to defined-benefit pension funds where liabilities are tied to wages and hence rise as the profit-share falls. Similarly, at an individual firm level, investment in competitors' shares hedges against a loss of profits due to partial loss of the domestic market.

¹⁵ *Erb et al* (1997) show how asset returns vary systematically with a country's demographic characteristics, with an older population being more risk averse and demanding a higher premium on equity investment.

¹⁶ However, for defined benefit funds based on final pay, there may be transfers from those (such as workers) whose salaries have been relatively flat to those (such as managers) which have risen sharply.

¹⁷ See *Mitchell et al* (1999).

¹⁸ Performance related pay, the use of share options and similar devices may help to align managers' and shareholders' interests. But such contracts may themselves worsen the governance problem by leading to heightened incentives for self dealing, with managers negotiating such contracts when they know performance may improve.

¹⁹ Beyond theft, transfer pricing and asset sales, expropriation may take forms such as perquisites, high salaries, diversion of funds to pet projects and general entrenchment even in cases when managers are no longer competent or qualified to run the firm.

²⁰ They might for example extract rents from the firm.

²¹ The influence of foreign pension funds will depend on the relative size of the domestic sector.

²² Because equity and bond holders would benefit from banks' actions.

²³ Note in this context that funding can be seen as more secure than pay-as-you-go or reserve funding (*Direktzusagen* in Germany), because it offers better protection to members (or the government insurer), in the case of default of the corporation.

²⁴ This does not apply only to defined benefit funds - as noted by *Mitchell* (1999), even in the US, defined contribution funds as well as defined benefit often "vest" only after five years.

²⁵ It could also favour the environment of EMU, where marked structural change is underway in existing industries.

²⁷ On the other hand, simple asset accumulation as in defined contribution funds is also a means of smoothing risks over time.