

THE ROLE OF PENSION FUNDS AS INSTITUTIONAL INVESTORS IN EMERGING MARKETS

E Philip Davis¹
Brunel University and NIESR
London

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Abstract: In recent years, a growing number of Emerging Market Economies, as well as most advanced countries, have witnessed growth of pension funds as institutional investors. This has often occurred in the wake of pension reform shifting retirement income provision from pay-as-you-go to funding. The ongoing ageing of the population and financing difficulties of pay-as-you-go systems suggests that such reforms will become yet more common in the future. Accordingly, it is important to analyse the impact of institutional investment on the economy. In this context, our aim is to address the role of pension funds as institutional investors in financial development, and the wider effects of such financial development on economic performance. We note inter alia some of the ways in which the behaviour and impact of institutional investors might differ in emerging market economies from advanced countries as well as policy issues.

¹ Professor of Economics and Finance, Brunel University, Uxbridge, Middlesex UB3 4PH, United Kingdom (e-mail ‘e_philip_davis@msn.com’, website: ‘www.ephilipdavis.com’), Visiting Fellow at the National Institute of Economic and Social Research, 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. I thank Mukul Asher, Kyung-Mook Lim, Yu Wei Hu, Juan Yermo and participants at the conference for helpful comments and advice.

1 Introduction

In recent years, a growing number of Emerging Market Economies (EMEs), as well as most advanced countries, have seen rapid growth of pension funds as institutional investors, notably in the wake of pension reform shifting the finance of retirement income from pay-as-you-go to funding. The current size of pension fund sectors for EMEs is shown in Table 1, while corresponding data for advanced countries is shown in Table 2. It can be seen that for the former, average pension assets are equivalent to 12% of GDP while in the latter the ratio averages 39%. East Asian EMEs are intermediate with an average of 16%. For all countries, the ongoing ageing of the population and financing difficulties of pay-as-you-go systems suggests that pension reforms will become yet more common in the future, entailing further growth in pension funds. Proposed reforms in Korea, converting severance pay to pensions and phasing out book-reserving, are an example of this.

Accordingly, it is important to analyse the impact of pension funds and wider institutional investment on the financial markets and the economy, and whether policy actions can improve the cost and benefit balance. The financial market effect is seen of particular importance given that “well developed domestic financial markets are a critical pillar of a market based economy because they mobilise and intermediate saving, allocate price risk, absorb external financial shocks² and foster good governance through market based incentives” (Holzmann and Hinz (2005) p51). In this context, our aim is to address the role of pension funds as institutional investors in financial development, and trace the effects of such financial development on economic performance. We shall note inter alia some of the ways in which the behaviour and impact of institutional investors might differ in emerging market economies from advanced countries. Nevertheless, it is also important to focus on experience in advanced countries as it may indicate future patterns for EMEs. The paper provides some issues for further consideration in the light of Korean experience and future reform proposals, that are considered briefly in the conclusion.

1 The evolution of financial structure

As background to assessing institutional investment, it is essential to consider how financial structures evolve as countries develop. This helps us to understand the role of pension funds and their differing impact in EMEs and advanced countries. There is a widespread perception, backed by empirical observation that financial systems go through stages of development. For example, Rybczinski (1997) suggests that one can distinguish a bank, market and securitised phase. In the bank phase all finance is directed through banks, whereas securities markets and institutional investors start to develop in the market phase and become dominant in the securitised phase. Most EMEs are still in the bank-oriented

² Indeed, IMF (2003) highlights the role of local financial markets as a form of self insurance against volatile capital flows.

phase, although the most advanced such as Korea are moving to a market oriented phase – and a key argument of this paper is that pension reform can accelerate this process. Advanced countries are either in the market or securitised phase (where “securitised” implies a growing importance of securities finance generally rather than just packaging of loans in the form of securities).

Stylised facts drawn from empirical observation suggest a somewhat more complex pattern (see Allen and Gale 2000), although the idea of phases remains helpful. On average, as shown by Demirguc-Kunt and Levine (2000), banks, nonbanks and stock markets are larger, more active and more efficient in richer countries. Besides the data on pension funds per se shown in Tables 1 and 2, this is confirmed by background data on financial structure that we provide in Tables 3 and 4 for EMEs and advanced countries, respectively. Table 3 shows that for EMEs on average, private credit accounts for 50% of GDP, while stock markets are 36% of GDP, private bonds 17% and public bond stocks are 22%. In contrast, in advanced countries (Table 4) the private credit ratio is 112% of GDP, stock market capitalisation 79%, and both private and public bond markets have around 45% of GDP outstanding. East Asian countries are again intermediate between average EMEs and advanced countries, with private credit at 100%, stock markets higher than the advanced country average at 99% and bond markets smaller at around 25% each.

A further division is between countries at a similar level of development that are market oriented and bank dominated (see Table 5). Underlying the relative importance of markets and banks are aspects relating to the role of public information in markets as opposed to private information held by banks, as well as banks’ role in corporate governance. The classic distinction is between the US and UK on the one hand and most Continental European countries and Japan on the other. In this context, advanced countries are themselves bimodal in their financial structure, with the market-oriented Anglo Saxon countries having larger than average securities markets and bank-dominated countries having dominant banking sectors.

Country status in terms of bank or market focus may be partly endogenous; Demirguc-Kunt and Levine (2000) show that in advanced countries, stock markets become more active and efficient relative to banks, and there is some tendency for financial systems to become more market oriented as the countries become richer. On the other hand, Schmidt et al (1999, 2001) argue that there is path dependence, meaning that a bank based system such as Germany will not automatically develop into a market based system, owing to the institutional and legal structure that in a sense cements the bank based structure in place. However, they acknowledge that a financial crisis, perhaps triggered by “uncoordinated, far-reaching reforms” could lead to that result, because elements such as trust, implicit contracts and mutually consistent expectations which underpin relationship banking would be very difficult to rebuild after such a crisis. We argue in Davis (1993) that pension reform could also have such an effect by developing institutions unwilling to be subordinated to domestic banks and

with a strong appetite for securities. It can also be argued that in the more fluid institutional structure of EMEs, a move to market based systems away from relationship banking and bank dominance can occur more readily than in Germany in response to pension reform.

A role for legal traditions in financial development and its link to market or bank orientation has been considered by recent empirical work on law and finance. A classification of countries by legal origin is also given in Table 5 (source: Impavido et al 2003). La Porta et al (1999) show that countries with a Common Law tradition, protection of shareholders' rights, detailed accounting, low corruption and no explicit deposit insurance tend to be market based – and have large institutional sectors - whatever their income level. In contrast, countries with a French Civil Law tradition, poor protection of the rights of shareholders and creditors, poor contract enforcement and accounting standards, restrictive banking regulation, high corruption and inflation tend to have underdeveloped banks and markets – and institutions. The few countries with a German law tradition, which offers strong protection for creditors, tend to have strong bank based systems³, with small institutional investor sectors. A key issue here is whether pension funds as institutional investors can successfully press for a change in legal tradition in relevant areas, e.g. to the extent it affects their rights in respect of shareholder protection, and thereby contribute to a shift to a market-friendly legal tradition.

As regards historical trends, Rajan and Zingales (2000) show that financial development has not been monotonic. The major OECD countries were on some measures more financially developed in 1913 than 1980, and a significant reversal in financial development and financial integration took place between 1913 and 1950. A tightening of regulation in the interwar period led to a decline in the size and importance of the financial sector relative to GDP. The imposition of such “structural regulation” implied that the service provided to the non-financial sector was sub optimal, and economic growth was hindered, with for example low deposit rates and rationing of credit to households and small companies. This illustrates the danger of complacency by lawmakers in respect of financial development.

Financial liberalisation in the 1980s and 1990s has of course tended to improve financial-sector efficiency, albeit often at a cost in terms of risk. We note that growth of pension funds as institutional investors tended to precede financial liberalisation in some countries where funded pensions are long established, but has often accelerated in the wake of it, notably where there have also been pension reforms in the direction of funding. Pension fund growth clearly accompanied and spurred liberalisation in some EMEs such as Chile (Section 6) and could do so elsewhere. Institutions may help prevent reversal of liberalisation also; it can be questioned whether such regulatory tightening as occurred in the 1930s would be feasible today in the presence of large domestic and international pension funds, and the political constituency that pension funds generate for a market based system.

³ However, Table 5 suggests Korea is market based despite its legal system being of German origin.

2 Do large financial sectors promote economic growth?

The fact that advanced countries have large financial sectors tells us nothing about causality, as to whether a large or growing financial sector benefits economic development or is merely a by-product of it. A large literature has addressed the issue of the impact on economic performance of a given size and development of the overall financial sector. The classic paper on financial development and growth is King and Levine (1993) while recent contributions include Beck and Levine (2004), and Beck et al (2000). Among the commonly-used indicators are bank assets to GDP, private credit provided by deposit money banks to GDP, commercial bank asset to central bank assets, etc. On balance, both standard cross-country and more recent panel analysis confirm a positive correlation between banking, finance and the economy, allowing for not only the traditional determinants of GDP growth, such as initial school enrolment rate (Beck and Levine 2004), but also legal origins (Beck et al 2003a), resource endowment indicators, and even religious composition, etc (Beck et al 2003b).

Extending the literature beyond such bank-based indicators, Levine and Zervos (1998) found that stock market liquidity (but not size, international integration or volatility) as well as banking development were related to growth. The stock market, by facilitating long term investment, may give rise to “endogenous growth” benefits to the economy that are not present with shorter-term bank credit. Extensions such as Levine (1999) have additionally allowed for the role of certain legal aspects of securities markets (linked to creditor and investor rights, contract enforcement and accounting standards) in financial development, and found that these are crucial for economic growth more generally. This influence may operate, *inter alia*, by influencing the proportion of firms that have access to external finance (Demirguc-Kunt and Maksimovic 1998, 2000).

We note that none of these studies looked explicitly at pension funds, although they may be correlated with stock market liquidity, investor rights and accounting standards, as well as overall size of the financial sector. However, developing from this tradition and directly relevant to the issue in hand, Davis and Hu (2004) used a dataset covering 38 countries to investigate the direct link between pension assets and GDP growth, using the framework of a modified Cobb-Douglas production function with the inclusion of pension assets/GDP as a shift factor. Their rationale, as discussed in the sections below, is that pension assets can affect economic growth indirectly via financial market development (Davis and Hu 2005; Walker and Lefort 2002), or by its economy-wide impact through corporate engagement (Clark and Hebb 2003; Davis 2002a and 2004) and also – albeit not a focus of the current paper – by giving rise to less labour market distortion following pension reforms (Disney 2002, 2003)

A co-integrating relationship was found for most countries between pension assets, the capital stock and output where pension funds and output are positively related. In addition, impulse response tests in the related Vector-Error-Correction-Mechanism show that a rise in pension assets boosts output per worker initially and then follow a gradual decline, but during the whole specified period, the effect remains positive. The positive effect on output per worker of a shock to pension assets is larger in EMEs and also remains significant for longer. Furthermore, a positive average long run relationship between pension assets and output across all 38 countries is suggested by dynamic heterogeneous models and panel-based dynamic ordinary least squares models estimated with the same dataset.

3 Does it matter whether the financial system is bank or market based?

Since pension funds as institutional investors are more important in market-oriented countries, and as suggested above may be a catalyst for a shift away from a bank based system, it is also relevant to probe the comparative advantage of bank and market based systems. Several empirical papers argue that the overall development of financial services is important to growth and not its bias to bank or market financing (Levine 1997, 2000). On the micro side, research on the best form of corporate finance and governance is also inconclusive (Mayer 1996). Whereas relationship banking systems are good at monitoring and controlling debt exposures, they may also provide such funds beyond the firms' investment opportunities, leading to overinvestment when funds are abundant. In other words, whereas relationship based systems are good at control and monitoring, arm's length systems are better at governance, either via takeovers, or shareholder pressure, in both of which pension funds may be highly active (Section 5). In a similar vein, relationship banking systems ease the renegotiation of contracts, which helps overcome liquidity problems but worsens the issue of discipline, leading to so-called soft budget constraints. Arm's length systems can stop unprofitable projects more readily, given lack of long term monitoring, while liquidity difficulties are worsened.

Taking a broader view, Allen and Gale (1997) suggest that Anglo-American capital markets dominated by pension funds investors may have a disadvantage in terms of risk sharing, whereby competition and opportunities for arbitrage constrain financial intermediaries to carry out only cross-sectional risk sharing—exchanges of risk among individuals at a given point in time. This leaves individuals and companies vulnerable to undiversifiable risks arising over time, for example, owing to macroeconomic shocks, which cannot be eliminated by portfolio diversification. Furthermore, in Anglo-American countries, the focus on cross-sectional risk sharing may help to explain the intense focus on risk management via derivatives (Allen and Santomero 1999). In contrast, financial systems in which long-lived banks have some monopoly power over savers facilitate the elimination of such intertemporal risks by accumulation of reserves and smoothing of returns over time (time series risk sharing). Firms may then obtain rescue finance in recessions, for example.

On the other hand, the benefits of relationship banking in terms of lower agency costs and possibly also costs of bankruptcy can be totally offset by higher debt-equity ratios. Certainly, debt-equity ratios are much higher in bank-dominated than market oriented systems, see Byrne and Davis (2003). Again, following the suggestion that pension funds may provoke a decline of banking relationships, the benefits of “time series risk sharing” may be lost after pension reform or as openness to global pension funds increases. Notably, the way the relationship banking system requires that bank margins should widen in a recovery to recoup the “insurance premia”, may not be compatible with a competitive financial system with sizeable pension funds, where firms can access securities finance. Japan experienced this shift in the 1980s when highly-rated firms started to access bond markets, weakening the main bank link, which was part of the background for the Japanese banking crisis.

Looking at financial stability issues in bank and market oriented countries, in bank based systems, collapse of relationship banks may be highly damaging to the economy, given the dependence of the economy on these institutions. The banking crises in relationship-banking-based Scandinavia and Japan (Davis 1995a) as well as Asia in 1997 (Davis 1999a) were certainly highly damaging to the real economy. Davis and Stone (2004) show banking crises have a greater impact on corporate sector investment in EMEs, which are on average more bank dependent than advanced countries, even allowing for the standard macroeconomic determinants of investment. Meanwhile, in market-oriented countries, the so-called “multiple avenues of intermediation” are said to cushion the effect of crises in either banks or securities markets on corporate financing, since the sector that continues to function can provide corporate finance when the other sector is in crisis (Greenspan (1999), Davis and Stone (2004)). Lower debt equity ratios in market-oriented countries may also lead to greater economic and financial stability. Arguably, most securities market crises (discussed below) that can be linked to pension funds, tended to harm householders’ wealth but not the infrastructure underlying securities market functioning. Pension fund growth in this sense may aid financial stability by shifting the economy to a market basis.

4 Institutional investors and financial development – quantitative aspects

With the background of the finance and growth literature – notably the positive results for pension assets found by Davis and Hu (2004) - and also the hint that market based systems may in some sense be superior to bank based ones, we now in Sections 4 and 5 assess the specific ways in which pension funds as institutional investors may assist in financial and economic development. We shall highlight how pension funds may improve the functioning of the financial system as a whole, including its stability as well as its efficiency. We shall also note where empirical results differ between emerging markets and advanced countries and highlight the specific example of Chile in Section 6. Later, for balance, in Section 7 we also note some negative aspects of pension funds in respect of financial markets. These all give relevant information for policy analysis in Section 8.

A first key impact of pension fund growth may be via saving. It is popularly suggested that pension reform can raise overall saving in an economy, thus promoting economic development by permitting higher rates of investment. This argument needs, however, to be developed carefully, because in a life cycle model of saving and investment, households that are unconstrained will simply substitute one form of saving (e.g. pension funds) for another (such as bank deposits) with no net effect on household saving. This is particularly likely if saving via pension funds is voluntary. If saving is to be affected, there must be a market imperfection such as liquidity constraints on household borrowing that they might otherwise have undertaken to offset pension fund growth. Or alternatively, illiquidity of pension assets may mean that other household wealth may not be reduced one-to-one when pension assets increase, because households do not see such claims as a perfect substitute for liquid saving such as deposits. Note also that households may make inappropriate asset accumulation choices (i.e. inadequate saving) if they are poorly informed about their likely future pension.

The literature suggests that the impact of pension funds on personal savings is indeed greater, the more imperfect the capital markets. Reisen and Bailliu (1997), for example, used data from 11 countries over 1982-93 including both advanced countries and EMEs and found that the impact of reform on personal saving is 8 times larger for EMEs, which have more imperfect capital markets, than in advanced countries. The impact will be increased if there is a simultaneous reduction in social security pensions, since these have been shown by many authors to reduce personal saving, given the implicit asset accumulation that they entail (Rossi and Visco 1995, Feldstein 1995).

A broader question is whether growth of pension funds raises national saving, given that governments need to finance their existing pension liabilities via debt or taxes. If the government tries to finance the implicit pension debts by public debt issuance, then public savings would decrease, so the overall national saving rate might be unchanged or even fall (Cesaratto 2003). Schmidt-Hebbel (1999a) nevertheless estimated that 10% to 45% of the rise in national saving in Chile after the pension reform could be explained by pension reform, with the remainder being explained by structural reform, e.g. tax reform etc. His positive result held with a wide variety of assumptions regarding fiscal financing of the pension reform. Holzmann (1997) also gives evidence that aggregate savings in Chile grew with pension reform. Lopez-Murphy and Musalem (2004) study 50 countries and find that national saving is boosted where funds are the result of a mandatory pension programme, but not when they are voluntary. On the other hand Samwick (1999), also working with a panel of countries, who found that no countries except Chile experienced an increase in gross national saving rates after pension reform towards non-PAYG systems⁴. Furthermore, Bosworth and Burtless (2003) found that OECD countries

⁴ Note that the assessment of the impact of pension assets on growth by Davis and Hu (2004) cited above does not allow for an effect on fixed investment via saving. Focus is rather on greater economic efficiency due to pension reform.

that seek to prefund social security obligations such as Japan and the US incur offsetting increases in government borrowing that again offset any difference in national saving.

It may be concluded that a rise in personal and a fortiori national saving is not a guaranteed outcome of a pension reform. Despite this, a quantitative impact of development of pension funds on capital markets may still arise, as long as there are differences in behaviour between pension funds and the personal sector, and the personal sector does not “offset” pension funds’ portfolio choices in the manner of Modigliani and Miller (1958) for corporate finance. Pension funds in most cases hold a greater proportion of equities and bonds than households⁵, although the equity share of pension funds also varies markedly between countries, as shown in Tables 6 and 7, with EME sectors holding on average 10% and advanced countries 25%. Pension funds also tend to hold more long term bonds than households do directly.

The difference in portfolio holdings between households and pension funds can be explained partly by time horizons, which for households are relatively short, whereas given the long term nature of liabilities, pension funds may concentrate portfolios on long term assets yielding the highest returns. But given their size, pension funds also have a comparative advantage over households in compensating for the increased risk by pooling and diversifying across assets whose returns are imperfectly correlated, an advantage linked also to lower transactions costs for large deals and ability to invest in large indivisible assets such as property. Unlike banks, they tend to rely on more on public than private information in investment and hence seek relatively liquid assets. Also unlike banks, they are not subject to the risk of a “run” so can more freely invest in long term assets (Catalan et al 2000). Again, owing to economies of scale, specialisation, links to investment banks etc. their information may be typically superior to that of private individuals.

The implication is that even if saving and wealth did not increase, a switch to funding would increase the supply of long term funds to capital markets, with both quantity and price effects arising, as discussed further below. For example, there will be increases in the supply and reductions in the prices of equities, long term corporate bonds⁶ and securitised debt instruments. Such shifts should be beneficial to financial and economic development and stability, since at a basic level, long term investment projects tend to be more profitable than short term ones. More specifically, particularly for existing firms with small equity bases, there may be important competitive advantages to be reaped from equity issuance in terms of growth potential as well as reducing risks of financial distress in case of economic downturn. Furthermore, long term debt finance is correlated with higher growth for manufacturing firms (Caprio and Demirgüç-Kunt 1998).

⁵ Differences in portfolios link to a variety of factors, notably regulation and historical developments.

⁶ On the other hand, Chan-Lau (2004) notes that development of corporate bond markets in EMEs may be hindered by low liquidity, inadequate credit risk assessment, and expensive underwriting procedures. They may also be crowded out by government bonds.

In theory, there may be a shift by households towards bank deposits as pension funds grow, so as to maintain a level of liquidity. However, this is unlikely to prevent a shift of the financial sector towards long term security instruments, so long as individuals do not fully adjust the liquidity of their portfolios to fully offset effects of growth of pension funds making them “irrelevant” in a Modigliani-Miller (1958) sense. A priori, one can argue that full offsetting is unlikely, especially if pension assets are defined benefit and/or implicitly substitute for highly-illiquid implicit social security wealth. Empirical work by King and Dicks-Mireaux (1988) found no such offset for Canada, while Davis (1988) obtained similar results for the G-5. Radical change in financial structure as in Chile as pension funds grow is also inconsistent with full offsetting. On the other hand, Catalan et al (2000) suggested that an alternative pattern of portfolios could be that households adjust liquidity by reducing their non marketed and non financial assets such as unquoted shares and real estate when pension funds grow.

Supporting the idea of a shift to long term assets as pension funds grow, we observe a strong cross-sectional correlation between equity market capitalisation and the size of the pension fund sector (Table 8); for EMEs it is 0.55 and for advanced countries 0.73. EMEs also show a strong correlation for corporate bonds with pension fund assets of 0.55 which is much higher than for advanced countries (0.29). Consistent with the idea that government financing needs are the main reason for growth of government bond markets, the correlation for government bonds with pension funds is much smaller for EMEs (0.35) and negative for advanced countries, albeit sizeable in East Asia.

Such simple correlations of course tell us nothing about causality, and hence a review of recent empirical work is helpful. Concerning work on volumes of securities, Catalan et al (2000) sought to identify whether there is a Granger-causality relation between equity markets and contractual savings (i.e. that their growth temporally precedes equity market development, albeit without necessarily implying causation). They used two capital market indicators, stock market capitalisation and stock market value traded across 26 countries, among which 6 are EMEs. They gave evidence that contractual saving institutions, e.g. pension funds, Granger cause capital market’s development. The potential benefits of developing such contractual saving sectors are stronger for developing countries with small markets than for developed countries, according to their work. However, they also point out that there is no Granger causality in Malaysia and Singapore where there are centralised pension funds that do not invest heavily in domestic stocks.

In terms of bond markets, in a further cross country study, Impavido et al (2003) found a positive relationship between contractual saving assets and bond market capitalisation/GDP, with a 1 per cent increase in the former leads to 0.4 per cent rise in the latter. However, they used the value of aggregate outstanding public and private bond issuance to proxy bond market development, when the former is driven by government needs. Hu (2005) shows that in a panel error correction model that growth of

pension funds stimulates private bond finance, notably in developing countries, both in the short and long run.

Turning to effects of pension-fund growth on asset prices, a panel study focused on 33 Emerging Markets by Walker and Lefort (2002) found that pension funds decrease dividend yields and increase price to book ratio, implying a drop in the cost of equity capital. This result is robust when pension funds are proxied by four sets of variables, namely a dummy variable, the share of stock in pension portfolio, pension investment in stocks and private bonds to total market capitalisation, and pension fund assets to GDP. Other explanatory variables are inflation, per capita income, bank assets/GDP and dummy variables for the region. But when they change their econometric specification by controlling for the degree of financial integration and economic reform in different areas of the economy, some of the relations become insignificant, suggesting the impact of pension reform may be exaggerated if complementary economic reforms are disregarded.

Underlying these results, pension funds may for example promote growth of primary equity markets as they are well diversified and require a smaller risk premium for taking on IPOs; their stable demand for stocks arising from inflows makes them ready investors in IPOs, they do not require a sizeable liquidity premium as they have long term liabilities; and since they are large they can exploit economies of scale in information gathering etc.

Catalan et al (2000) suggest that a similar effect to that on dividend yields should be detectable for long term corporate debt, both in terms of the term premium and the credit risk premium. While they do not provide evidence for this, it is consistent with experience of countries such as the UK where heavy demand of pension funds for long term debt to immunise liabilities has flattened the yield curve, offering benefits to long term corporate issuers.

Turning to volatility of asset prices, in normal times pension funds, having a long time horizon, being willing to trade, having good information and facing low transactions costs, should tend to speed the adjustment of prices to fundamentals (Committee on the Global Financial System 2003). Besides reducing volatility, such market sensitivity generates an efficient allocation of funds and acts as a useful discipline on lax macroeconomic policies. Again, the liquidity that institutional activity generates may dampen volatility, as is suggested by lower average share price volatility in countries with large institutional sectors⁷. And evidence on average day-to-day asset price fluctuations shows no tendency for such volatility to increase (Davis and Steil 2001).

⁷ This is not to deny that markets may be subject to forms of excess volatility relative to fundamentals, but that the scope of average volatility does not seem to be linked to institutionalisation. See also Section 7

Walker and Lefort (2002) find that pension fund growth reduces security price volatility for 33 emerging market economies. They use 24 month annualised moving volatility as a measure of market volatility; inflation is used to proxy macro-economic stability and bank assets to proxy financial development generally. Other independent variables include per-capita income, initial conditions and regions which are used to capture heterogeneity across countries. This result implies that the risk premium on investment should itself be lower, thus benefiting corporate investment. Again, Lakonishok et al (1991) gives evidence that US pension fund managers do not “herd” except in small stocks, and the hypothesis of a positive relation between institutional holdings and share price movements does not hold, which might be due to the broad diversity of institutions’ trading styles, which to a large extent, cancel out each other’s effect. This result in fact is consistent with the words of BIS (1998): a financial system’s stability depends on “the coexistence of participants with divergent objectives and mutually complementary behaviour.”

Pension funds’ activity may also promote more stable balance sheet structures, that may in turn offer further benefits in terms of the cost of funds as well as financial stability per se. As regards the corporate sector, looking at individual company data, Impavido et al (2002b) found that in market-based economies, an increase in the proportion of shares in the contractual savings portfolio leads to a decline in firms’ leverage (which reduces risk). In bank-based economies, in contrast, it is associated with an increase in firms’ leverage (which raises risk) and debt maturity (which they argue reduces risk in a more than offsetting manner). Overall, they consider that firms are likely in both contexts to be more resilient to shocks and hence warrant a lower cost of capital. It can also be argued that banks may undertake less maturity transformation if pension funds supply the longest maturities, thus exposing themselves to a lesser risk of “runs”, while governments can issue long term debt and are at a lesser risk of refinancing crises. Overall, a country with pension funds may accordingly face a lower country-risk premium from outside lenders and investors, as it is more robust to interest rate and demand shocks.

Besides inducing shifts to longer term assets, funding would also tend to increase international portfolio investment. For EMEs, on the one hand, permitting international investment by pension funds may be seen as a loss of potential to develop domestic capital markets. It may also be seen as posing a risk of capital flight. On the other, it may be seen as beneficial to pensioners as volatility of returns could be reduced by better diversification (Davis 2005). We discuss these regulatory issues further in Section 9. In addition, international investment will forestall the point at which pension fund investment becomes so large as to face diminishing returns domestically, as for example in Switzerland, the Netherlands and Iceland. The choice of Singapore to invest pension fund assets internationally is notable in this regard. Also there may be a benefit at a national level if national income is subject to frequent terms-of-trade shocks owing to the position of being largely dependent on commodities for export earnings, while export earnings account for a large proportion of GDP, as is

common in developing countries. Hence, holdings of assets offshore can actually help to contribute to greater stability of national income (Fontaine 1997). This may in turn benefit economic growth since investment responds negatively to uncertainty (Carruth et al (2000), Byrne and Davis (2005)).

There are further institutional implications of pension fund growth that affects the depth and variety of the financial system. Notably, pension funds are complementary with the development of insurance companies for disability and annuity insurance as well as for asset management (Devesa-Carpio and Vidal-Melia (2002)). They will also commonly invest in mutual funds. But the most important question is the impact of pension funds on banks. As noted in Section 1, apart from equity market growth, the banking industry is positively linked to economic growth and financial development. A recent comparative study by Barth et al (2004) show that higher income countries are always accompanied by a larger banking industry as proxied by bank assets to GDP. For example, the average ratio of bank assets/GDP for high income countries was 344 per cent, and this figure was 91 per cent, 80 per cent and 52 per cent for upper middle income, lower upper income and lower income countries respectively. Tables 3 and 4 show similar distinctions for private credit.

As noted by Impavido et al (2002b), pension funds are competing intermediaries with banks for household saving and corporate financing, as well as via money markets as holders of money market instruments that compete with bank deposits. Such competition may increase the efficiency of the banking sector, benefiting the non-financial sector via lower spreads between the loan rate and the deposit rate. Consistent with this, we see in Table 8 that in EMEs there is a marked negative correlation between pension fund assets and spreads of around -0.3 , although it is not present in advanced countries. Security underwriting costs may also decrease owing to economies of scale and enhanced competition, thus lowering the cost of access to capital markets. Banks may respond to the associated pressure on their profits partly by increasing their focus on non-interest income – including asset management income per se, mutual funds and insurance – and reducing excess capacity by merger or branch closure. Moreover, banks may respond to more intense competition by concentrating on their core comparative advantage - that is their superior ability to monitor firms and offer loans to borrowers where information is asymmetric such as small firms. This may entail a lower maturity; as bank liabilities are liquid, this would reduce the balance sheet mismatch of the banking sector.

Pension funds may also be complementary to banks. They may purchase long term debt securities issued by banks, or could invest in long term bank deposits. Banks are essential components of capital market activity per se (as providers of collateral, clearing, settlement etc. services), and may also provide asset management and administrative services to pension funds per se. As a result of these various trends, the term-transformation risk in the banking sector may, as noted above, decrease. The development of contractual savings institutions may therefore increase the stability and efficiency of the banking system when regulation and supervision are effective.

Impavido et al (2002a) test using individual bank data over 1991-2000 in 30 countries for effects of contractual saving institutions on banks. They find that in countries with larger institutional sectors, and allowing for standard determinants of bank performance, banks offer lower spreads and thus more efficient intermediation, while also having higher profits, which the authors suggest is due to lower credit risk⁸. Contrary to the suggestion above, they offer longer maturity loans when pension funds are large, suggesting that there is complementarity in long term finance. Banks also have lower short term liabilities on average. On balance, they suggest banks are shown to be more resilient to credit and liquidity risks when pension funds are present. Note that in Section 7 below we inject a note of caution to this analysis.

Concluding this section, overall shifts to long term assets and reductions in their prices, as well as benefits to other sectors such as banking, may raise productive⁹ capital formation even if saving does not rise. Economically, efficient capital formation could in turn raise output and "endogenously", growth itself, independently of a change in saving (Holzmann 1997). The arguments here underpin the favourable results for pension assets and growth found by Davis and Hu (2004). Higher growth will feed back on saving. "Endogenous growth" effects of an increase in capital investment on labour productivity, may be particularly powerful in developing countries if a switch from pay-as-you-go to funding induces a shift from the labour-intensive and low productivity "informal" sector to the capital-intensive and high productivity "formal" sector (Corsetti and Schmidt-Hebbel 1997)¹⁰. This adds to the economic benefit of increased labour supply and demand that should result from a pension reform that increases actuarial fairness and reduces corporate social security contributions (Disney 2002, 2003).

5 Institutional investors and financial development – qualitative aspects

Besides the quantitative effects noted above, the development of pension funds is also likely to trigger qualitative developments in financial markets. These may further benefit economic growth by promoting better resource allocation. They are in general subject to positive externalities, as once instituted for or by pension funds, other investors may also benefit from them. One qualitative improvement is financial innovation, which in EMEs may include equities per se, junior markets, corporate bonds, securitisation, CDs, derivative markets¹¹ and indexed instruments. In advanced countries, defined benefit pension funds' need for hedging against shortfalls of assets against liabilities has led to the development of a number of recent financial innovations such as zero coupon bonds and

⁸ We would caution that the estimation period has not witnessed major banking problems in most countries.

⁹ This also requires allocation of funds to their most profitable uses and adequate shareholder-monitoring of the investment projects, which as detailed below should also tend to occur in capital markets dominated by pension funds owing to superior corporate governance.

¹⁰ One note of caution is that if governments force pension funds to absorb the significant issues of bonds that may be needed in a debt financed transition strategy, or if government issuance crowds out corporate issues, many of the benefits outlined will not be realised. See Section 8.

¹¹ On the development of derivatives exchanges in emerging markets see Tsetsekos and Varangis (1997).

index futures (Bodie 1990). Similarly, immunisation strategies and the development of indexation strategies by and for pension funds has increased demand for futures and options. Prowse (1998) notes the important role of pension funds in developing private equity markets.

Modernisation of the infrastructure of securities markets as required by pension funds should entail improved clearing and settlement on the one hand and provide more sensitive price information on the other, thus improving resource allocation. As a consequence it may help reduce the cost or increase the availability of capital market funds, and hence aid industrial development and growth *per se* as well as facilitating privatisations. In EMEs, pension funds' influence may be seen in terms of development of the overall market infrastructure (such as trading and settlement systems), lower transactions costs and enhancement of liquidity and transparency. In advanced countries, given their focus on liquidity¹² and lesser emphasis on investor protection, pension funds offer benefits to wholesale equity markets as opposed to heavily regulated retail markets (Steil 1996). They are footloose in their trading, and thus make the business of trading "contestable" rather than monopolistic, and facilitate its concentration. Pension funds also put pressure on cartels in bond issuance and price fixing in equity trading.

There may be important indirect benefits in this context, as pension funds press for improvements in what Greenwald and Stiglitz (1990) call the "architecture of allocative mechanisms", including better accounting, auditing, brokerage and information disclosure. Modern banking and insurance supervision, new securities and corporate laws, junior equity markets and credit rating agencies are also stimulated to develop. A related aspect of EMEs is what Walker and Lefort (2002) call "institutional capital" that is, an improved regulatory and institutional environment in which investors, firms and authorities interact, which includes corporate governance aspects as discussed below. Such improvements are crucial for financial development and growth more generally. They may be seen as entailing a move to the market phase of financial development, as set out in Section 1.

Pension funds bring increased specialisation in the investment decision making process which should aid the efficient allocation of resources. Here we have in mind economies of scale, which lead to development of better securities analysis and a research industry, and more generally lowering of costs and increased availability of information.

Development of equity markets and their dominance by pension funds would have implications not just for corporate finance - with potentially lower debt-equity ratios - but also for corporate governance, implying a greater degree of control by capital markets and pension funds (for a survey see Schleifer and Vishny (1997)). Pension funds acting for future pensioners have scope to become important representatives of minority shareholder's interests, possibly electing independent board members as well as being able to access regulators and influence public opinion. As they are large

¹² Liquidity may be less important where pension funds focus on buy-and-hold strategies, as in Chile.

investors, they may coordinate with other institutions so as to remove the free-rider problem which is normally a difficulty preventing action by minority shareholders.

In this context, the "corporate governance movement" in the US reflects dissatisfaction among pension funds with costs of the take-over mechanism, and preference for direct influence as equity holders on incumbent management (Davis 1995a, 2002a). It also links to indexation by large funds, which seek to improve the performance of firms they have to hold, as well as more generally where pension funds are very large and cannot readily sell their participations without significant market movements against them.

At present, however, the scope of such "direct influence" is limited in most EMEs; Brazil and South Africa are two exceptions (we discuss experience in Chile in Section 6). In some EMEs, such as the Philippines, there is political control of pension funds that is directly contrary to beneficial corporate governance outcomes (Asher 2000). In EMEs (and bank dominated advanced countries) greater influence may be exerted by foreign funds such as CALPERS than by domestic pension funds.

Further development of governance driven by domestic pension funds would nonetheless be beneficial to EMEs. For there is a growing literature on the impact of corporate governance initiatives on company performance, albeit mainly focusing on the effects on share prices per se. Positive results may be favourable to economic growth via efficiency gains. For example, Wahal (1996), in a sample of forty-three cases, found that efforts by institutional investors to promote organizational change via negotiation with management (as opposed to proxy proposals) are associated with gains in share prices. Strickland et al. (1996) report that firms that were targeted for pressure by the United Shareholders Association¹³ experienced positive abnormal stock returns, although corporate governance proposals per se had no effect. Gillan and Starks (2000) show that shareholder activism by U.S. public pension funds has been successful in the past 10 years, as measured by voting outcomes and stock market reaction. Faccio and Lasfer (2000) show that the monitoring role of UK pension funds is concentrated among mature and low-performing firms and that in the long run, the firms in which pension funds have large stakes markedly improve their stock returns. On the negative side, Del Guercio and Hawkins (1999) found no evidence that activism had a significant effect on US stock returns over the three years following the proposals.

All of these studies are based on micro evidence and hence only indirectly bear on the issue of whether pension funding affects wider financial development and growth. Davis (2002a) undertook macro work based on the share of equities held by pension funds and life insurers. The results are complementary to micro work if the view is taken that the effects of takeovers, institutional activism etc are not just apparent in the performance of targeted firms but also in the wider economy. This may

¹³ Note that this is actually a coalition of small investors rather than an pension fund per se.

plausibly be the case if managers of “unaffected” firms nonetheless change their behaviour in response to the threat of such action. Results were found which are consistent with a disciplining role of institutions in the Anglo Saxon countries, particularly life insurers and pension funds. The signs on their share of equity in the total are consistent with the view that they exert restraint of fixed investment (that can otherwise be wasteful if there is inadequate shareholder monitoring), and lead to a boost to dividends and to Total Factor Productivity. Furthermore, higher institutional holding is favourable to R and D (Davis 2004). The trend for corporate use of equity to rise, for equity shares of institutions to increase, and for traditional corporate governance structures to break down in Continental Europe and Japan, suggests these results could hold there in the future as well as in emerging market economies.

6 A case study of Chile

A number of these phenomena highlighted in Sections 4 and 5 above are illustrated by the experience of Chile. It provides a testbed for the effects of pension reform on a relatively simple financial system, with gradual liberalisation of pension assets, see Iglesias (1998), Schmidt Hebbel (1999b) and Acuna and Iglesias (2001)). As regards quantities, Chilean pension funds grew from zero in 1980 to 60 per cent of GDP as of 2002 (Table 1). As of 2000, 65 per cent of government debts, 12 per cent of time deposits and bank bonds, 56 per cent of mortgage bonds, 40 per cent of corporate bonds and 7 per cent of equity were held by pension funds (Walker and Lefort 2002).

Quantitatively, we have already seen that pension funds in Chile played a major role in stimulating the rise in private and national saving (Schmidt Hebbel et al (1999a))¹⁴. They also have driven growth in long term assets, and as noted now hold a significant proportion of the outstanding. Debt maturities increased as a consequence of the development of pension funds to 12-20 years by 1990. Equity investment liberalisation accompanied and encouraged a marked expansion of equity market capitalisation from 32% of GDP in 1988 to 75% in 2001; in the early 1990s, closed companies were encouraged by high P/E ratios to go public and accept standard record keeping and auditing practices, thanks to better access to pension fund financing. EBRD (1996) show that pension fund growth was accompanied inter alia by rising stocks of corporate bonds, often placed directly by large companies into pension funds, the bond market having been improved by a new risk-classification industry. The life insurance sector grew to provide annuities as well as survivorship and invalidity reinsurance as required by the new system. And other investor groups such as mutual funds and foreign investor funds have emerged, increasing the diversity of market participants.

Concerning qualitative aspects, Hansell (1992) suggests development of pension funds has been a major factor behind Chile's bonds being rated investment-grade, at that time the first Latin American

¹⁴ However, Holzmann (1997) notes that the initial effect on private saving was low or even negative.

country to be so rated since the debt crisis. Disclosure standards are reportedly higher than elsewhere in Latin America. Corporate governance is improved by requirements that pension fund managers vote for independent directors, improved information in the financial markets, increased importance of shareholder meetings, rules regulating conflicts of interest and capital market regulations generally. The recent capital market law establishes that any transaction between a buyer and a controlling group that would change control of the target company must be extended to remaining investors on a pro rata basis (IMF 2003). Holzmann (2000) suggests that pension funds have improved business management and thus productivity via better incentives than traditional ownership structures in bank groups. On the other hand, Chileans have been rather unsuccessful at ownership dispersion, one reason being unwillingness of closely held companies to accept dilution of control. Indeed, some privatised firms were taken out of the equity market after the Asian crisis of 1997-8.

Fontaine (1997) also notes that pension fund development facilitated internal resource transfers, enabling the Chilean government to service its international debts without extreme fiscal adjustment which was elsewhere damaging to the real economy, by providing a domestic source of borrowing without requiring excessively high interest rates (in fact the debt was generally CPI-indexed). Correspondingly, public sector debt rose from 5% of GDP in 1980 to 28% in 1990, a level at which it remained in 2001. Later, the demand of pension funds enabled debt conversion - by both private and public institutions - to occur smoothly. In addition, the fact that pension funds were not permitted to invest internationally till 1989, and then only in a limited way, is considered to explain why the capital markets in Chile grew in size and depth so rapidly. Again, given the existence of domestic long-term institutions and the high domestic saving that pension reform helped to stimulate, Chile is probably better insulated from the shifting behaviour of international investors, as witness the lower correction after the 1994 Mexican crisis than for other Latin American markets.

Holzmann (1997) showed econometrically that the development of financial markets in Chile correlates with strong development of the real side of the economy, via rising total factor productivity and capital accumulation. Holzmann also estimated that long term growth in Chile is 1-3% higher owing to the effects of the pension reform operating via financial markets, although he also points out that the structuring of the transition may have played an important role. The tight fiscal stance may have contributed to economic performance by crowding in of private investment and offering a higher credibility to the reform programme within and outside the country. Complementing positive results for saving cited above, Schmidt-Hebbel (1999a) reached the conclusion that pension reform in Chile boosted growth via investment and productivity. For example, pension reform contributed 0.1-0.4 per cent of the 1.5 per cent increase in TFP growth rate, while 0.4-1.5 per cent of the total 13 per cent rise in the private investment rate was attributed to pension reforms, with the remainder being explained by structural reform. The latter point is important and underlines that not all of improved economic performance can be attributed to pension reform.

Going further in this point, whereas the work noted above favours a causal role for Chilean pension funds in financial development, Uthoff (1993) argues that due to the existence of other accompanying factors, e.g. high and stable GDP growth and international capital inflows in Chile, it is difficult to prove conclusively a direct effect between pension funds and stock market development. Therefore, some researchers argue that although pension funds may have to some extent helped financial development, but they are in general neither necessary nor sufficient (Singh 1996). Equally, recent years have shown some weaknesses of the Chilean model, with low replacement rates and coverage and concentration of funds (from well over 20 in 1995 to 6 in 2004) posing a policy challenge of ensuring competition in supply (Holzmann and Hinz 2005) as well as capital market diversity.

7 Potential costs of pension fund growth for financial markets

It would be incorrect to suggest that all aspects of pension funds' influence on the financial sector are positive, although we believe there is a clear net benefit. For example, whereas we have noted above that pension funds should be beneficial in reducing equity market volatility on average, some evidence goes against this and suggests funding may increase equity price volatility and thus may raise the cost of equity capital, reducing investment.

At the level of idiosyncratic risk, Sias (1996) examined directly the relationship between the volatility of securities returns and the level of institutional ownership generally in the US. He found a positive contemporaneous relation between institutional ownership and securities volatility after accounting for capitalization.¹⁵ Possible reasons for a linkage of higher volatility to institutional ownership may include larger average trade size of institutions, which may induce volatility by overwhelming market liquidity and the greater use of program trading by pension funds. It may also reflect a greater tendency for institutions to engage in noise trading or herding.

Another study at a market-wide level was conducted by Davis (2004) who used a data set covering both pension and life insurance assets across G-7 countries. His results suggest a positive link between equity price volatility and the share of equity held by pension funds and life insurance across both Anglo-Saxon countries and Continental European countries and Japan (CEJ). He mentions, however, that such a link in the G-7 and Anglo-Saxon countries might be due to the shift in sectoral holdings of equities rather than institutional holdings per se.

Besides these average patterns, periodically some unfamiliar systemic risks may arise in institutionalised and securitised financial systems dominated by pension funds, about which regulators

¹⁵ The adjustment is needed, since institutions focus on larger stocks; the result is that within each decile of size, the stocks most held by institutions are also the most volatile.

need to learn, and which will not be captured by econometric assessments depicting long-term average behaviour. One is extreme price volatility after a shift in market expectations and asset allocations (such as the 1987 crash and ERM crisis), see Davis (1995b). Another is a protracted collapse of market liquidity and issuance after similar portfolio shifts (as for Russia/LTCM), see Davis (1994, 1999b). Both may involve a threat to banks and the non financial sector, and possibly to pension funds themselves given e.g. exposure to credit risk in real estate cycles. Both of these can give rise to costs to the wider economy from uncertainty and possible liquidity constraints on some borrowers. These “costs of financial instability” can be detected both in terms of falls in investment (Davis and Stone 2004) and in consumption (Barrell, Davis and Pomerantz 2004). As argued above, the existence of “multiple avenues of intermediation” can help to offset the impact of securities markets based crises by allowing banks to take up the slack when securities markets face difficulty as in the US in 1998. However, Davis and Ioannidis (2004) inject a note of caution, in that there may be an asymmetry – banks can take over from securities markets, but owing to the importance of bank monitoring, closure of banks may lead to extreme caution about new issues in securities markets, as in the US in 1991.

Analysis of events (Davis 1995b) suggests that such periodic market-crisis events were characterised by features such as heavy involvement of pension funds in both buying and selling waves; international investment; signs of overreaction to the fundamentals and excessive optimism prior to the crisis; at times, inappropriate monetary policies; a shock to confidence which precipitated the crisis, albeit not necessarily sufficient in itself to explain the scale of the reaction; and rapid and wholesale shifts between markets, often facilitated by financial innovations. Such patterns at an international level have been part of the background for renewed discussion of capital controls (e.g. in Malaysia and Chile) in recent years. Underlying factors behind the crises appear to be, crucially, influences on fund managers which induce herding behaviour (notably the prevalence of performance measurement¹⁶, due in turn to principal-agent incentive problems between the sponsor and the fund manager¹⁷). Regulation may itself be partly to blame - in countries such as Chile, 'herding' may also be stimulated by regulations which require pension funds to obtain similar returns.

We have highlighted above that competition from pension funds may be beneficial to the performance of the banking sector. Disintermediation of corporate finance from bank lending to capital markets, however, may also help to generate banking problems. The lessons of history from advanced countries suggest a need for vigilance, particularly if disintermediation coincides with deregulation and hence heightened competition within the banking sector that is not experienced in operating a competitive environment (Davis 1995c). This is because disintermediation historically at times led to increased

¹⁶ It is important to add, however, that the “cure” (of seeking to reduce performance pressure) may be worse than the “disease” (potential for herding). An uncompetitive fund management sector without pressure from performance assessment may actually be “value deducting”, investing in securities which do not minimise risk for given return and possibly investing client funds in a way which favours holdings of a parent institution (e.g. “front running”).

¹⁷ See Scharfstein and Stein (1990), Froot et al (1990).

risk-taking via aggressive balance sheet expansion (e.g. by lending to property developers, see Davis and Zhu 2004a and b) with risk premia which in retrospect proved to be inadequate¹⁸. An example was the Japanese banking crisis where banks, no longer able to compete with capital markets for top rated firms' borrowing, sought to maintain balance sheet expansion by lending to high risk property companies. Another is experience of other East Asian countries prior to the 1997-8 crisis (Davis 1999b). Attention to shifts in the riskiness of banks portfolios, focus on capital adequacy and the issue of excess banking capacity are warranted by regulators in this context.

Some studies suggest indeed that low competition is best for financial stability. For example, Beck et al (2003c) with a dataset from 79 countries give evidence that countries with higher banking concentration (itself not strongly related to pension funds, see Table 8) are less likely to incur banking crisis. Allen and Gale (2004), however, argue that the nature of the trade-off between competition and financial stability is more complicated than was conventionally perceived. For example, they use 6 theoretical models to identify the relationship between competition and financial stability. Some models, e.g. a contagion model are consistent with the view of this trade-off relation, while others, e.g. a general equilibrium model, suggest the co-existence of perfect competition and financial instability to ensure optimal efficiency, thus denying the conventional view of trade-off.

The above mentioned costs of financial instability are particularly marked for banking crises; estimates by Hoggarth and Saporta (2001) found that it takes 4.6 years in advanced countries but less in emerging market economies (3.3 years) before the economy returns to trend. They also found that cumulative output losses were much greater in advanced countries (23.8%) than in emerging market economies (13.9%). Banking crises alone cost 5.6% and twin crises¹⁹ 29.9%.

A related point, also implying decline of the banking sector is of concern, is that there is evidence that pension funds are reticent in investing equity in small firms, (i.e. there are limits to potential transfer of resources) despite the fact that their potential for innovation, growth and job creation is widely seen as crucial for economic growth²⁰. Sias (1996), shows that for the United States institutional holding of the largest firms on average over 1977-91 is over 47% and for the smallest, only 8%. The consequence of neglect of small firms by pension funds (assuming individual investors do not fill the gap) may be biases in the economy towards sectors with larger firms (for even if small firms can obtain bank loan finance, growth potential via debt is likely to be more restricted than with equity in addition). This may be contrary to the comparative advantage of the economy as a whole. It suggests a need for

¹⁸ It may be added that rapid economic growth and at times inappropriate monetary policy also played a role in this typical late 1980s pattern.

¹⁹ Defined as cases where a currency crisis occurs within the period of the banking crisis.

²⁰ This tendency may link to illiquidity or lack of marketability of shares, levels of risk which may be difficult to diversify away, difficulty and costs of researching firms without track records and limits on the proportion of a firm's equity that may be held. There are also free rider problems for monitoring small firms. The development and improvement of stock markets for small company shares is one initiative that may make such holdings more attractive to pension funds.

venture capital funds, junior equity markets and appropriate pension fund regulation as well as an ongoing role for banks.

As is the case for excess volatility as outlined above, regular performance evaluation of pension fund managers by trustees is said to underpin the short-termist hypothesis, (entailing under-valuation by pension funds of firms with good earnings prospects and willingness of funds to sell shares in take-over battles). This in turn is held to discourage long term investment or R&D as opposed to distribution of dividends, which would imply a suboptimal transfer and allocation of resources. Schleifer and Vishny (1990) provide an empirical model suggesting that short time horizons are an equilibrium property of capital markets, owing to the higher cost of long-term than short-term arbitrage²¹. Empirical research seems to confirm the existence of short termist effects in the UK, with overvaluation of profits in the short term (Miles 1993). Evidence from a survey of US CEOs goes in the same direction (Poterba and Summers 1992) Against this, Marsh (1990) notes that in the absence of information relevant to valuations, excessive turnover will hurt performance of asset managers, and reaction to relevant information on firms' long term prospects, which itself generates turnover, is a key function of markets. High stock-market ratings of drug companies, with large research expenditures and long product lead times, would seem to tell against the short-termist hypothesis.

8 Regulatory preconditions for benefits from pension funds to be realised

There are a number of preconditions for the realisation of the net benefits of pension funds as institutional investors for the capital markets (Vittas 2000). One is macroeconomic stability – long term financing will be unattractive if there is too much instability. In the worst situations of hyperinflation, pension funds may cease to be viable. Second, there must be a political will to adjust capital market laws and regulations to suit pension funds' needs, as well as to develop core regulatory and supervisory systems consistent with pension funds (Holzmann and Hinz 2005). Third, there is a need for sound banks and other financial institutions to offer asset management and administrative services (although these need not be domestic institutions). Fourth, and the main focus of this section, pension funds must not be unduly constrained in their investment choices nor driven by political as opposed to economic imperatives. The issue for constraint of investment links to portfolio regulations, notably for decentralised funds (although asset allocation may also be driven by other regulations such as funding rules and benefit guarantees). The issue of political control latter links to the most closely to the control regime for centralised pension funds.

Quantitative regulation of portfolio distributions seeks ostensibly to protect pension fund beneficiaries against “imprudent” investments. In this context, limits are often imposed on holdings of assets with

²¹ It is interesting to add that Von Thadden (1992) has noted that bank monitoring can in theory increase investment time horizons by enabling banks to detect at an early stage whether projects will be viable. This argument implies that a weakening of "relationship banking" may induce a further shortening of time horizons.

relatively volatile nominal returns, such as equities and property, as well as foreign assets, even if their mean return is relatively high. On the other hand, explicit allowance is by definition not made for potentially offsetting correlations between types of financial instrument. It thereby overrides the free choice of investments. The opposing model for liberal regulation is the prudent person rule which enjoins prudent diversification. Most EMEs have quantitative restrictions on equity and international investment, as reflected in low holdings of equities (and foreign assets) and high holdings of short term assets and government bonds as shown in Table 6. In the advanced countries (Table 7), there is a marked difference in portfolios of countries with prudent person rules such as the UK, US and the Netherlands compared to others, with much higher equity holdings in the “prudent person” countries.

The most crucial point in the current context is that quantitative restrictions will limit the benefits to the capital markets from the development of pension funds. This applies to overall development of securities, but also in terms of bias, whereby limits on equity holdings for pension funds may lead to corporate sectors becoming excessively leveraged. And furthermore, as pointed out by European Commission (1999) with such restrictions there is no incentive for the institutional investor to nominate investment managers with skills to achieve higher return and lower risk, by equity and international investment; competition among asset managers is discouraged if their main function is to meet quantitative asset restrictions; and the development of the asset management industry per se is likely to be set back, especially if entry by foreign managers is restricted. As a consequence of these aspects, quantitative restrictions may lead to inefficient allocation of capital and hence hold back economic growth and employment; in particular, limits on unquoted shares and venture capital (including limits on the proportion of a firm’s equity that can be held) can hinder the dynamic small firm sector, which generates the bulk of new employment. Regulations also increase costs for employers providing pensions or life insurance, hindering job creation.

In the extreme case of restrictions which explicitly or implicitly²² oblige pension funds to invest in government bonds, which must themselves be repaid from taxation, there may be no benefit to capital formation and the “funded” plans may at a macroeconomic level be virtually equivalent to pay-as-you-go, as future generations must finance the bonds (Asher 2000). We note from Table 3 that EME pension funds hold 46% of their assets in government bonds, giving rise to sizeable political risk in some countries. Holdings of government debt are vulnerable to monetisation as governments create inflation to reduce the debt burden. A notable feature of the recent Argentine crisis was the government forcing pension funds to hold its bonds, which promptly incurred massive capital losses.

Quite apart from the impact on financial development, notably for advanced countries, apart from the control of self investment, the degree to which quantitative regulations actually contribute to benefit security is open to doubt, since pension funds, unlike insurance companies, may face the risk of increasing liabilities as well as the risk of holding assets, and hence need to trade volatility with

²² For example, by closing down all alternative investment strategies such as international diversification.

return²³. Moreover, appropriate diversification of assets can eliminate any idiosyncratic risk from holding an individual security or type of asset, thus minimising the increase in risk. Davis (2002b) investigates this issue and shows that pension funds in advanced countries with portfolio regulations gained significantly lower returns than those with prudent person rules, often with higher risk.

Besides the risk-return trade-off, quantitative limits will also prevent appropriate account being taken of the duration of the liabilities (which may differ sharply between funds, as well as over time), and related changes in risk aversion; and they may render difficult or impossible the application of appropriate immunisation or asset-liability management techniques for maturity matching, because such techniques may require sharp variations in the portfolio between equities to bonds, and use of derivatives.

Again, if national cycles and markets are imperfectly correlated, international investment will reduce otherwise undiversifiable or "systematic" risk. Such risks are particularly high in EMEs with relatively undiversified economies and less developed capital markets, and pose a direct threat to retirement income security. Srinivas and Yermo (2000) assessed returns available in Latin America and found that over 1976-1999 pension funds in Argentina, Chile and Peru would have benefited from international investment by higher risk adjusted returns. Davis (2005) investigated international investment returns and risks for advanced countries and found similar results.

Some possible exceptions may be made to this argument against restrictions, notably on international investment, in EMEs with emerging securities markets. There could be a rationale for portfolio regulations initially (as was the case in Chile) if fund managers as well as regulators are highly inexperienced and the markets volatile and open to manipulation by insiders. Investors may need to be prevented from taking excessive risks. If securities markets are not yet developed, there may be a need for initial investment in government bonds, corporate loans and corporate bonds. Also compliance with portfolio limits is more readily verified and monitored than for prudent person rules. One key aspect may be that such regulations should not impose minimum requirements on holdings of certain assets, which may lead pension reserves to be used as a captive source of government financing. Following the general case above, regulation should become more liberal as financial markets become more sophisticated and mature as in Chile (Section 6).

Further issues arise in the context of capital outflow controls in developing countries. As noted by Fontaine (1997), exchange controls have in the past been - justifiably - imposed during foreign exchange crises to deal with capital flight, to avoid a sharp and costly overshooting of the currency, but often kept in looser form once normal conditions were re-established. On the other hand, Bodie and Merton (2001) show that it would be feasible to gain the diversification benefits of international investment without risk of capital flight by use of appropriate swap contracts.

²³ Indeed, in several countries, a false parallel seems to be drawn by regulators between life insurers and pension funds.

Some would also argue that international investment restrictions are needed to boost development of domestic capital markets and hence growth. Most EMEs restrict international investment, no doubt partly for this reason. The interrelation of developed capital markets with international investment is stressed by Karacadeg et al (2003) who suggest that a developed domestic financial market facilitates full current account convertibility, including the capacity to diversify pension assets internationally. Certainly, we have shown above that capital markets contribute to economic growth and pension funds contribute to capital markets. But it is less clear that this is only the case if foreign investment is restricted. Arguably, even if pension funds can aid growth of capital markets, openness to foreign investment may also achieve this objective. Assuming sound and transparent economic policy, competition and financial regulation, inward investment would itself be encouraged by allowing international investment by domestic institutions, because it would give foreign investors confidence that the repatriation of their portfolios will not itself be restricted in future.

Meanwhile, home bias even in the absence of such restrictions would lead to ample inflows to domestic instruments (Reisen 1997). The argument for international investment restrictions is in our view particularly weak where there is ample domestic saving for financing domestic investment. Indeed, as noted, international investment can in some circumstances be a safety valve where prevention of outflows might lead to undesirable currency appreciation; equally international investment will forestall the point at which pension fund investment becomes so large as to face diminishing returns domestically²⁴. Note as a corollary that decumulation of large pension or trust funds is likely to be feasible without turbulence in global markets but could generate asset price collapses in domestic markets.

The discussion above relates to regulations on decentralised schemes. Whereas such schemes are vulnerable to political interference, these are magnified if the management is centralised (Thompson 1992). In some cases, the effects of politicisation may be so severe that the benefits of funding for the capital markets as well as for pensioners are not realised. Notably, its management could be subject to political interference. Investment in government bonds, which is typical of such funds, has ambiguous consequences. Funds which are accumulated may simply be used to finance government consumption this leaving no assets to pay pensions. Even if used to fund investment, finance may be diverted to unprofitable projects for political reasons. Government bonds which are not indexed are vulnerable to monetisation by inflation. Sole investment in government bonds does not develop corporate bond or equity markets, nor indeed if the bonds are little traded, does it even help with a secondary market in government debt. Investment in domestic equity, if the fund is large, may entail corporate governance problems of government control. Also lack of international investment, which is typical of social security trust funds, leaves them dependent on the performance of the domestic economy. At a macro

²⁴ Chan-Lau (2005) notes that EME markets may have become prone to asset price bubbles after pension reforms, as increased assets chase a limited number of securities.

level, a large provident or trust fund may induce fiscal laxity, thus actually reducing national saving as in the US.

As an example, although investment is believed to be relatively efficient²⁵, political risk manifests itself in the Singaporean CPF first, in terms of a total lack of transparency in actual investments, extent of diversification and the returns realised, and second, in terms of the pre-emption of a significant proportion of the realised rate of return on the (foreign) investments of the CPF by the government. In Malaysia, funds of the centralised EPF have apparently been used to finance government sponsored privatisation and infrastructure projects, mainly via corporate bonds, which may entail inefficient resource allocation; it is being allowed to provide financing for housing at what may be subsidised rates; it was mooted to use the EPF to support the stock exchange; and to recapitalise distressed banks and companies in financial difficulties (Asher 1998). Asher (2001) notes that the decentralised design of the system in Hong Kong is likely to provide superior returns.

Similar political-risk problems may afflict public pension plans in advanced countries. Mitchell and Hsin (1994) noted that public pension plans at a state and local level in the US were often obliged to devote a proportion of assets to state specific projects to "build a stronger job and tax base". These funds in turn tended to earn lower overall returns than others, suggesting inefficient investment. Again, public pension plans in both the US and UK tended to earn lower returns than their private sector counterparts over long periods (Davis 1995a). His estimates suggested that returns were 70 basis points lower for UK local authority funds than for private funds and 150 basis points lower for US state and local funds than for private ones. On balance, we do not consider the centralised model to be appropriate for either EMEs or advanced countries²⁶.

Conclusions

We have seen that pension funds can make a marked contribution to the development of financial markets, helping to move the economy from the bank to the market phase of financial development. This in turn may speed the rate of economic growth. There are both quantitative and qualitative benefits to financial markets, only partly offset by certain potential costs. On the other hand, the scope of regulation may limit these benefits, notably if regulations markedly restrict investment in equities, and, we argue, international assets. Such regulations may also be counter productive in raising risk for pension fund members. While all economies differ, we contend that the Chilean approach of gradual easing of such regulations is a sensible one that should be adopted elsewhere. Centralisation of asset management by the government is best avoided inter alia owing to political risks, impact on corporate governance and lack of impetus to capital market development as set out in Section 8.

²⁵ As noted by Iglesias and Palacios (2001), the cases cited are the few relatively successful provident funds – most others have negative real returns over the medium term.

²⁶ Holzmann and Hinz (2005) note some criteria for avoiding the worst failings of centralised funds, and note that reforms in Canada, New Zealand, Ireland and Norway offer potentially successful models (Musalem and Palacios 2004).

It is not the purpose of this article to go into detail on the domestic situation in Korea. Nevertheless, we note (1) that there are rising asset stocks from the National Pension System, while further reform involving more funding and equity investment could occur in the future (Gruenwald 2003); (2) that the system of mainly book-reserved severance pay systems may be transformed on a voluntary basis into a pension scheme where book reserving is to be gradually phased out; and (3) personal pensions have grown rapidly and are expected to be improved further in terms of taxation and regulation. Combined with the ageing of the population, rapid growth in pension funds is accordingly in prospect. Among the potential issues raised are the following:

- Can the management of the NPS be decentralised?
- Should Korea consider mandatory funding of the second pillar at the occupational level, as in Australia and Switzerland?
- Should the current portfolio regulations be replaced with prudent person rules permitting international investment over the current limit?
- Would it be better to hold more foreign assets in pension funds rather than the central bank? Would international investment be a better way to handle accumulation and decumulation in the NPS?
- What should be the role of Korean pension funds in corporate governance?
- What is the greatest need in terms of capital market development, which pension funds could assist? Is it equity markets? Or is there also a need for further corporate bond market development, despite the large volume of bonds outstanding²⁷? Should the focus be SME financing (as suggested by IMF 2005) rather than for large companies?
- How will Korean banks react to disintermediation by pension funds?
- Is there a need for annuity market development, which could also boost demand for long term corporate and government bonds?
- Can pension funds aid in the development of a system of mortgage finance, for example by offering a market for long term securitised mortgage bonds?
- What development is needed in the regulatory structure for pension funds and complementary institutions?
- How relevant is the research literature, focused on advanced countries or Latin America, for Korean pension funds and capital markets?

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²⁷ IMF (2005) note that corporate bond market liquidity is low and credit spreads compressed, suggesting a need for financial development promoted by pension funds – and, they suggest, less government bailouts of investors. It can also be argued that foreign currency borrowing would be less if longer maturity bond funding was available, a process in which pension funds could assist.

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Table 1. Total assets of pension funds within EMEs

	Total assets (US\$ million)	As % of GDP	Year of observation
Argentina	15328	11.8	2003
Bolivia	1258	15.7	2003
Brazil	64444	13.1	2003
Bulgaria	134	0.7	2003
Chile	39672	54.8	2003
Colombia	6403	8.3	2003
Costa Rica	218	1.2	2003
Czch Republic	1487	1.7	2001
Dominican Republic	184	1.2	2002
Ecuador	16	0.1	2003
Estonia	1012	14.7	2002
Fiji	1561	69.3	2003
Honduras	7	0.1	2003
Hong Kong	27682	17.1	2002
Hungary	780	0.9	2003
Indonesia	278	0.1	2002
Kazakhstan	2631	8.8	2003
Korea	13290	2.2	2001
Sri Lanka	2698	14.6	2000
Mexico	35405	5.7	2003
Malaysia	58476	56.7	2003
Pakistan	1143	1.7	2003
Panama	464	3.6	2003
Peru	5296	8.7	2003
Philippines	3077	3.8	2003
Poland	20586	9.8	2004
Russia	2737	0.6	2003
Singapore	60877	66.6	2003
Slovakia	1572	6.0	2003
Slovenia	83	0.4	2002
Thailand	10176	8.8	2002
Ukraine	5	0.0	2003
Uruguay	1149	10.3	2003
Total assets within EMEs	390358	12.0	
East Asian EMEs	115381	16.4	

Source: Hu (2005)

Table 2: Total assets of pension funds within advanced countries

	Total assets (US\$ mn)	As % of GDP	Year
Australia	368370	58.1	2003
Austria	7063	3.7	2001
Belgium	12470	5.4	2001
Canada	393950	47.2	2003
Switzerland	246425	79.6	2003
Germany	60531	3.3	2001
Denmark	56932	26.8	2003
Spain	58145	7.0	2003
UK	1242320	69.2	2003
Iceland	15949	128.6	2004
Italy	47290	4.3	2001
Japan	2996724	69.3	2003
Netherlands	575496	112.5	2003
Norway	9102	5.5	2001
New Zealand	4192	5.5	2003
Portugal	12299	11.2	2001
Sweden	54180	23.7	2000
US	8834800	81.2	2004
Total assets within OECD countries	15000283	39.2	

Source: Hu (2005)

Data for Japan includes social security funds

Table 3. Financial structure within EMEs (as of 2002)

	Private credit by deposit money banks and other financial institutions to GDP	Concentration	Net Interest Margin	Stock market capitalization to GDP	Private bond market capitalization to GDP	Public bond market capitalization to GDP
Argentina	0.231	0.251	0.087	Na	0.050	0.108
Bolivia	0.564	0.506	0.067	0.104	Na	Na
Brazil	0.343	0.300	0.102	0.276	0.100	0.513
Bulgaria	0.124	0.516	0.048	0.001	Na	na
Chile	0.721	0.228	0.053	0.746	0.223	0.305
Colombia	0.254	0.339	0.049	0.073	Na	Na
Costa Rica	0.250	0.331	0.068	0.054	Na	na
Czech republic	0.454	0.476	0.031	0.139	0.096	0.341
Dominican Republic	0.320	0.570	0.108	Na	Na	Na
Ecuador	0.320	0.351	0.061	0.050	Na	na
Estonia	0.253	0.805	0.040	Na	Na	Na
Fiji	na	na	na	Na	Na	na
Honduras	0.394	0.326	0.076	na	Na	Na
Hong Kong	1.567	0.523	0.033	2.986	0.180	0.089
Hungary	0.317	0.360	0.055	0.113	0.021	0.330
Indonesia	0.192	0.525	0.044	0.077	Na	Na
Kazakhstan	0.124	0.690	0.075	Na	Na	na
Korea	1.330	0.312	0.023	0.425	0.491	0.180
Sri Lanka	0.276	0.524	0.034	0.051	Na	Na
Mexico	0.118	0.414	0.082	0.092	0.023	0.109
Malaysia	1.378	0.300	0.027	1.320	0.558	0.346
Pakistan	0.263	0.574	0.035	0.079	Na	Na
Panama	1.040	0.253	0.035	0.227	Na	Na
Peru	0.250	0.306	0.088	0.163	0.042	0.030
Philippines	0.404	0.419	0.038	0.506	0.012	0.284
Poland	0.276	0.369	0.032	0.095	Na	0.218
Russia	Na	0.217	0.064	0.158	Na	0.021
Singapore	1.216	0.614	0.024	1.350	0.243	0.318
Slovakia	0.273	0.606	0.028	0.025	na	Na
Slovenia	0.358	0.562	0.033	0.098	na	na
Thailand	0.952	0.307	0.017	0.264	0.142	0.154
Ukraine	Na	0.428	0.088	na	na	Na
Uruguay	0.520	0.312	0.060	0.007	na	na
Overall average	0.503	0.425	0.053	0.365	0.168	0.223
East Asian EMEs	1.006	0.429	0.029	0.990	0.271	0.229

Source: World Bank (2003)

Table 4: Financial structure within advanced countries (as of 2000)

	Private credit by deposit money banks and other financial institutions to GDP	Concentration	Net Interest Margin	Stock market capitalization to GDP	Private bond market capitalization to GDP	Public bond market capitalization to GDP
Australia	0.895	0.411	0.073	0.867	0.287	0.182
Austria	1.035	0.716	0.026	0.124	0.332	0.472
Belgium	0.779	0.703	0.021	0.649	0.415	0.961
Canada	0.823	0.520	0.026	0.950	0.235	0.596
Switzerland	1.606	0.833	0.022	2.277	0.415	0.222
Germany	1.203	0.481	0.026	0.543	0.552	0.327
Denmark	1.385	0.696	0.044	0.537	1.073	0.473
Spain	1.004	0.571	0.033	0.715	0.148	0.475
UK	1.324	0.269	0.022	1.441	0.347	0.297
Iceland	0.967	0.525	0.031	0.444	0.833	0.151
Italy	0.769	0.287	0.033	0.510	0.348	0.885
Japan	1.092	0.191	0.029	0.559	0.496	0.955
Netherlands	1.376	0.816	0.021	1.238	0.500	0.428
Norway	0.843	0.736	0.025	0.345	0.200	0.158
New Zealand	1.117	0.334	0.018	0.311	na	0.279
Portugal	1.384	0.525	0.021	0.417	0.247	0.362
Sweden	Na	0.606	0.025	1.145	0.411	0.450
US	1.448	0.273	0.044	1.229	1.078	0.415
Average	1.121	0.527	0.03	0.794	0.466	0.449

Source: World Bank (2003)

Table 5: Characteristics of financial systems

country	Legal origin	Bank-based	Market-based	Low developed	Antidirector rights
Argentina	F	0	0	1 (B)	4
Australia	CL	0	1	0	4
Austria	G	1	0	0	2
Belgium	F	1	0	0	0
Brazil	F	0	0	1 (M)	3
Canada	CL	0	1	0	5
Chile	F	0	0	1 (C)	5
Denmark	SC	0	0	1 (M)	2
Finland	SC	1	0	0	3
France	F	1	0	0	3
Germany	G	1	0	0	1
Greece	F	0	0	1 (B)	2
Hungary	G	0	0	1 (.)	3
India	CL	0	0	1 (B)	5
Ireland	CL	0	0	1 (B)	4
Italy	F	1	0	0	1
Japan	G	1	0	0	4
Korea (South)	G	0	1	0	2
Malaysia	CL	0	1	0	3
Mexico	F	0	0	1 (M)	1
Netherlands	F	0	1	0	2
New Zealand	CL	1	0	0	4
Norway	SC	1	0	0	4
Portugal	F	1	0	0	3
Singapore	CL	0	1	0	4
South Africa	CL	0	1	0	5
Spain	F	1	0	0	4
Sri Lanka	CL	0	0	1 (B)	3
Sweden	SC	0	1	0	3
Switzerland	G	0	1	0	2
Thailand	F	0	1	0	2
Turkey	F	0	0	1 (M)	2
United Kingdom	CL	0	1	0	5
United States	CL	0	1	0	5

Source, Impavido et al (2003). Key: F: French Origin, G: German Origin, SC: Scandinavian Origin, CL: Common Law
 B : Bank-based, M: Market-based financial systems

Table 6. Portfolio distribution of pension funds within EMEs (as of 2002)

	Cash	Govt bonds	Corp bonds	Shares	Real estate	Other
Argentina	15.6	56.0	2.8	12.3	Na	13.3
Bulgaria	27.8	62.2	7.0	0.2	2.8	0
Bolivia	23.2	69.5	3.7	0.0	na	3.6
Brazil	44.2	14.9	2.2	15.9	6.7	16.1
Bulgaria	27.8	62.2	7.0	0.2	2.8	0
Chile	35.1	35.7	4.0	11.6	Na	13.6
Colombia	28.6	50.1	14.5	2.4	na	4.4
Costa Rica	na	na	na	na	na	na
Czech Republic	14.8	49.9	na	6.2	0.9	28.2
Dominican Republic	na	na	na	na	na	na
Ecuador	na	na	na	na	na	na
Estonia	14.9	34.0	26.1	11.4	0.0	13.6
Fiji	na	na	na	na	na	na
Honduras	na	na	na	na	na	na
Hong Kong	12.5	23.9	na	42.4	Na	21.2
Hungary	4.4	68.1	5.2	8.7	0.0	13.6
Indonesia	70.9	0.1	11.9	4.1	6.0	7
Kazakhstan	9.7	48.8	33.7	5.0	Na	2.8
Korea	1.3	6.0	39.3	0.5	Na	52.9
Sri Lanka	na	na	na	na	na	na
Mexico	0.2	85.4	14.4	0.0	0.0	0
Malaysia	30.0	34.0	21.0	16.0	1.0	0
Pakistan	na	na	na	na	na	na
Panama	na	na	na	na	na	na
Peru	34.0	9.0	18.6	29.0	na	9.4
Philippines	na	na	na	na	na	na
Poland	4.2	66.8	1.2	27.8	0.0	0
Russia	na	na	na	na	na	na
Singapore	2.7	96.4	0.0	0.0	0.2	0.7
Slovakia	na	na	na	na	na	na
Ukraine	na	na	na	na	na	na
Uruguay	34.9	61.4	1.9	9.3	Na	0
Overall Average	21.5	45.9	12.2	10.7	1.8	10.5
East Asian EMEs	23.5	32.1	18.1	12.6	2.4	16.4

Source: OECD (2004)

Table 7: Portfolio distribution of pension funds within advanced countries (as of 2002)

	Cash	Govt bonds	Corp bonds	Shares	Real estate	Other
Australia	14.8	4.4	4.1	42.5	6.5	27.7
Austria	2.0	74.5	na	13.4	0.4	9.7
Belgium	4.4	13.6	3.2	14.6	11.1	53.1
Canada	4.9	26.6	0.8	28.7	4.2	34.8
Switzerland	7.1	26.8	na	26.5	10.5	29.1
Germany	2.3	41.4	0.0	15.8	6.4	34.1
Denmark	0.2	27.6	31.3	27.6	2.8	10.5
Spain	4.7	37.2	20.9	19.6	0.2	17.4
UK	2.6	14.5	4.7	53.8	4.3	20.1
Iceland	2.2	39.6	15.9	25.8	0.2	16.3
Italy	13.5	49.1	0.8	8.6	16.4	11.6
Japan	4.0	27.0	9.0	21.7	Na	38.3
Netherlands	0.0	0.0	36.2	47.8	4.8	11.2
Norway	4.6	Na	na	19.2	5.8	70.4
New Zealand	na	Na	na	na	na	na
Portugal	12.0	25.2	23.5	16.7	8.6	14
Sweden	na	Na	na	na	na	na
US	3.9	5.2	5.6	23.9	1.2	60.2
Average	5.2	27.5	12.0	25.4	5.6	28.7

Source: OECD (2004)

Memo: Foreign assets for Australia 20.9% and Japan 28.0%

Table 8: Correlations between pension assets/GDP and financial structure

	Private credit by deposit money banks and other financial institutions to GDP	Concentration	Net Interest Margin	Stock market capitalization to GDP	Private bond market capitalization to GDP	Public bond market capitalization to GDP
EMEs	0.545	-0.007	-0.267	0.546	0.529	0.348
East Asian EMEs	0.499	0.235	-0.339	0.405	0.386	0.670
Advanced countries	0.504	0.121	0.000	0.727	0.287	-0.293