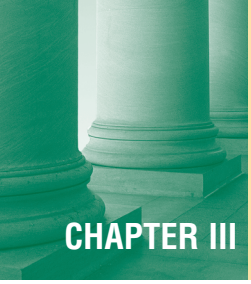


CHAPTER III RISK MANAGEMENT AND THE PENSION FUND INDUSTRY

As financial markets develop, a variety of nonbank institutions, such as insurers, pension funds, mutual funds, and hedge funds, have been increasing their exposure to market and credit risks. This chapter is the second in a series on the financial stability implications of this reallocation and transfer of risk, following the chapter, "Risk Transfer and the Insurance Industry," in the April 2004 GFSR. This chapter focuses on pension funds, as significant institutional investors.

Pension funds have an impact on the stability of financial markets in several ways, most significantly through their investment behavior. The global size and projected growth of the pension fund sector mean that this investor class can move markets in its own right. Any sizable reallocation of assets, say between fixed income and equities, could have a bearing on financial market stability. Such strategies are not only driven by fundamental business models but also by cyclical factors and risk management considerations, as well as by official policies in areas such as taxation, regulation, and financial accounting. The changing needs of aging pension fund members also have a longer-run impact. As such, an analysis of the pension funds' impact on financial stability will have to cover all of the above elements.

This chapter looks at the longer-term challenges pension funds face as populations age, and the key issues to address in order to enhance their risk management practices and their role as long-term investors. The chapter focuses primarily on Japan, the Netherlands, Switzerland, the United Kingdom, and the United States, where funded pension plans are most developed. The size of pension savings in these countries, their projected growth (whether managed by the state, corporations, or individuals), and the more recent development of funded pension schemes in other countries, such as France, Germany, and Italy, highlight the fast-growing importance of pension funds for international capital markets and to financial stability.

How pension funds manage risk has a very important bearing on the distribution of financial and other risks among the different sectors of the economy. As employers and governments have become more aware of the funding challenges pension funds face from aging populations, and more conscious of the investment risks involved in funded pension plans, they have sought to manage that risk in a variety of ways. Reductions in state pension benefits in most countries, and movements from defined benefit (DB) to defined contribution (DC) pension plans by many businesses, have increasingly transferred retirement risk (including investment, market, longevity risks, etc.) to the household sector.[1]

National pension systems are typically represented by a "multi-pillar" structure, with the sources of retirement income derived from a mixture of government, employment, and individual savings. A variety of definitions of the pillars are used in academic literature, generally dependent on the purpose of each study. In this chapter, we identify and discuss three pillars, based primarily on the source of

[1]Defined benefit schemes are those in which the employer commits to provide specific benefits related to an individual's wages and length of employment, while under defined contribution plans the commitment is to make specific contributions to a pension fund, with the benefits dependent on the level of contributions to the scheme and the investment return. For definitions of other pension terminology see the glossary.

savings (i.e., government, employment, or individual): *Pillar 1*—the state, often a combination of a universal entitlement and an earnings-related component; *Pillar 2*—occupational pension funds, increasingly funded, organized at the workplace (e.g., DB and DC, and newer hybrid schemes); and *Pillar 3*—private savings plans and products for individuals, often tax-advantaged. These are the definitions commonly used by industry participants and analysts, and are particularly suitable for our focus on risk transfer.[2]

This chapter primarily focuses on Pillar 2, as collective funds organized through the workplace. Our focus reflects the role of Pillar 2 funds as a major institutional investor class. The design of Pillar 1 programs will not be discussed, as this is primarily a fiscal issue, although it should be noted that in some advanced economies, such as Japan, France, and Canada (and certain developing economies), some public sector schemes are (at least partially) funded.[3] This chapter will only briefly discuss Pillar 3 and efforts by some governments to encourage long-term retirement savings generally, as we plan to discuss the fund management industry and household sector in more detail in the March 2005 GFSR. Indeed, the economic characteristics of DC plans, including their allocation of risk, are very similar to Pillar 3, and this chapter focuses more on the management of DB plans and the forces moving funds from DB to DC, rather than on the management of DC plans themselves.

Pillar 2 funds can enhance financial stability by acting as a stable, long-term investor base; however, increasingly a variety of factors are influencing their structure, investment behavior, and management of risks. These factors, and how we arrived at a point many call "a pensions crisis," are discussed in the chapter. Similar to our previous work, we have highlighted influencing factors, such as market characteristics, regulatory and tax policies, and accounting principles. Finally, we look at different investment strategies and risk management approaches, and how these may help pension funds take a long-term perspective, and thereby support financial stability objectives.

Why Pension Funds Are Important for Financial Stability

An Aging Workforce

The importance of pension savings has increased dramatically in recent years, particularly as populations mature. Historically, low proportions of pensioners in the overall population and the relatively larger workforce from the "baby boom" generation kept the burden of pension outlays somewhat modest. DB schemes seemed a manageable and even attractive (due to benefit deferral) proposition to many companies. But as populations age, the relative size of pension liabilities and investment risk grows. The growth in liabilities has been greater than expected, as increases in longevity have consistently exceeded earlier actuarial forecasts. Questions of managing and maintaining funding levels have become more urgent, and some pension providers will find it increasingly difficult to meet their payment obligations according to their existing benefit structures. For policymakers, the relative burdens and merits of each of the three pillars are increasingly a prominent topic of political and social debate.

Advanced economies are confronted with a variety of retirement challenges associated

[2]Another definition used in pension studies, particularly for emerging markets, was first developed in World Bank (1994). It describes Pillar 1 as "non-contributory state pension," Pillar 2 as "mandatory contributory," and Pillar 3 as "voluntary contributory." This definition has been most useful for considering questions of social safety nets, redistribution of income, and related issues.

[3]Many emerging market economies also wholly or partially fund public sector pension schemes. Emerging market pension issues will be discussed in future GFSRs.

Table 3.1. Life Expectancy at Birth: Estimates and Projections
(In years)

	1955	1980	2000	2020	2050
United States	68.9	73.3	76.2	78.7	81.6
Japan	63.9	75.5	80.5	84.3	88.1
Selected European countries[1]	67.6	73.3	77.7	80.5	83.2

Sources: United Nations, *World Population Prospects: The 2002 Revision;* and IMF staff estimates.
[1]Weighted average for France, Germany, Italy, the Netherlands, Switzerland, and the United Kingdom; weights are based on the countries' total population data for 2000.

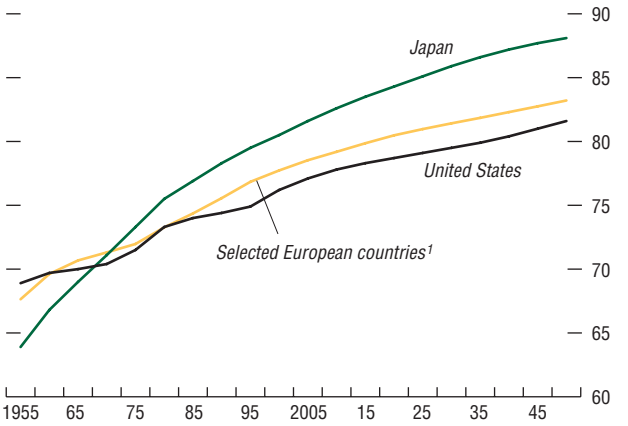
with population aging, reflecting in part two long-term trends:[4]

- *Increasing longevity.* In recent decades, life expectancy at birth has consistently increased in all advanced economies, from an average of about 68 years in the postwar period to 78 years today (Table 3.1 and Figure 3.1), and is projected to reach 80 years or more by 2020. Importantly for pension costs, life expectancy after age 65 is also rising steadily, from 18 years currently, to a projected 20 years or more in 2020 in the United States and some selected European countries, and rising steeply in Japan (Figure 3.2).
- *Low and declining fertility rates.* In advanced economies between the early 1950s and the late 1990s, fertility rates have dropped from about 2.8 to 1.7 children per woman, and are below the replacement rate in most advanced economies, except the United States.

While population aging is a global phenomenon, it is happening rapidly in some countries. The aging trend is particularly visible in Italy, Japan, and Switzerland, where the

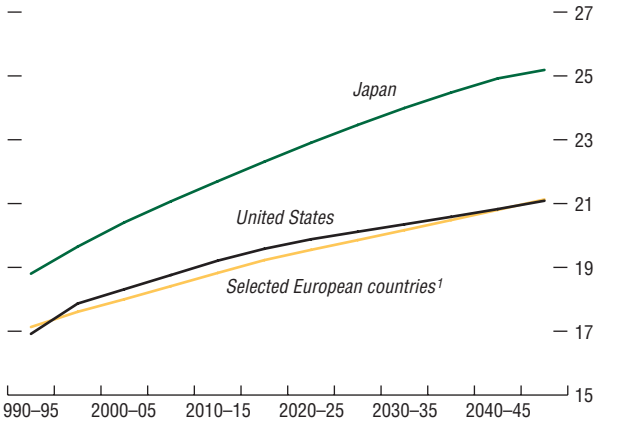
[4]We have explicitly excluded the health and medical issues from the scope of this study, in order to focus on funded pensions. However, health and medical costs are rising rapidly in all the mature markets, and to the extent that such private schemes are funded at all, the funding levels are significantly lower than pensions. (For example, for companies in the Standard & Poor's 500 at the end of 2003, the average funding levels were approximately 87 percent for pension liabilities and 15 percent for medical and health care plans.)

Figure 3.1. Life Expectancy at Birth
(In years)



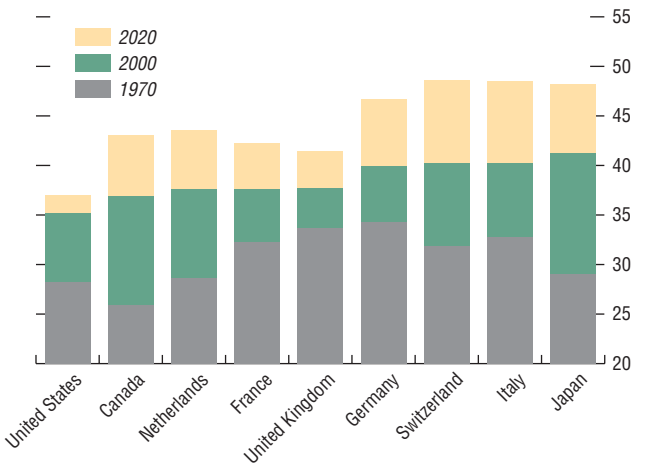
Sources: United Nations, *World Population Prospects: The 2002 Revision*; and IMF staff estimates.
[1]Weighted average for France, Germany, Italy, the Netherlands, Switzerland, and the United Kingdom; weights are based on the countries' total population data for 2000.

Figure 3.2. Remaining Life Expectancy at Age 65
(In years)



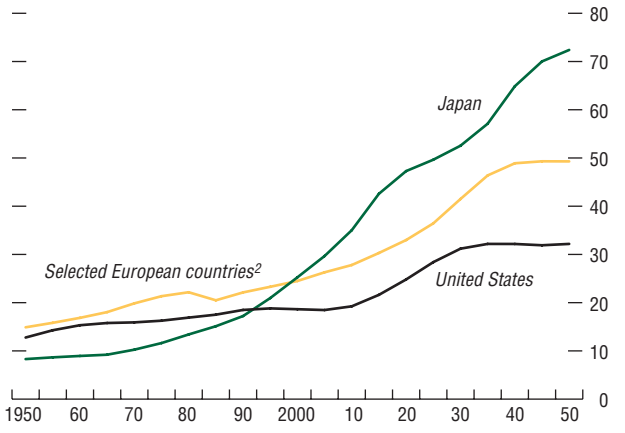
Sources: United Nations, *World Population Prospects: The 2002 Revision*; and IMF staff estimates.
[1]Weighted average life expectancy at age 65 for France, Germany, Italy, the Netherlands, Switzerland, and the United Kingdom; weights are based on the countries' total population data for 2000.

Figure 3.3. Median Age of Population, by Country[1]
(Medium fertility variant)



Source: United Nations, *World Population Prospects: The 2002 Revision.*
[1]Countries are shown in increasing order of the median age of population in 2000. The United Nations' medium fertility variant assumes that fertility levels converge to 1.85 births per woman in all countries.

Figure 3.4. Dependency Ratio for Selected Countries[1]
(In percent)



Sources: United Nations, *World Population Prospects: The 2002 Revision;* and IMF staff estimates.
[1]Population aged 65 and over as a percentage of population aged 15 to 64.
[2]Weighted average dependency ratio for France, Germany, Italy, the Netherlands, Switzerland, and the United Kingdom; weights are based on the countries' total population data for 2000.

median age is already above 40 years today, and projected to approach 50 years by 2020 (Figure 3.3). Moreover, national differences in median age are projected to widen in the coming years.

A direct implication is the continued increase in the dependency ratio—the ratio of pensioners to working age population. The dependency ratio is currently about 20 percent in Europe, Japan, and North America, and is projected to increase rapidly once the "baby boom" cohort begins to reach retirement age around 2010. By 2030, this ratio may reach 30 percent in North America, 45 percent in Europe, and 55 percent (and rising rapidly) in Japan (Figure 3.4). The demand for retirement income relative to contributions from working income will be proportionately greater, and this pressure will be felt by private companies (particularly in older or declining industries) as well as by public/state programs.

Policymakers have started to address these challenges and to rethink their pension systems. Thus far, pension reforms frequently have been aimed at reducing the generosity of existing systems in various ways: reducing benefits, increasing contributions (e.g., taxes to pay for state pensions), redefining risk sharing between sponsors and beneficiaries, and increasing the retirement age. Given the scale of the problem, it is likely that actions on several of these fronts will be needed.[5] Increased funding of pension obligations, by both the public and private stctors, and greater retirement savings by individuals (Pillar 3), are increasingly part of the solution.

Pension Funds Are Significant Investors in Global Financial Markets

Funded pension plans' size and importance to financial markets vary sharply between different countries. The countries we have studied can be broadly classified into two groups:

[5]See, for example, Turner (2003) and Moody's Investors Service (2004).

those where pension assets represent more than 60 percent of GDP, including the Netherlands, Switzerland, the United Kingdom, and the United States; and those where pension assets represent less than 20 percent of GDP, including France, Germany, Italy, and Japan (Table 3.2).[6]

In a number of countries, pension funds are the largest class of institutional investor. Pension funds represent about 50 percent or more of institutionally held assets in the Netherlands and Switzerland; over 33 percent in the United Kingdom and the United States; and about 20 percent in Japan. The proportion remains negligible in countries where private pension savings are not well developed or are chiefly managed by insurance companies, for instance in France and Germany (Table 3.3).

The investment behavior of pension funds can have a significant effect on markets, as they hold a large and growing proportion of overall financial assets. As of the end of 2001, pension funds in the United Kingdom and the United States held domestic equities equal to 18 and 22 percent, respectively, of total domestic equity market capitalization (Table 3.4). Meanwhile they held domestic bonds (both credit and government securities) equivalent to 11 and 9 percent, respectively, of total domestic bond market capitalization. In the Netherlands, pension funds' total equity allocation (both domestic and foreign) equals 36 percent of the country's domestic equity market capitalization, and Swiss pension funds' total bond allocation (domestic and foreign) equals 59 percent of the domestic bond market capitalization, leading pension funds from both countries to invest substantial proportions abroad. In contrast, pension funds' relative holdings in Germany, Italy, and Japan are much smaller.[7] But with these and other countries moving toward increased funding of pension liabilities, the global pension fund industry and its impact on financial markets can be expected to grow.

Changes in Pension Funds' Asset Allocations Could Impact Financial Markets

There is an ongoing debate on the merits of pension funds holding bonds versus equities, raising the question of whether bond and equity markets could be impacted by major portfolio reallocations. Equity allocations are currently as high as 50–70 percent in many pension funds in Japan, the Netherlands, the United Kingdom, and the United States (Figure 3.5). Fund managers, pension consultants, and market analysts increasingly believe that regulatory and accounting changes (under consideration or recently adopted) could trigger a significant reallocation of pension assets from equities into bonds, as sponsor companies seek to reduce funding risk and accounting volatility (see the section, "Asset Allocation and Risk Management," later in this chapter). An immediate or short-term reallocation from equities could have a significant impact on financial markets and asset prices in the short term. However, such a shift would seem unlikely given the reluctance of many pension fund managers to move from equities to bonds (or pursue more closely matched risk management strategies) while they remain significantly underfunded.[8] The

[6]The Japanese figures exclude assets held by the Pillar 1 Government Pension Investment Fund (GPIF). Although this public pension scheme is a pay-as-you-go system, it has accumulated a surplus from contributions worth ¥150 trillion, invested in government bonds, equities, and foreign securities.

[7]In Japan, in addition to occupational pension funds, the GPIF's equity holdings amount to 3 percent of domestic stock market capitalization.

[8]In the appendices to CIEBA (2004), a Morgan Stanley research report estimates that an abrupt reallocation could lead to a temporary 10 to 15 percent reduction in U.S. equity prices and a 75–150 basis point flattening of the U.S. government bond yield curve, while a Goldman Sachs paper estimates only a 1 percent reduction in equity prices and a 10 basis point reduction in long-term yields.

Table 3.2. Asset Allocation of Autonomous Pension Funds[1]

(In percent of total financial assets of pension funds, unless otherwise noted)

	1992	1995	1998	2001
Germany				
Cash and deposits	1.5	1.8	1.8	2.0
Bonds	49.5	54.9	55.8	57.4
Equities	0.2	0.0	0.0	0.1
Loans	48.1	43.0	42.2	40.5
Other	0.8	0.2	0.2	0.1
Memorandum items:				
Financial assets (in billions of U.S. dollars)	56.6	65.3	69.3	60.5
Financial assets (in percent of GDP)	2.9	2.7	3.1	3.3
Italy				
Cash and deposits	32.4	38.5	45.4	36.0
Bonds	42.2	33.3	36.1	40.5
Equities	0.1	2.2	0.9	6.8
Loans	0.0	0.0	0.0	0.0
Other	25.3	26.1	17.7	16.7
Memorandum items:				
Financial assets (in billions of U.S. dollars)	38.3	39.0	38.7	47.3
Financial assets (in percent of GDP)	3.1	3.5	3.1	4.4
Japan[2]				
Cash and deposits and other	2.2	1.9	2.5	2.7
Bonds	28.9	27.1	30.7	31.5
Equities	19.4	25.3	46.9	52.3
Loans	8.9	5.5	2.2	1.5
Insurance	40.3	39.9	17.7	12.1
Memorandum items:				
Financial assets (in billions of U.S. dollars)	416	634	619	611
Financial assets (in percent of GDP)	10.7	13.1	13.9	16.0
Netherlands				
Cash and deposits	1.9	2.1	1.5	1.5
Bonds	22.8	27.4	33.5	34.7
Equities	17.8	27.2	40.1	49.5
Loans	48.3	35.7	19.1	8.8
Other	9.2	7.6	5.8	5.4
Memorandum items:				
Financial assets (in billions of U.S. dollars)	244.8	352.1	444.2	397.5
Financial assets (in percent of GDP)	76.0	84.8	107.5	105.1
Switzerland[3]				
Cash and deposits	10.0	11.3	10.7	8.5
Bonds	40.5	36.9	35.5	35.9
Equities	13.1	25.5	31.9	39.0
Loans	34.8	23.4	19.3	13.8
Other	1.6	2.9	2.6	2.9
Memorandum items:				
Financial assets (in billions of U.S. dollars)	145.0	217.5	269.2	280.8
Financial assets (in percent of GDP)	59.6	80.0	97.5	113.5
United Kingdom				
Cash and deposits	3.6	4.0	4.4	3.3
Bonds	9.9	13.4	15.8	14.5
Equities	74.8	70.8	66.8	63.5
Loans	0.1	0.0	0.0	0.0
Other	11.6	11.7	13.0	18.8
Memorandum items:				
Financial assets (in billions of U.S. dollars)	552.4	759.7	1,136.5	954.0
Financial assets (in percent of GDP)	52.7	68.2	79.3	66.4

Table 3.2 *(concluded)*

	1992	1995	1998	2001
United States				
Cash and deposits	4.5	3.7	3.7	3.7
Bonds	31.1	26.9	21.1	23.1
Equities	46.5	54.3	62.5	59.8
Loans	2.8	1.8	1.6	1.8
Other	15.0	13.2	11.0	11.5
Memorandum items:				
Financial assets (in billions of U.S. dollars)	3,011.6	4,226.7	6,231.9	6,351.3
Financial assets (in percent of GDP)	50.0	57.1	71.0	63.0

Sources: OECD Institutional Investors Yearbook; Japanese Pension Fund Association; and Bank of Japan, *Flow of Funds*.
[1]Occupational and personal pension funds, legally separated from the plan/fund sponsor taking the form of either a special purpose legal entity (a pension entity) or a separate account managed by financial institutions on behalf of the plan/fund members.
[2]Asset allocation shares are those of Employee Pension Funds only. Memorandum items include all pension fund assets.
[3]For 1995 and 2001, data refer to 1996 and 2000, respectively.

impact of a more gradual reallocation is more difficult to assess, especially as broader changes in the risk management practices of pension funds can be expected in the coming years.

Pension fund demand could have a particularly pronounced impact on certain asset classes. Pension funds are increasingly focusing on asset-liability management (ALM) (i.e., ensuring that liabilities are sufficiently covered by suitable assets) and in particular the relative duration of assets and liabilities. Many market participants highlight the relatively short supply for this purpose of long-term bonds (i.e., 20 to 30 years or longer), and particularly inflation-indexed bonds (see Table 3.5). At present, even a relatively modest reallocation of pension assets into these long-term securities would overwhelm the market, as liquidity constraints could lead to significant short-term price volatility. Over time, however, the supply of long-term and inflation-indexed bonds may increase, possibly with government leadership, and we would expect pension funds to be a significant investor.

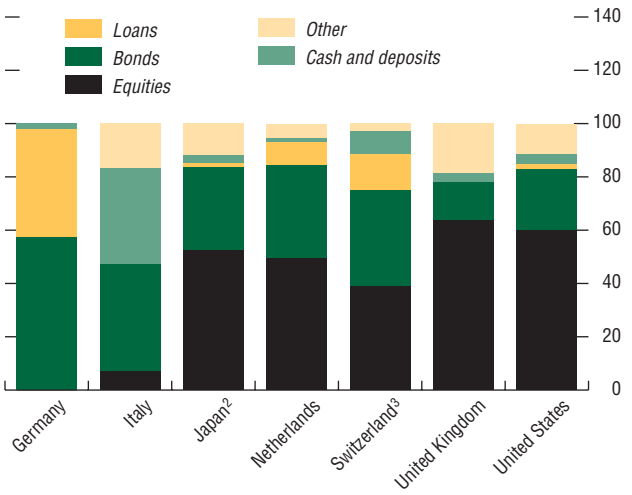
The potential for greater international diversification by pension funds could also have a strong impact on international capital flows. In particular, as populations age in the mature markets and their need for retirement savings grows, this creates potential demand to make additional investments in countries

Table 3.3. Financial Assets of Institutional Investors, 2001[1]
(In percent of total financial assets, unless noted otherwise)

	Total Financial Assets[2]	Investment Companies[3]	Pension Funds	Insurance Companies	Other
France	131.8	47.7	. . .	52.3	0.0
Germany	81.0	44.9	4.1	51	0.0
Italy	94.0	35.6	4.7	23.7	35.9
Japan	94.7	10.0	19.5	63.7	6.8
Netherlands[4]	190.9	11.9	55.0	32.3	0.8
Switzerland[5]	232.7	13.8	48.8	37.4	0.0
United Kingdom	190.9	14.4	34.8	50.8	0.0
United States	191.0	34.3	33.0	21.2	11.5

Source: OECD Institutional Investors Yearbook.
[1]Institutional investors are insurance companies, investment companies, and pension funds.
[2]In percent of GDP.
[3]Open-end and closed-end investment companies.
[4]For 2001, excluding nonlife insurance.
[5]For 2001, including total assets of pension funds.

Figure 3.5. Asset Allocation of Autonomous Pension Funds, 2001[1]
(In percent of financial assets of pension funds)



Sources: OECD Institutional Investors Yearbook; Japanese Pension Fund Association; and Bank of Japan, *Flow of Funds*.
[1]Occupational and personal pension funds, legally separated from the plan/fund sponsor taking the form of either a special purpose legal entity (a pension entity) or a separate account managed by financial institutions on behalf of the plan/fund members.
[2]For Japan, "other" refers to insurance sector; and "cash and deposits" refer to cash, deposits, and other. Allocations are those of Employee Pension Funds (EPFs) only.
[3]For Switzerland, data refer to 2000.

Table 3.4. Pension Fund Holdings Compared with the Size of Domestic Market, 2001
(In percent)

	Equities[1]		Bonds[2]	
	Domestic	International	Domestic	International
Japan	7.4	. . .	3.2	. . .
Netherlands	6.5	29.4	15.2	23.3
Switzerland[3]	6.9	5.8	38.1	21.1
United Kingdom	18.1	9.8	11.2	3.4
United States	22.4	5.1	8.7	0.2

Sources: OECD Institutional Investors Yearbook; BIS; Bank of Japan, *Flow of Funds*; World Federation of Exchanges; Datastream; UBS Global Asset Management; and IMF staff estimates.
[1]Holdings of equities as a percentage of total domestic market capitalization.
[2]Holdings of securities over one year in maturity as a percentage of total public and private domestic debt securities outstanding.
[3]Data refer to 2000.

with younger labor forces (in particular, emerging markets), and raises questions about the ability of those markets to absorb substantially greater flows.

The Funding Challenge

The debate over the design and asset allocation of pension funds has taken on more urgency as the industry has swung from overfunded to underfunded status in recent years. These factors have focused attention on the investment and other risks associated with traditional DB plans. This has led to a closer consideration of the merits of different asset classes in matching pension liabilities and accelerated the industry's consideration of DC and hybrid pension plan alternatives to traditional DB schemes.

How Pension Funds Became Underfunded

Several factors have led pension funds to become underfunded in recent years.[9] This section focuses on the rising level of DB plan promises, especially relative to contributions, and on the impact of falling equity markets and interest rates.

[9]See, for instance, IMF (2003).

Table 3.5. Selected Countries: Total Outstanding Long-Term Bonds
(In billions of U.S. dollars)

	United States		United Kingdom		France		Italy		Japan	
	2000	2003	2000	2003	2000	2003	2000	2003	2000	2003
Corporate and government long-term bonds[1]	1,143	1,257	144	202	74	128	81	223	250	368
Inflation-indexed government bonds[2]	115	166	99	139	12	59	1	11	. . .	. . .
Memorandum item:										
Total pension fund assets (at end-2001)	6,351		954		. . .		47		711	

Sources: U.S. Department of the Treasury; U.K. Debt Management Office; Agence France Trésor; Italy, Ministry of Economics and Finance; Japan, Ministry of Finance; Merrill Lynch; and OECD, *Institutional Investors Yearbook 2003*.
[1]Total amount of 10-year and above maturities. For the United Kingdom, France, and Italy, government bonds only.
[2]For France and Italy, also includes bonds indexed on euro area inflation.

Pension funds in North America and parts of Europe historically have held significant amounts of equities in their portfolios. This reflected a belief in the greater long-run returns expected from equities compared with bonds. In the United States, this also partly reflected the interpretation of the "prudent person" rule introduced as part of the Employee Retirement Income Security Act (ERISA) in 1974, which in part requires "diversifying investments . . . so as to minimize the risk of large losses, unless under the circumstances it is clearly not prudent to do so," which led many pension funds to more systematically diversify across asset classes.[10]

During the 1990s, as equity prices rose, the funding ratio of many DB plans rose well above 100 percent. While accounting and actuarial smoothing of market valuations reduced the immediate impact of equity prices on funding ratios, the steady rise in equity prices fed through over time (Figures 3.6 and 3.7). In some cases, the "overfunding" was further exaggerated by the use of above-market or relatively fixed discount rates for funding ratio calculations, even as market rates for bonds fell throughout most of the 1990s.[11]

Moreover, projections of future returns, based largely on recent performance, further boosted calculated funding ratios by extrapolating forward these current strong equity market returns.

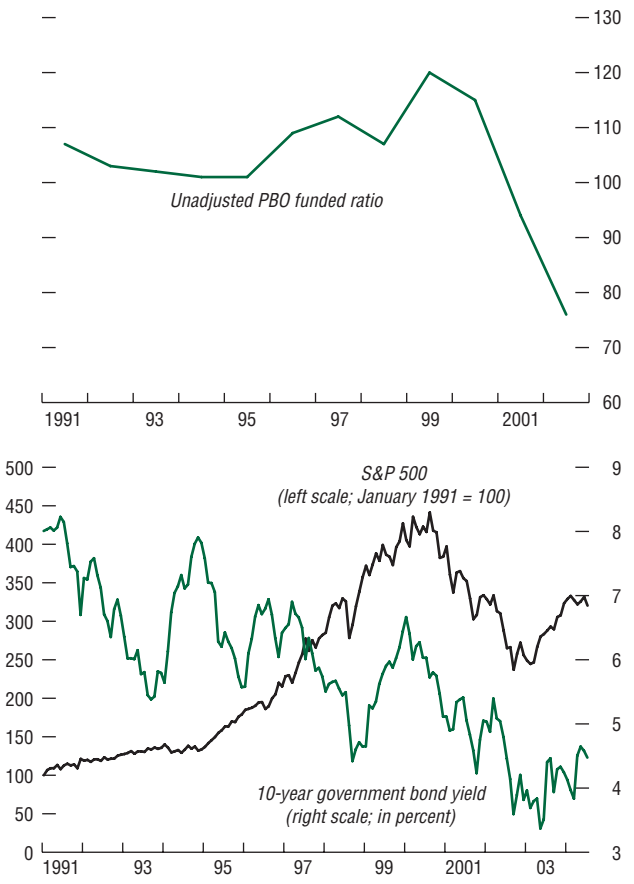
Sponsor companies often acted to "realize" these gains, thereby weakening the capacity of pension funds to absorb future shocks. In particular:

- Many sponsor companies reacted to their pension fund's overfunding (both real and exaggerated) by reducing or eliminating contributions. Sponsor companies were able to reduce their annual contributions (or, in some cases, tax regulation penalized further contributions) and in many cases take "contribution holidays" of a decade or more. In other cases (such as in Switzerland or in the U.S. public sector), contributions by employees were reduced as well.
- Companies with surplus pension funding also frequently increased the size and scope of benefits, including through indexation. The costs of these benefit increases did not directly affect companies' reported profits. But in practice they introduced permanent increases in liabilities and greater risk to the

[10]Asset allocations became more similar in the U.S. pension fund industry after the adoption of ERISA, as the "prudent person" rule contributed significantly to a convergence in asset allocation between different pension funds. In 1970, the equity allocation of state and local government pension funds was 23 percent, whereas that of private trusteed pension funds was 54 percent. By 2000, the allocations were much more similar, at 58 percent and 48 percent, respectively.

[11]In Japan, the Netherlands, and Switzerland, fixed discount rates for liabilities were used, while U.K. discount rates allowed a large element of actuarial discretion and were typically set well above market rates (although a market-related element was increasingly used from the mid-1990s onwards).

Figure 3.6. United States: Ratio of Assets to Projected Benefit Obligations (PBOs) for the Fortune 500
(In percent)



Sources: Hewitt Associates; and Bloomberg L.P.

financial strength of pension funds, with the costs and risks further magnified by increases in longevity beyond earlier actuarial projections. In some cases, generous early retirement packages were used to increase turnover in the workforce and to phase out DB plans and introduce new DC-style plans for younger employees.

Japan also experienced overfunding, but with a different timing. Overfunding developed in the late 1980s during the asset market bubble. However, poor returns in the 1990s on both equity and fixed-income markets, together with returns of 5.5 percent required on Pillar 1 pension contributions managed by employers, led to 66 percent of private pension funds becoming underfunded by 1996.[12] Overfunding briefly occurred again following the abolition of investment limits in 1996, which allowed an increase in equity holdings. (Under previous limits, pension funds were required to invest more than 50 percent of their assets in bonds, and less than 30 percent each in equity and foreign securities.) Japanese pension funds raised their allocation in equities to above 50 percent by 2000, and at that time 82 percent of Japanese funds were overfunded (Figure 3.8).[13]

Between 2000 and 2002, pension funds worldwide became significantly underfunded. The equity market fall of 2000–02 sharply cut the funding ratios of pension funds that, in many cases, held equity allocations of 50 percent or more (see Table 3.2). Moreover, market interest rates, which increasingly were being used in some jurisdictions (such as Japan and the United Kingdom) as the basis

[12]In Japan, employers providing Pillar 2 pensions in the form of Employee Pension Funds (EPFs) are also required to administer (as agents) the government's Employee Pension Insurance (EPI) for their employees, withholding contributions from employees' salaries and managing the funds to provide a fixed return. In return, the EPFs are allowed to be overfunded, with the profit or loss from investing EPI returns absorbed into the overall EPF funding position.

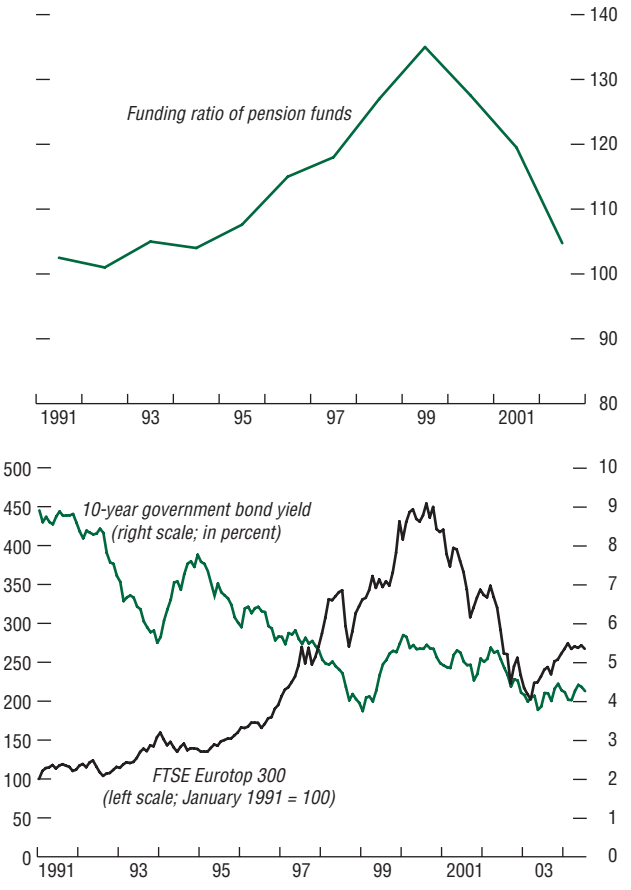
[13]See Watson Wyatt (2003).

for discounting liabilities, fell significantly, thereby increasing the present value of liabilities and creating the "perfect storm" for pension funds.[14] In the United Kingdom, the shift from contribution holidays to large annual contributions was made all the more extreme by the fact that Minimum Funding Requirement (MFR) thresholds began to dictate funding policy at many firms. (The MFR funding calculation uses more market-related discount rates—i.e., at that time, lower rates—and hence larger valuations of liabilities, than previously controlling actuarial funding calculations.) Even the assets held in the form of fixed-rate bonds failed to grow in value as fast as liabilities, largely because the average duration of such assets was typically much shorter than the duration of liabilities. By the end of 2002, over 90 percent of pension funds in Japan, the United Kingdom, and the United States were underfunded, and the rise in interest rates and equity prices since has led to only a partial recovery (Figure 3.9).

The impact of falling equity markets and bond yields on asset and liability valuations was significant. Figure 3.10 shows one estimate of the effect of valuation changes on pension funds in different countries and regions. It illustrates the impact of market changes on a hypothetical pension funding ratio, assuming that the fund started with a funding ratio of 100 percent at the beginning of 2000, and that it had a typical asset allocation and liability structure for that country or region.

Although the fall in equity values has been most often credited as causing the underfunded position of many pension funds, the fall in bond yields (and the greater use of market-related discount rates for liabilities) has been at least as important. Given the typically long duration of pension fund liabilities, changes in yields (and thus discount rates) have a major impact on the calculated value of liabilities. In the United States, for

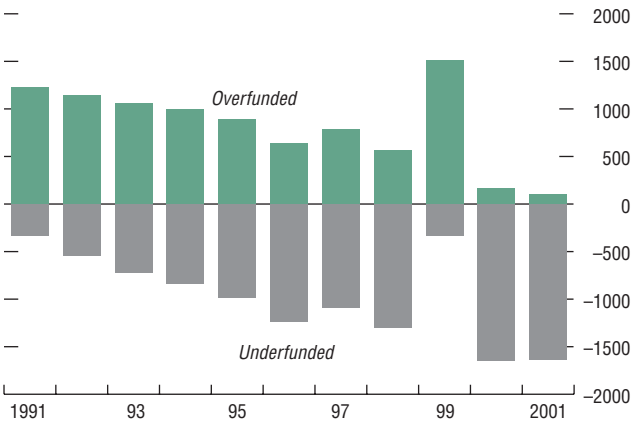
Figure 3.7. Netherlands: Funding Ratio of Pension Funds
(In percent)



Sources: Netherlands Pension and Insurance Supervisory Authority; Van Ewijk, and van de Ven (2003); and Bloomberg L.P.

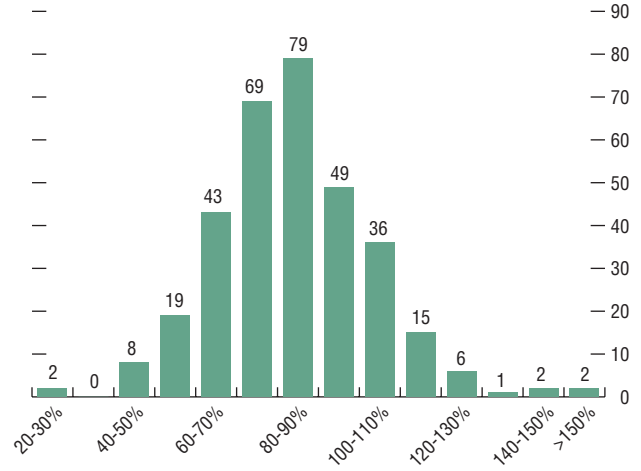
[14]See Hewitt Investment Group (2001) and Custis (2001).

Figure 3.8. Japan: Employee Pension Funds[1]
(Number of funds)



Source: Pension Fund Association.
[1]Fiscal years; before 1996, data shown on book value basis; for 1996 and after, data shown on fair market basis.

Figure 3.9. United States: Distribution of Corporate Defined Benefit Pension Plans by Funding Ratio, 2003[1]
(Number of pension plans)



Source: Wilshire, *2004 Corporate Funding Survey on Pensions.*
[1]Survey of 331 companies in S&P 500 Index.

instance, it has been said as a rule of thumb that each 10 basis point change in the discount rate leads to a 1 percent change in projected benefit obligations (PBOs) (Standard & Poor's, 2004a). Meanwhile, a recent actuarial estimate suggested that the aggregate underfunding of the 200 largest U.K. DB schemes would be eliminated by either a 30 percent rise in equity prices or a 1 percentage point rise in bond yields (Aon Consulting, 2004). This demonstrates the significant, and often underappreciated, influence market-related discount rates can have on funding ratios.

Companies have only limited scope in the short term to address their underfunding by reducing benefits or increasing contributions. Companies have had little room to reduce recently increased benefits—in fact, they were sometimes legally constrained from scaling back benefits (for instance, in the United Kingdom indexation up to a cap of 5 percent became a regulatory requirement in 1997). Weaker corporate profitability in 2001–02, and the ongoing decline in the financial strength of older industries, also restricted the ability of some sponsor companies to raise contributions.

The deterioration in funding levels, and the questions raised in some cases about the corporate sponsor's ability to meet future obligations, brought urgency to the debate about pension fund structures and strategies. The viability of DB schemes has been questioned, as well as the appropriate risk sharing between employer and employee (Pillars 2 and 3), public and private sector responsibilities, and related social and tax policy issues. The rapid deterioration of funding ratios accelerated the shift to DC schemes, and led to the development of new approaches to pension and retirement programs.

The Move from DB to DC and Hybrid Plans

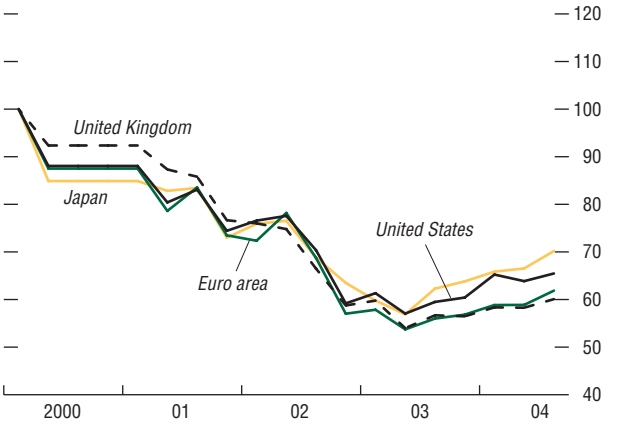
Even before the deterioration in market conditions and funding levels, there was a

growing belief that many DB schemes, as traditionally constructed, may need to be redesigned. DB schemes had become less flexible, in large part through greater benefits and increasing longevity. In addition, the DB structure may be less suitable as employees become more mobile—in fact, newer industries (often less unionized) and their generally younger workforces favor DC pension schemes, as more mobile employees are attracted by the portability of pension benefits. The move to more market-based accounting principles has also increased the perceived volatility of DB plan balance sheets.

In the United States, the use of DC plans has been growing for 30 years. The introduction of ERISA in 1974, the creation of the Pension Benefit Guaranty Corporation (PBGC), which imposed insurance premiums on DB funds, the strengthening of funding requirements, and, for some firms, a desire to reduce contribution levels supported the growth of DC plans (Figure 3.11). Over time, many DB plans have closed to new employees and/or frozen benefits at existing accrued levels, and shifted all employees to new plans. By 1985, over 35 percent of assets under management (AUM) by U.S. private pension funds were in DC plans. Since then, DC plans (e.g., 401(k) plans) have continued to increase in popularity in the United States, reaching close to 55 percent of AUM by 2000, and growing further since then.

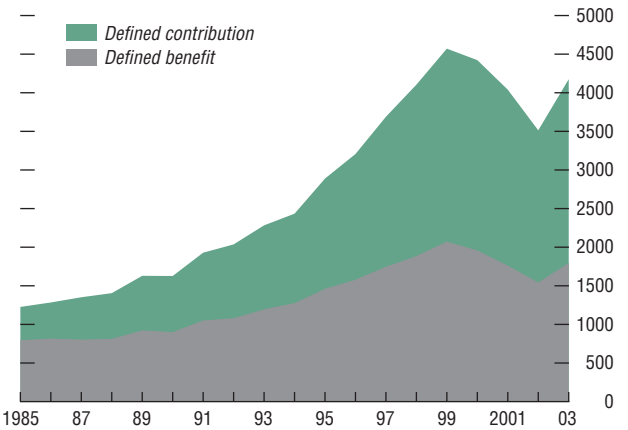
In the United Kingdom, the trend was initially slower, but the recent introduction of FRS 17 and a fair value accounting framework (to be fully implemented by January 2005) has accelerated the move away from DB schemes. In 2000, 80 percent of active participants in private sector pension funds still belonged to DB plans, but more recent information suggests that 60 percent of DB schemes (weighted by the number of employees) are now closed to new members (Jackson, Perraudin, and Trivedi, forthcoming). Many U.K. firms are also taking the

Figure 3.10. Estimated Valuation Effects on Projected Benefit Obligation (PBO) Funded Ratios[1]
(In percent)



Source: Towers Perrin.
[1]The series show the effect of asset and liability valuation changes on a hypothetical pension fund in each country or region with a typical asset allocation and liability structure, and with a funding ratio of 100 percent at the beginning of 2000, without allowing for contributions to the fund during the period.

Figure 3.11. United States: Assets Under Management of Private Pension Schemes
(In billions of U.S. dollars)



Source: Board of Governors of the Federal Reserve System, *Flow of Funds.*

opportunity to cut contribution levels as they move to DC.

In Japan, DC schemes have not grown very quickly, despite reforms in 2001 to allow DC plans to complement or replace traditional DB pension funds. Tax Qualified Pension Plans, as they exist today, will be progressively phased out by 2012, and replaced by new externally managed DB and/or DC schemes.[15] Companies with EPFs (see footnote 12) are given an option whether to transform themselves into the new DB or DC schemes. The increasing mobility of employees, and the introduction of a more transparent accounting framework in 2000, which revealed funding gaps on sponsor companies' balance sheets, prompted these reforms. The recent scaling back of Pillar 1 (cutting the benefit level by, on average, 10 percent of final salary) has also encouraged the development of DC plans.[16] However, the growth of DC plans also has been impaired by the limitation of tax deductions for employers (¥432,000 per year, per employee), and the fact that employees are not allowed to contribute to the new corporate DC schemes.

To date, the move from DB to DC schemes has not altered asset allocations a great deal. In the United States, individuals participating in DC plans have tended to allocate the majority of their funds to equity investments, which is not substantially different from DB plans (60 percent of AUM in DC plans have been invested in equity on average since 1990, compared with 53 percent for DB plans). But the shift to DC is important to financial markets, including, among other reasons, because of its transfer of risk from sponsor companies to households. It remains to be seen whether the current asset allocation pattern will continue, particularly as aging populations approach retirement age.

Despite these statistics, many consultants argue that households often remain too risk averse. Financial consultants advise individuals to hold relatively large allocations of higher risk instruments, such as equities, in pension savings when they are young, and to gradually switch to assets with more stable values, such as bonds, as they approach retirement. Consultants in a number of countries repeatedly stated that, while it may be tax efficient to hold bonds within pension savings, households generally hold too little investment risk overall. This is especially so for younger savers, particularly when looked at in the context of their overall savings (including other non-pension savings). However, in recent years a variety of "life cycle" savings products have been developed, which address asset allocation and adjustment issues related to aging.[17] (A broader discussion of household sector savings will be discussed in the March 2005 GFSR.)

The reconsideration of DB plans has also led to the development of "hybrid" pension plans (see Box 3.1). Many sponsor companies have sought to share market and longevity risk, and to adjust benefits depending on business conditions, while still guaranteeing a minimum benefit to employees. Such hybrid plans incorporate elements of both DB (as the sponsor makes contributions and bears at least some investment or guaranteed return risk) and DC plans (as benefits are often expressed in terms of an account balance and often result in a lump sum payment at retirement).

[15]Tax Qualified Pension Plans are the second largest form of pension plan in Japan, after EPFs, and are so called because they meet Corporate Tax Law conditions for tax exemptions on contributions.

[16]See IMF (2004b).

[17]In the United States, "life cycle mutual funds" were first developed in the 1990s. In order to match the presumed and recommended changing risk tolerance of individuals during their life, such funds provide greater risk taking in the early years, before automatically and gradually adjusting the asset allocation to a more conservative approach (e.g., reducing equity and increasing fixed-income investments) as the individual approaches retirement.

Table 3.6. Sources of Retirement or Replacement Income
(In percent of total income)

	Germany	France	Italy	Netherlands	Switzerland	United Kingdom	United States	Japan
Public sources[1]	85	79	74	50	42	61	41	34
Private/all other sources[2]	15	21	26	50	58	39	59	66
Memorandum item:								
Overall replacement rate (percent)[3]	82	79	80	78	81	69	67	75

Sources: Adapted from Börsch-Supan (2004); Employee Benefit Research Institute; Pensions Policy Institute; Japanese Ministry of Public Management, Home Affairs, Posts and Telecommunications, Survey of Household Economy; and IMF staff estimates.

[1]Pillar 1 includes France's AGIRC/ARRCO, the U.K.'s State Second Pension Scheme (S2P), and Japan's EPI.

[2]All private sources of retirement income, including occupational pension income as well as income from financial assets (including income from the reinvestment of lump sums paid by Pillar 2 schemes), use of bank deposits (particularly important in Japan), and earnings from work (in the United States, earnings from work are estimated to represent close to 20 percent of retirement income).

[3]Pension income, just after retirement, as a percentage of total income just before retirement, for an average two-person household; excludes sources of income other than pensions.

The use of hybrid schemes is growing in the United States, Europe, and Japan. In the United States in 2000, 21 percent of PBGC-covered plan members belonged to hybrid plans. We anticipate further growth of such plans, but legal uncertainties and technical difficulties linked to conversion from traditional DB schemes in some cases may slow their development in the near term. Many European companies are also developing hybrid Pillar 2 schemes, which give employers some flexibility over the provision of inflation protection and longevity risks (see below). In Japan, due to the greater inflexibility in DC plans (as legislated), many companies have adopted "cash balance" plans as part of their amendment of DB schemes following the 2001 reforms.

Dutch regulatory proposals have also moved their system closer to a hybrid model, and the United Kingdom has reduced the degree of required indexation. The planned regulatory reforms (including the development of a risk-based capital system, described below) encourage the traditionally indexed DB Dutch pension system to make pension indexation explicitly conditional on market conditions. Meanwhile, the United Kingdom has decided to halve the cap on required inflation indexation to 2½ percent.

New National Approaches to Pension Schemes

European countries that have been developing Pillar 2 and 3 systems in recent years benefited from the experience of countries with more established funded pension schemes. They have been conscious of the financial constraints arising from an aging population, and new designs have generally followed a DC or hybrid plan approach.

Currently, the relative importance and contribution of Pillars 1, 2, and 3 differ significantly from country to country (see Table 3.6). In countries such as the Netherlands, Switzerland, the United Kingdom, and the United States, the public pension system operates in part as a safety net, designed to provide a basic pension income, while Pillars 2 and 3 provide a much more significant contribution to retirement or replacement income than in other countries.[18] In contrast, in most continental European countries the state has traditionally been the main source of retirement benefits (generally pay-as-you-go, or PAYG), and Pillars 2 and 3 are typically

[18]See, for example, Queisser and Vittas (2000).

Box 3.1. Hybrid Pension Plans

Hybrid pension plans, in essence, have some features of defined benefit (DB) plans, but often with a greater sharing of risks by beneficiaries. Similar to traditional DB plans, the employer/trustee invests the plan assets and typically bears some of the investment risk. However, hybrid plans also operate in many ways like defined contribution (DC) plans, in that the employee typically has an individual account and can receive the account balance either in annuity form or as a lump sum at separation, thereby assuming more longevity risk. The portability and relatively earlier accrual of benefits typically provided by hybrid plans are often very attractive to today's more mobile workforce. At the same time, hybrid plans provide to employees some of the advantages of DB plans in terms of guarantees and assurance. Indeed, the terminology is not always well-defined and some "hybrid" schemes in effect provide defined benefits.

Hybrid plans take a variety of forms across countries, for example:

- In Japan, the United Kingdom, and the United States, "cash balance plans" (CBPs) are the most common form of hybrid pension plan. CBPs in those countries are plans in which a fraction of an employee's salary is deposited in a notional account (or "cash balance"). Notional accounts are used for record-keeping purposes only, as the funds are not invested for each individual separately, but for the plan as a whole. The benefits are usually based on an average rather than final salary, and may or may not contain a variable element related to market returns (in Japan they reflect asset returns with minimum guarantees), and accrue more evenly over an employee's career than under traditional DB schemes. In the United States, CBPs are legally classified as DB plans, and as such are insured by the PBGC.
- In Germany, the growth of hybrid plans reflects (in part) the impact of regulations on capital guarantees imposed on pension funds. New vehicles introduced under the Riester reform, including the Pensionsfonds, are required to guarantee a minimum benefit equivalent to principal protection. Similarly, since 2002, other vehicles, including the Pensionskasse and Direktversicherung, also need to provide such guarantees in order to benefit from state subsidies and tax deductions.

underdeveloped. In Germany, for instance, while many employers have for years provided Pillar 2 (traditionally DB) schemes, the benefit represents a modest share of aggregate pension income.[19] In France, the earnings-related mandatory AGIRC/ARRCO system,[20] even if managed and funded by contributions from both employees and employers, is in essence an additional layer of Pillar 1 (sometimes referred as "Pillar 1A"). In Italy, the *Trattamento di Fine Rapporto* system, under which employers pay a lump sum when an employee leaves the company, has long been the closest proxy to a Pillar 2 scheme, but has represented only a small part of retirement income. While the framework for new DC schemes was established in 1993 in Italy, DC plans have gained momentum only since

[19]Pillar 2 pension benefits are estimated to represent approximately 5 percent of retirees' overall income. At end-March 2003, 43 percent of private sector employees (46 percent in western Germany and 27 percent in eastern Germany) were members of occupational pension schemes. Pension fund membership has been greater in the manufacturing sector than the service sector, and much greater in large companies than small and medium-sized corporations. Indeed, pension fund membership tends to be relatively greater in large companies than smaller companies in many advanced economies.

[20]*Association Générale des Institutions de Retraites des Cadres* (AGIRC) and *Association des Régimes de Retraites Complémentaires* (ARRCO).

1999, and by 2003 15 percent of the eligible population had enrolled in DC plans.

In many countries, the newer designs generally are intended to develop multi-pillar funded schemes, to supplement Pillar 1 as the traditional primary source of retirement income. These reforms include major changes (often reductions) in Pillar 1 programs, expanded funded corporate schemes (generally DC or hybrid), and the development of individual retirement savings vehicles.[21]

Germany, for example, is moving toward funded hybrid pension schemes.[22] The existing Pillar 2 schemes are primarily DB plans. Among them, *Direktzusage* (or "book reserve"—historically the most popular DB scheme with large German corporates) has not been funded by segregated assets, but the pension fund liabilities are included directly in the company balance sheet, backed by the operating assets of the sponsor company and considered "internally funded." The range of occupational pension schemes has been expanded in 2001 with the creation of *Pensionsfonds*, which can be set up as either DB or DC schemes. Furthermore, "hybrid" schemes (in Pillar 2 and in Pillar 3) are growing in Germany, many of which provide principal protection and minimum guaranteed returns on accrued contributions in order to qualify for favorable tax treatment. Employees typically are required to take an annuity on retirement.

Italy and France, through *Fondi Pensione* and *Plan d'Epargne Retraite Collectifs (PERCO)*, have established pure DC schemes for all private sector employees (and public sector employees in Italy).[23] In both countries, these DC schemes are required to offer participants a menu of investment options with different risk-return profiles. As in Germany, the tax regime in Italy encourages the payment of benefits at retirement through annuities, rather than as a lump sum.

Key Influences on Pension Funds' Financial Management

In addition to the challenge of aging populations, a number of other factors influence the management of pension funds. National financial market characteristics, regulations and tax policy, pension guarantee schemes, and accounting standards have a significant effect on asset allocation and risk management strategies.

Financial Market Characteristics

As discussed in the April 2004 GFSR study on the life insurance industry, national market characteristics play a significant role in influencing institutional investment styles and preferences. Pension funds, like other institutional investors, show a high degree of home bias in their investment strategies. As such, national markets may supply or limit the investment alternatives desired by pension funds to meet their specific investment needs.

However, pension fund investment behavior can be quite different from other institutional investors in the same country or region, suggesting that regulatory and other factors are also influential. In markets with relatively developed funded DB plans, equities form a large part of pension funds' aggregate investments. In some countries, this contrasts sharply with the life insurance industry. For example, in the United States, pension funds are much more heavily invested in equities than insurers, despite the large domestic availability of corporate bonds and other credit

[21]See, for example, Allianz Dresdner Asset Management (2003).

[22]Changes in German pension schemes are taking place in the context of the "Riester Reform" (2000–02).

[23]Loi Fillon (2003) in France and the Berlusconi measures of 2003–04 in Italy. The recent Italian measures followed the 1992–93 d'Amato reforms and the Dini-Prodi reforms of 1995–97 that introduced one of the most radical pension reforms across industrial countries, switching from a PAYG DB scheme to a DC system.

instruments. Similarly, in European countries pension funds have not followed insurers, which have increased corporate credit investments following recent pressure on solvency margins and improvements in risk management techniques. This suggests that the lack of risk-based incentives, implemented perhaps through funding requirements or pension insurance premiums, or the relative sophistication and adoption of risk management techniques may be at least as important a determinant of investment strategies as the characteristics of local or regional capital markets.

An important issue for pension funds is the availability of long-term and index-linked bonds. As routinely stressed by pension fund managers, financial products such as annuities and long-dated and index-linked debt instruments may better match pension liabilities with an average duration often beyond 20 years, as well as addressing the needs of individuals for Pillar 3 savings products. The market for long-term bonds is deepest in the United States (although, even there, the size of the market for maturities beyond 10 years is relatively modest). A number of countries—for instance, France, the United Kingdom, and the United States—have small but growing markets for index-linked bonds (see Table 3.5). The United States has recently widened its maturity range of issues to include a 20-year Treasury Inflation Protected Security (TIPS) bond, and Germany and Switzerland have also announced their intentions to issue their first inflation-linked bonds in 2005. But in all mature markets such long-term instruments remain small compared with the size of pension fund portfolios.

As a result, pension funds have sought other ways to increase or match duration, and some have turned to equities for long-term hedges. Given supply constraints on long-term or index-linked bonds, some pension funds have relied on equities or other instruments to provide more duration or inflation hedges. This explains the relative significance of equity holdings or real estate in many pension fund portfolios. In addition, derivative instruments (such as swaps) have attracted some pension fund managers seeking to increase asset duration or obtain some form of inflation protection.

Certain policy actions may be needed to stimulate further issuance of long-term and index-linked bonds and to support these markets. The availability and development of such instruments should be supported by national governments, including through government issuance and clear and consistent tax policy regarding long-term bonds. This should enhance pension funds' ability to act as long-term providers of capital and support financial stability. Corporate issuers desiring long-dated funding exist in most mature markets, such as capital-intensive industries, utilities, financial services (banks and insurers), and housing. In some areas (e.g., Europe), the development of securitization and structured credit markets may also provide such instruments. Insurance companies will undoubtedly have an important role to play in the expansion of annuity markets; however, even here, insurers need long-term market instruments to efficiently hedge and price annuity risk.[24] One particular factor that may inhibit the supply of annuities by insurers may be the difficulty of managing longevity risk of the extreme elderly as average life expectancy continues to rise (often by more than earlier projections). Backstop government funding of this "tail risk" could be an option to consider

[24]Annuities may provide payments either for the lifetime of the beneficiary or for a fixed term. In the United Kingdom, DC pension funds are required to provide 75 percent of pensions via lifetime annuities, and increasingly fewer insurers are willing to sell such products. In the United States, by contrast, most annuities are fixed-term, thus presenting fewer hedging challenges. For a broader discussion of the challenges in developing such markets, see Jackson, Perraudin, and Trivedi (forthcoming).

Box 3.2. Individuals' Life-Cycle Savings and Global Capital Markets

Aging is expected to have far-reaching implications for the global distribution of growth, labor, and capital. While aging is a global trend, there are large differences in its speed across countries and regions. These differences, combined with the reforms of numerous national pension systems, may have a significant impact on the overall supply of capital, the performance of capital markets, and international capital flows.

Life Cycle and Supply of Capital

According to the traditional life-cycle theory of consumption and savings, national savings rates are expected to decrease in an aging economy. To make up for lower income during retirement, individuals would save an increasing fraction of their income during their working life and dissave during retirement. This would result in a hump-shaped savings profile over a person's life (see the Figure).

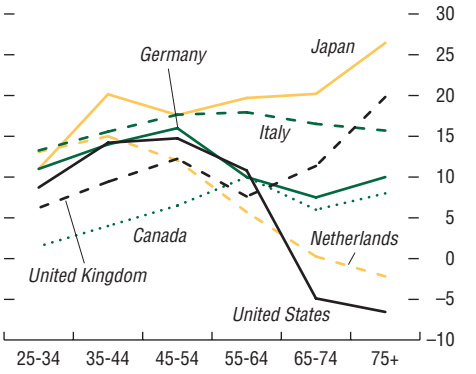
Recent reforms toward multi-pillar pension systems are likely to validate this theory. For instance, in European countries with predominantly public PAYG systems (e.g., France, Germany, and Italy), no old age dissavings has been observed (indeed, intergenerational transfer of savings to younger relatives is taking place), whereas in the Netherlands and the United States, where a large share of retirement income is provided through private pension schemes, the hump-shaped life-cycle savings profile is evident. This suggests that reforms toward more balanced multi-pillar pension systems may induce both increased savings for retirement among European workers and a decline in savings rates at or near retirement.

The Potential Benefits of International Diversification

Investing pension assets internationally may be good not only for risk diversification but also to realize better returns. With the growth of funded pension plans and the removal in some cases of investment restrictions, increased attention has been paid to the international investment of retirement savings. Overlapping generations models applied to advanced economies show that substantially higher aggregate savings rates can be expected in an open economy than in a closed economy. In a closed industrialized economy, an increase in national savings leads to a larger capital stock and to a decrease in the rate of return on capital, which acts to crowd out additional savings. In an open industrialized economy, more savings are generated as the rate of return does not change significantly. Indeed, research indicates that not only a country or region's absolute age structure (and thus capital supply) but relative differences in age structure across countries or regions are an important determinant of capital flows.[1]

However, the degree to which relative aging may determine capital flows will also depend on the international mobility of capital. In this regard, existing frictions, such as taxation or foreign investment limitations, together with investors "home bias," may limit the benefits of international diversification.

Estimated Personal Savings Rates for Selected Countries by Age[1]
(In percent)



Sources: Schieber (2003); and Börsch-Supan (2004).
[1]Ages are of the household head/reference person; and savings rate in each age group is for all households in their respective samples.

[1]See for example Higgins (1998), Reisen (2000), and Lührmann (2002).

if it avoids a greater Pillar 1 cost arising from a shortage of supply of annuities.

International diversification can help overcome national or regional market constraints and support macroeconomic savings patterns. National savings rates are likely to decline in aging societies, due to life-cycle effects. This may encourage greater investment of pension assets into the economies of younger, economically faster-growing countries or markets. Indeed, there is evidence that such international diversification not only provides benefits from risk diversification, but may also provide higher returns on capital (Box 3.2). This highlights the importance of pursuing regulatory efforts to eliminate domestic investment restrictions and promote improvements in risk management at pension funds.[25]

Taxation and Regulation

Regulatory and tax constraints on investment behavior and national funding rules significantly influence pension fund strategies. Among the rules set by a variety of bodies, tax rules tend to have the greatest influence on annual funding decisions by pension sponsors and on individuals with regard to retirement savings.

Taxation

In many cases, tax rules on pension contributions effectively set upper and lower bounds for funding decisions. This is the case in the United States, where contributions that would increase the funding level beyond a 100 percent funding ratio are not tax deductible, and even attract an additional 10 percent excise tax. At the same time, tax policies and penalties also aim to prevent large funding deficiencies, such as through the imposition of a tax of 100 percent of the deficiency in case of failure to correct it.

Taxation and other rules can create disincentives or prohibitions to annual contributions or the withdrawal of surplus assets, thereby further discouraging precautionary overfunding. In the United States, excess assets cannot be withdrawn by companies from pension schemes unless the scheme is terminated, and then up to a 50 percent duty plus standard corporation tax would need to be paid. Meanwhile, as noted above, the loss of annual deductibility and a 10 percent excise tax on contributions to overfunded schemes were driving factors behind the contribution holidays in the 1990s, and increase the potential risk of schemes becoming underfunded in the event of adverse market or other developments. Allowing more deductible (or at least not penalized) contributions, up to some reasonable overfunding limit (e.g., two or three years of "normal" contribution rates) would give sponsors and pension managers a greater ability to prudently plan for cyclical downturns.

Tax rules for savings products play a strong role in determining how individuals save (Box 3.3). Tax rules are generally designed to give preferential treatment to retirement savings, and as an incentive for individuals to start saving early. Indeed, if private savings are insufficient to ensure adequate old-age income in the long run, the cost of providing a safety net will ultimately fall on the government (via Pillar 1). As such, the fiscal cost of tax incentives for retirement savings may be viewed as preventative of potentially much larger costs that may be incurred later to support persons with inadequate pension savings.

However, it remains unclear whether tax incentives help raise overall pension savings, or merely shift existing savings. In particular, complex taxation regimes favoring certain types of pension plans may simply reallocate savings with little or no increase in the overall savings level. Empirical evidence is mixed, but

[25]See, for example, Schieber (2003) and Deutsche Bank Research (2003).

Box 3.3. The Tax Treatment of Pension Plans: a Comparison for Selected Industrial Countries

The tax treatment of pension plans in most OECD countries is broadly as follows (see the Table):

- *Contributions* by employees into approved pension schemes are deductible from the employees' taxable gross income (i.e., they are made before tax), and contributions by employers are deductible from the employer's earnings. In general, the total deductible contributions are limited to a maximum percentage of the employee's income.
- *Income* earned by approved pension funds from their investments is exempt from tax.
- *Pension income* received by individuals is normally subject to tax on the same basis as wages, and early distributions or distributions less than a minimum required level are both generally subject to additional taxes.

Tax systems usually treat qualified pension plans preferentially, with the net fiscal cost of these incentives varying widely in the countries shown in the Table. The fiscal cost is measured as the difference, over the length of the investment, between the amount of taxes collected when (a) the money is saved in a pension plan and (b) if it were invested in a benchmark non-retirement saving vehicle. Estimates for 2000 range from 1.7 percent of GDP in the United Kingdom and 1.5 percent in Switzerland, to 1.0 percent in the United States and the Netherlands, and 0.2 percent in Japan. However, the revenue forgone from tax incentives for private pensions remains a small fraction of the governments' spending on public pensions. In Germany, spending on public pensions was about 100 times larger than the forgone revenue from pension savings in 1997 (0.1 percent of GDP), while it was eight times in Japan, seven times in the Netherlands, six times in the United States, and three times in the United Kingdom.

However, poorly designed tax systems may result in simply substituting one form of savings for another, with little or no additional pension savings, and larger deadweight losses. Complex taxation regimes can generate distortions in favor of one type of pension plan versus another, or in favor of pension plans relative to other saving vehicles. There have been moves to simplify tax regimes and, in some countries, grant a single tax treatment for all types of occupational pension schemes. In France, pension reforms have set up a new legal framework for all private retirement savings (Pillars 2 and 3), consisting of an annual global tax deduction. The same global approach, encompassing Pillars 2 and 3, has been introduced in Germany, but the complexity of tax incentives and savings subsidies is inhibiting the take-up of retirement savings products.

While an important goal of tax incentives targeting occupational pension funds and other retirement saving is to raise the level of national savings, empirical evidence in this regard is mixed. In general, studies have found a minimal impact of occupational pension plans on national savings. However, many methodological issues affect the reliability of the results. A recent survey (OECD, 2004b) finds that about 60 to 75 percent of savings in tax-favored pension vehicles simply displaces other savings. Some studies also indicate participation rates in pension schemes are affected by taxes. A U.S. study (Reagan and Turner, 2000) found that a 1 percentage point increase in marginal tax rates leads to a 0.4 percentage point increase in the proportion of full-time employees participating in a pension plan.

Tax Treatment of Pension Plans

Countries	Contributions	Fund Income	Pension Benefits: Annuities	Pension Benefits: Lump sum
France	T/PE[1]	E	T/PE	T/PE
Germany	T/PE	E	T	T/PE[2]
Italy	T/PE[3]	E	T/PE[4]	T/PE[5]
Japan	E	E	T/PE	T/PE
Netherlands	E	E	T	T
Switzerland	E	E	T	T
United Kingdom	T/PE	E	T	T/PE[6]
United States	T/E[7]	E	T/E[8]	T/E[8]

Source: OECD (2004b).

Legend: T = taxed; E = exempt or deductible; PE = partially exempt or deductible.

[1]Deductible up to 19 percent for up to 8 times the annual social security ceiling (€44,360 in 2003).

[2]Tax-free allowance of 40 percent of pension payments granted up to €3,072 at age 63 or higher.

[3]Tax exempt up to 2 percent of gross employee earnings.

[4]Taxed only for 87.5 percent of their gross amount.

[5]Taxable base limited to the part over the employee's contribution to the fund.

[6]Tax-free lump sum of up to 25 percent of fund value.

[7]Exemption up to $12,000 for 401(k) plans (employees) and up to 3 percent of employee compensation (employers matching dollar for dollar contributions). Contributions to Roth IRA are not tax deductible.

[8]Income from Roth IRA is tax exempt.

a recent survey (OECD, 2004b) finds that about 60 to 75 percent of savings in tax-favored vehicles represent a reallocation from other savings (see Box 3.3).[26] Even such a reallocation of savings, however, may be beneficial in encouraging retirement planning if it represents a shift from short-term to longer-term and more stable savings.

Regulation

Supervision of pension funds traditionally has been conducted by bodies primarily concerned with labor and benefits, rather than financial markets. Thus, to date much of pension fund regulation has focused on the protection of pensioner and employee rights, and ensuring that pension fund assets are segregated for the benefit of employees, rather than reviewing the risks and long-term dynamic process of assessing whether the obligations will be met. Nevertheless, pension regulators often set minimum funding requirements and, in some cases, restrict certain investments or asset holdings, and thus influence investment behavior.

The choice of the discount rate for minimum funding requirements heavily influences pension fund asset allocation strategies.[27] Pension fund managers wishing to limit the volatility of their regulatory funding ratio may hold a larger allocation of assets with a high correlation to the discount rate used for liabilities. Corporate bond yields are increasingly used by regulators as the discount rate for liabilities, and this should increase pension funds' demand for credit instruments. In the United Kingdom, discount rates based on inflation-linked yields stimulated growing demand for such products. In the late 1990s, a shift to government yields, at a time of shrinking government debt supply, led to very low (and at times quite volatile) yields on these instruments. The more recent move to AA corporate bond yields provides a wider range of potential issuers for investment and hedging purposes, and removed the regulatorily driven pressure on government yields.

In the United States, the discount rate for funding calculations has been temporarily amended to a corporate bond rate, in an effort to provide short-term relief to underfunded plans. For two years, the discount rate used to determine DB scheme liabilities and sponsor companies' required contributions (as well as their PBGC premiums) will be a four-year weighted average of long-term high-grade corporate bond yields, replacing the 30-year U.S. treasury bond yield. In addition, certain industries (for example, steel and airlines) benefit from specific financial support—for instance, only 20 percent of annual contributions that would be otherwise required to address underfunded situations are to be contributed each year, thus spreading out the required increased payments—(Federal Deposit Insurance Corporation, 2004).

Regulations also influence asset allocation through "prudent person" rules and formal limits on certain investments. In many countries, regulators explicitly restrict the range of investment options by imposing quantitative investment limits, usually by asset class (Yermo, 2003). Although some countries continue to place upper limits, for instance, on investments in foreign securities, regulatory constraints on pension fund allocations rarely act as a major constraint on investments today.[28] The "prudent person" rules generally establish a principle of "diligence that a prudent person acting in a like capacity would use" (Galer, 2002). Fear of liability under those rules can lead fund managers to invest in portfolios that are substantially similar to their peers, and

[26]OECD (2004b).

[27]See, for example, Blake (2001).

[28]In the past (as described earlier), Japanese restrictions on allocations both to equities and to foreign securities acted as a strong constraint on pension fund allocation strategies, but these were abolished in 1997.

therefore can constrain pension funds from developing innovative or new approaches, and quite possibly from developing more modern risk management approaches. It can also induce herd behavior, and thereby introduce more volatility to capital markets.

Historically, many industry observers described pension fund regulation as unsophisticated in dealing with solvency and risk management, but there are signs of change. The regulatory factors mentioned above do not deal explicitly with the risk of investment portfolios. They often focus, in a more limited way, on the current level of funding, and are based on a variety of qualitative assumptions about future performance, and not on the risks inherent in the pension fund's asset-liability mix. However, some regulators are beginning to take a more sophisticated approach to evaluating the risk profile of pensions. In the Netherlands, a combined regulator has been established for insurers and pension funds, the *Pensioen & Verzekeringskamer* (PVK), and its merger with the banking regulator is expected to be formally completed in January 2005. PVK is importing many of the risk principles and measures applied to financial institutions into its pension supervision (Box 3.4). In addition, pension guarantee funds, like the PBGC or the Pension Protection Fund (PPF) being developed in the United Kingdom, are considering taking account of portfolio risks in the premiums they establish for individual pension plans. The developments essentially act to introduce risk-based capital or funding requirements to the pension system.

Initial steps have been proposed to establish international minimum standards for pension regulation. The OECD (2004a) recently issued *Core Principles of Occupational Pension Regulation*. While rather general in scope, they have proposed principles relating to, among other things, full funding of pension schemes and the enhancement of portability. We encourage further progress to apply and develop principles such as these.

Pension Guarantee Funds

The social objective of encouraging and protecting private pension savings has also led to the creation of pension guarantee or insurance funds. Guarantee funds are intended to diversify the risk of pension fund failures among the general population of pension plans, and should eliminate or (at least) reduce the potential cost to the government, if it were to act as the ultimate safety net for pensions. Guarantee funds are likely to increase in importance, as more countries look to increase the role of private pensions. The United States (PBGC), Germany *(Pensions Sicherungs Verein)*, and Switzerland (the Guarantee Fund) have long-standing insurance funds, and the United Kingdom is looking to establish such a fund (PPF).

However, this insurance protection may create other risks, depending on how guarantee funds are designed or operate. Most importantly, guarantee funds may generate moral hazard, to the extent they lead weaker sponsors to increase investment risk in the pension fund in the hope of reducing or limiting contributions. In the United States, for example, PBGC "risk-based" premiums relate only to the degree of underfunding and do not take into account the asset mix or liability structure. In addition, if a guarantee fund's own investment portfolio tends to have a similar asset mix as that of the covered pension funds, then the guarantee fund may be experiencing difficulties when claims from distressed pension funds are greatest. This may be exacerbated if pension funds tend to become underfunded when sponsor companies face more difficult business conditions (i.e., cyclical).[29]

[29]These challenges are illustrated by the PBGC, whose deficit reached a trough of over $11 billion at the end of its 2003 financial year, after having a surplus of $10 billion in 2000.

Box 3.4. Proposed Risk-Based Capital System for Pension Funds in the Netherlands

A proposed redesign of pension fund supervision in the Netherlands aims to ensure that pension funds remain fully funded at almost all times. Strict rules are being proposed for the rebuilding of funding levels in pre-specified timescales, either by increasing funding or reducing the indexation of benefits. Pursuant to the proposal, three parallel funding tests would be applied:

- *a minimum test*, requiring pension funds to maintain a minimum 105 percent funding ratio, even if their assets and liabilities are perfectly matched;
- *a continuity test*, requiring pension funds with conditional indexation clauses to have a long-term plan to meet their conditional goals during the next 15 years; and
- *a solvency test*, reflecting the composition of the fund's assets.

The solvency test, in particular, would introduce an innovative risk-based capital framework for pension funds. The risk parameters would be set so as to guarantee at a 97.5 percent confidence level that the funding ratio will stay above 105 percent over one year (taking account of expected contributions and expenses during the year). In other words, the funding ratio for funds meeting this requirement would only be expected to fall below 105 percent once every 40 years.[1] If the funding ratio fell below the risk-based floor, the fund would be granted a period of 15 years to address this gap (either through increased contributions or reduced investment risk). This risk component is meant to provide, like Basel II, a standard risk measure set by the supervisor, or alternatively allow funds (where appropriate) to use their own risk models and capital calculations.[2]

For the standard calculation, assets would be marked-to-market, and liabilities measured with a "market" yield curve. The discount rate would be set according to the duration of liabilities, and may reflect a government yield curve. The volatility parameters for assets would be based on a long-term historical run of data, reflecting the long-run orientation of pension funds. Liability measures also are expected to assume further increases in longevity (e.g., a two-year lengthening of average life spans).

Companies would also be required to state whether they have a "conditional" or "unconditional" inflation-indexation policy for pensions. If the policy is unconditional, the 105 percent regulatory floor would need to be against inflation-linked liabilities. However, if the policy is conditional, liabilities need only be measured in nominal terms. Since most pension funds seem to have opted for this conditional form, benefit commitments would generally be assured in nominal terms, and indexation would be contingent on investment performance or a company's willingness (but not legal commitment) to increase contributions. This requirement is viewed as a means to communicate the risk and protections provided to pension beneficiaries.

Overall, the proposed rules will give pension funds multiple hedging goals. Such a regulatory framework will lead pension funds to view asset-liability management (ALM) as an exercise in hedging both nominal liabilities (to meet their supervisory funding floor) and, possibly, real liabilities (to meet a conditional indexation goal, if retained). Which of these aims is more important will depend on their funding position. Weaker pension funds may begin hedging with bonds and abandon an indexation goal, while stronger funds, operating above their risk-based capital floor, may continue to target higher real returns, using greater amounts of equities and index-linked bonds, where available. However, many funds are expected to pursue a mixed approach, holding nominal bonds to meet their 105 percent liability floor, and investing the surplus in riskier assets in order to possibly achieve indexation goals. While Dutch pension funds currently tend to hold diversified portfolios (with a typical portfolio consisting of 50 percent equities, 40 percent bonds and loans, and 10 percent real estate and other investments), some funds have already reduced their equity allocations and sought to increase the duration of fixed-income assets to meet the proposed supervisory framework. However, to date such portfolio changes have not been widespread.

[1]Although the exact parameters have yet to be established, the supervisor estimates that a fund invested 50/50 in bonds and equities, and with a typical bond duration profile of five years, could be expected to have a minimum risk-based capital requirement of 130 percent of projected liabilities.

[2]The supervisor expects about 10 to 20 of the largest pension funds to apply internal models, and others to use the standard measures.

We support the inclusion of more risk-based elements in the design of guarantee funds. Risk-based premiums are being considered in the United Kingdom that may (at a minimum) take account of the investment or market risk in pension fund portfolios. More generally, risk-based premiums could be based on various criteria, including funding levels (based on accumulated benefit obligations, or ABOs, which seem particularly appropriate for an insurance fund), asset composition, liability structure (e.g., average maturity or duration), and degree of asset/liability matching of the pension fund.

Finally, whether and how guarantee funds or regulators should take account of the sponsor company's financial strength remains an open question. In principle, the cash flow and balance sheet strength of the sponsor company should play a role in determining the pension fund's ability to meet its liabilities. However, in practice, the great diversity of companies across a wide range of industries would make the evaluation of their financial strength an even more difficult task for supervisors than they currently face for single industries, such as banking or insurance. Moreover, the deterioration of a pension plan's funding level and/or an increase in its holding of "risky" assets may reflect its own ability (or not) to support the pension fund, and therefore these criteria may satisfy the supervisory need to set objective risk-based premiums.

Accounting

Accounting is frequently cited as the most important factor affecting pension fund management, and the shift from DB to DC or hybrid schemes.[30] Pension obligations can introduce volatility in the sponsor company's financial statements, depending on how they are measured and recorded. Indeed, industry observers frequently assess that a move to market-based, fair value accounting principles would significantly increase the shift away from DB pension plans and may encourage greater short-term trading and investment styles.

Current Practices

In most jurisdictions, the impact of short-term pension gains and losses on the financial accounts of sponsor companies are smoothed over several periods. Historically, a variety of smoothing practices have been applied to various components of a pension sponsor's financial statements, including investment returns (actual against expected), and actuarial gains and losses (i.e., changes in liability values). The current international accounting standard (IAS 19) and national accounting standards in most of continental Europe, Japan, and the United States incorporate various smoothing mechanisms (see Box 3.5).

Another important accounting principle is the choice of the discount rate used to measure pension liabilities.[31] This rate has a significant influence on the measurement of the obligation, as a higher rate reduces the present value of pension obligations. Indeed, some analysts have suggested that the rate selected or movements in rates have a greater influence on pension fund balance sheets than asset performance, given the typically long average duration of liabilities. Some jurisdictions have allowed the same discount rate to be used for liabilities as for expected returns on assets, thus further smoothing the impact of market movements (such as the projected yield on equities). However, in accordance with IAS 19, many jurisdictions now require a rate approximating a high-quality (AA or equivalent) corporate bond yield. In other countries, like Germany, the discount

[30]See, for example, CIEBA (2004).

[31]The discount rate used in the financial accounts is not always the same as the discount rate used for regulatory purposes.

Box 3.5. Comparison of U.S. FAS 87, U.K. FRS 17, and Proposed IAS Standards

Approaches to pension accounting differ significantly across countries. The differences largely relate to the degree to which the accounting permits smoothing in consideration of uncertainties associated with pension-related costs and obligations, the subjective and complex process of estimating the obligations, and the long-term nature of the obligation. This box compares three pension accounting regimes, namely, U.S. FAS 87, U.K. FRS 17 (to be fully implemented in January 2005), and proposed IAS requirements (IAS 19, effective January 2005).

How Pension Assets and Obligations Are Measured and Presented in Corporate Balance Sheets

Under all three regimes, the sponsor company recognizes pension obligations net of pension assets. However, in measuring pension assets and liabilities, the U.S. regime (FAS 87) allows more smoothing than FRS 17. Both IAS 19 and FAS 87 permit amortization of unrecognized gains or losses over the remaining working life of active employees, but also permit more rapid, and even immediate, recognition. Under IAS 19 and FRS 17, pension assets are measured by market values. Under FAS 87, pension assets are measured at either market value or a calculated value that recognizes changes in fair value over not more than five years (referred to as "market-related value"). Under all three regimes, liabilities are measured by the projected benefit obligation (PBO). PBO measures obligations on the assumption that the plan remains a going concern, and so is meant to capture the impact of future wage increases and unvested benefits, actuarial assumptions, and discount rates determined as of the current measurement date. Pension liabilities, under FAS 87, are measured based on the PBO with a requirement to recognize an additional minimum liability if the accumulated benefit obligation (ABO), which represents essentially a liquidation value, exceeds the fair value of plan assets; both the ABO and PBO amounts are disclosed in the notes to the financial statements.

If there is a net surplus in the pension fund, the sponsor company may record all or part of it as an asset. While FAS 87 sets no explicit limit on the amount that may be recognized, IAS 19 and U.K. FRS 17 limit it to the amount that would be recoverable by the sponsor through a refund or a reduction of future contributions.

Regarding the discount rate to be applied to pension liabilities, IAS 19 prescribes yields of high-quality corporate bonds; U.S. FAS 87 gives a choice of either high-quality corporate bonds or insurance annuity rates; and U.K. FRS 17 recommends AA or equivalent corporate bond yields.

Smoothing Principles in the Profit and Loss Account

In general, when evaluating pension fund investment results, sponsors may take a long-term view by smoothing short-term performance volatility. For this purpose, IAS 19 and U.S. FAS 87 reflect expected returns rather than actual returns on pension assets. The difference between actual and expected returns is subject to amortization in future periods, or at times may be entirely deferred if it does not exceed a minimum threshold. The rate of expected return reflects each company's view about the future performance of its pension portfolio.

Under IAS 19 and U.S. FAS 87, smoothing also exists in actuarial gains and losses (i.e., projected liabilities), which are also amortized and reflected in earnings over future periods. If the difference between actual and expected returns, together with other actuarial gains or losses, is within a range of 10 percent of the higher of plan assets or liabilities (the "corridor"), the amount is not required to be amortized. Under IAS 19 and FAS 87, plan sponsors may elect a systematic method of amortization that must be applied consistently (see the Table).

The United Kingdom's FRS 17 also uses expected returns; however, the differences between expected and actual returns, as well as actuarial gains and losses, are recognized in the period in which they are incurred in a separate *Statement of Total Recognized Gains and Losses* (STRGL). Use of the separate account, instead

Important Differences in the Three Accounting Standards

	IAS 19	U.S. FAS 87	U.K. FRS 17
Measurement of pension obligations	Projected Benefit Obligations (PBO).	PBO. Accumulated Benefit Obligations (ABO) (minimum recognition): PBO and ABO are reported in the notes to the financial statements.	PBO.
Measurement of pension plan assets	Fair market value: no smoothing allowed.	Market-related value: companies are permitted to use fair market value or a calculated value that smoothes up to five years for purposes of determining the asset value for use in the return on assets and 10 percent corridor computation. The value of assets disclosed in the notes is the fair market value.	Fair market value: no smoothing allowed.
Smoothing of gains or losses in earnings statements	Unamortized past service costs are amortized over the remaining service period. Actuarial gains or losses within a "corridor" may be ignored (the higher of 10 percent of the present value of the obligation or 10 percent of the market value of assets). Actual gains or losses over a "corridor" may be amortized over the remaining working life of active employees (immediate recognition is permitted).	Unamortized past service costs are amortized over the remaining service period. Actuarial gains or losses within a "corridor" may be ignored (the higher of 10 percent of the present value of the obligation or 10 percent of the market-related value assets). Actual gains or losses over a "corridor" may be amortized. The minimum required amortization is based on the remaining working life of active employees.	Unamortized past service costs are amortized over the period in which the benefits vest. The difference between actuarial gains, losses, and adjustments is recognized in the period incurred in a separate note in the financial statement (STRGL), i.e., not smoothed.
How future investment returns are calculated	Long-term estimates of expected returns.	Long-term estimates of expected returns.	Long-term estimates of expected returns. However, the difference between expected and actual returns is recorded in STRGL.

Sources: Standard & Poor's (2003); and Financial Accounting Standards Board.

of direct reporting in the profit-and-loss statement, is an attempt to avoid introducing excessive volatility into headline income figures. Recently, the IASB has issued a proposal on the possible introduction of a separate account to allow companies to report the annual cost (with or without smoothing). It should be noted that IASB and U.S. FAS 87 also allow immediate recognition of the difference between actual and expected returns at the company's option.

rate is fixed by the authorities and only rarely adjusted.

Recent Trends

The trend among standard setters is toward limiting the scope for pension fund smoothing, by introducing more market sensitive or fair value principles. The United Kingdom is moving toward a fair value approach with the introduction (to be completed in 2005) of a new accounting rule (FRS 17). Under this rule, although the "headline" profit and loss account continues to show the actuarial version of pension gains and losses, the

unsmoothed mark-to-market version of the gains and losses are shown in a separate *Statement of Total Recognized Gains and Losses* (Box 3.5). The International Accounting Standards Board (IASB) has also introduced changes in its pension accounting standards that will permit reporting according to fair value principles in a form similar to the United Kingdom—EU countries agreed to adopt IAS 19 in January 2005.

In many jurisdictions, steps are also being taken to ensure greater disclosure of a pension fund's financial condition. Pension liabilities are increasingly reflected like other debt obligations of the sponsor company. Japan began recording pension liabilities as debt obligations of the sponsor in 2000—previously Japanese companies were required only to recognize annual contributions as an expense in the profit and loss account. This move has forced many small and medium-sized enterprises to terminate their pension plans due to the sudden reporting of large funding gaps in their balance sheets.

Potential Impact

The use of fair value accounting principles would address the arbitrariness that characterizes traditional pension fund accounting practices. It is widely recognized that the various smoothing mechanisms used in the accounting for pension plans introduce an arbitrary and inconsistent application of current accounting standards, which some argue substantially limits the usefulness of financial reports. In particular, the use of subjective assumptions, which frequently vary between companies, may hamper comparative analysis, and the financial risks borne by the sponsor companies may be underestimated (Shilling, 2003).

However, it is also argued that by generating greater volatility in sponsor companies' balance sheets, fair value accounting principles may misrepresent (i.e., over- and understate) a pension fund's financial condition and accelerate the shift away from DB plans. Recent experience in the United Kingdom indicates that fair value principles may accelerate moves to DC and hybrid plans, which allow companies to reduce their risk concerning pension obligations and transfer investment and market volatility to employees/beneficiaries. Similar effects can be seen in Japan and the United States. Greater sensitivity to market price volatility may also in the future encourage fund managers to focus on short-term asset management strategies, or alternatively to seek to immunize themselves from short-term accounting volatility by reallocating their portfolios from equities to bonds.

Rating Agencies

Rating agencies now explicitly recognize the underfunded amount of pension plans as debt of the sponsor company. The rating agencies treat the difference between the PBO and the fair value of plan assets like any other long-term debt obligation of the sponsor company,[32] and use various adjustors to unwind some of the smoothing introduced by current pension accounting practices.[33] This shift in ratings analysis has resulted in several ratings downgrades at least partly based on pension issues, particularly in continental Europe. Such actions often affect companies in older industries, with an aging workforce and/or a perceived weaker cash-flow strength or financial flexibility. Increased attention to the rating impact of pension funding levels seems also a factor in the shift from DB plans to DC and hybrid schemes.

Recently, some rating agencies have started to make explicit statements regarding pension investment strategies, giving greater support

[32]By accepting a portion of their compensation on a deferred basis, employees essentially become creditors of the sponsor company.

[33]See, for example, Moody's Investors Service (2003).

to fixed-income pension assets. Fixed-income assets are seen as providing greater security to beneficiaries—at the expense of higher returns. Most simply, based on this view, the more closely a pension's projected obligations are matched with a portfolio of high-quality fixed-income securities, the greater its ability to meet its liabilities as they fall due. While this analysis seems sound, the ability to achieve such asset/liability matching is difficult, and the availability of market securities may be lacking.

Asset Allocation and Risk Management

The ultimate purpose of pension schemes is to meet their committed future pension liabilities. The fund manager's duty is to manage the fund for the benefit of the plan members in order to meet those liabilities, rather than to earn an excess return. Given the liabilities' generally long-term structure, this implies a long-term focus to investment. A number of risks need to be managed as part of the ALM process, including the duration of both assets and liabilities, inflation, longevity, and the ability of the sponsor company to meet future contribution needs. Challenges and constraints also arise, such as those concerning the availability of appropriate financial instruments, the impact of pension fund performance on the sponsor company's accounts, and the general desire to keep the level of contributions down.

Asset Allocation

There is no consensus among pension and investment experts on the appropriate asset allocation for DB or hybrid pension funds. Although there are many different approaches to investment management for pensions, asset allocation approaches generally fall into one of three different styles.

Primarily Equity-Based

Many in the pension fund industry favor a portfolio consisting primarily of equities, largely because they believe that in the long run the extra return from equities will outweigh the short-term volatility. In their view, although equity returns can be volatile in the short run, equities are much more likely over the long-term average life of pension liabilities to outperform bonds, and thereby reduce contributions or allow for increased benefits. Accordingly, they also generally oppose "fair value" accounting methods, arguing that it does not reflect the long-term nature of pensions or pension investment.

Many advocates of this position also view equities as a better inflation hedge than nominal bonds, and that, given the lack of supply of long-dated bonds, equities are a more practical way to match the duration of pension liabilities. Equities are seen by some as a good inflation hedge because their value reflects future expected profits, and hence may be seen as likely to rise with future wage and price growth in the long term. Some also argue that equities have a much longer duration than bonds, because their dividends represent a stream of cash flows with no final maturity or because their price movements can be quite large in response to interest rate movements.[34] This would imply that they could be useful as a hedge for long-term liabilities. On the other hand, other market analysts find the correlation between equities and bonds is often weak, or too variable over time, to be relied upon as a duration hedge. The equity market fall in 2000–02, which effectively implied negative duration of equities for that period, was the largest two-year fall in major markets since the Great Depression, leading some to reduce their equity allocations. Nevertheless, supporters of an equity-based strategy argue that the high returns of the 1990s outweigh the two years of losses.

[34]For instance, Standard & Poor's (2004b) have estimated a current duration of 15 years for the U.S. equity market.

Primarily Bond-Based

A recent body of opinion favors a portfolio based wholly or primarily on fixed-income securities. The argument is that, as a pension fund's liabilities form a future stream of payment obligations that closely resemble a portfolio of bond payments, a bond portfolio can best provide the certainty that the pension fund will meet its liabilities as they fall due. At the same time, sponsor companies should not seek or accept additional business, leverage, or investment risks through their pension fund. Shareholders, it is argued, do not desire this additional market exposure. If shareholders seek a diversified portfolio of this type, they can more efficiently build one themselves.

Many companies indicated that they would consider moving to a much larger bond allocation if their funding ratio rebounded to 100 percent or more. The most publicized example of this strategy has been the U.K. retail firm Boots, which moved to a 100 percent bond allocation in 2001. However, the company has more recently announced that it intends to invest up to 15 percent in other assets, to better match very long-dated liabilities, which extend beyond 35 years, and for which it is not possible to purchase equivalent-duration bonds. A few other employers (in various countries) have also moved to a more bond-based investment strategy. However, many companies are reluctant to make significant short-term contributions or switch to currently highly priced fixed-income instruments given their current weak funding levels.

A "Balanced" Portfolio, with Bonds, Equities, and Other Assets

Some pension funds, and their consultants, argue that a diversified investment portfolio composed of a variety of asset classes offers the best way to balance risk and return. Pension fund managers supporting a balanced portfolio approach often also favor certain "alternative investments" (such as private equity, real estate, commodities, and more recently hedge funds) in addition to bonds and equities (Greenwich Associates, 2003). Fund managers may employ the balanced approach to seek to enhance return through active management of a variety of asset classes, while diversifying risk and perhaps matching near-term cash flows. Such an investment policy has also been attractive to funds (for instance in Switzerland or, historically, the Netherlands) that measured their liabilities with a relatively fixed discount rate and therefore had a fixed asset return target, or managed the assets against benchmark indices rather than against liabilities. The relatively small domestic markets in the Netherlands and Switzerland have also led funds in these jurisdictions to diversify internationally.

A vigorous debate is currently taking place in the pension fund industry on the merits of these different approaches. The debate on these different strategies is also closely related to discussions regarding broader risk management, and accounting and regulatory issues. To illustrate some of the arguments regarding the relative merits of bonds and equities, two U.K. market analysts whom we met during the preparation of this study agreed to provide short pieces on their differing analyses. These are presented in Boxes 3.6 and 3.7.

Policymakers need not take a view on optimal asset allocation, but should ensure that decisions are guided by appropriate risk management practices. Given the long-term nature of pension provision, some asset and liability risks certainly are being taken. These risks need to be understood and assessed by fund managers, and appropriate safety margins encouraged through risk management strategies (e.g., a prudent level of overfunding). Policymakers can encourage this through regulation and tax policy.

Risk Management

There is great variation in the sophistication of pension fund management. Some of the largest funds commit considerable staff and other resources to internal trading capacity,

Box 3.6. Defined Benefit (DB) Pensions and Corporate Finance Theory

Shareholders Are the End Risk Bearers

Default scenarios aside, shareholders in a corporation bear the asset versus liability risk within its pension plan (with gains or losses in assets reflected in adjustments to the contribution rate). Shareholders should therefore be broadly indifferent to the following three options: holding equities (say) within the DB pension plan of the company they invest in; holding equities of other firms directly on the balance sheet of the corporation; or holding these equities in the shareholders' personal portfolios. This analysis is similar in principle to the Modigliani and Miller (1958) indifference proposition. Furthermore, as with the Modigliani and Miller proposition, despite the apparent indifference at first sight, factors such as tax and frictional costs are the key to understanding optimal structures in practice.

Arguments in Favor of Matching

Among the reasons why a shareholder should prefer the assets and liabilities of a pension plan to be closely matched are:

- The company reduces the likelihood that financial losses in the pension plan disrupt the core business activity.
- The actions of management are more easily monitored and the scope for internal cash windfalls being lost or misallocated is reduced.
- Internal and third party management costs and fees are minimized.

The cost of defined benefit obligations cannot be reduced by investing in equities except in so far as the value of the benefits to plan members are reduced, by increasing default risk. Overall, shareholders can only gain by this if they can avoid the policy rebounding in the form of higher wage costs, adverse publicity, or government responses (e.g., restrictions on corporate activity).

Defined Benefit Liabilities Can Be Matched by Using Nominal or Inflation-Linked Bonds (or Swaps)

Debate over the close matching of DB liabilities often focuses unnecessarily on the link with future salaries. However, few would disagree that the accumulated benefit obligation (ABO) can be very closely matched with bonds without taking a view on future salaries, and, in fact, there are strong arguments in favor of viewing the ABO as the economic liability, on the grounds that increases in the liability due to future salary increases accrue only when the increases are awarded (see, for example, Exley, Mehta, and Smith, 1997). Valuing and hedging of the ABO with bonds thus forms the basis of a practical risk management approach.

Even if we consider projected benefit obligations (PBOs), in many plans the proportion of liabilities linked to future salary increases (and the duration of the linkage, which does not usually extend beyond retirement) may in practice be quite small. Furthermore, to the extent that liabilities are regarded as linked to future wages, the empirical evidence for a link between equities and salary growth is weak (see Smith, 1998), as is the economic justification. (Even if a link existed between aggregate corporate earnings and wages, this does not necessarily imply a link between earnings per share and wages per employee.) More practically, no proposed links have met the acid test of a workable hedging algorithm. Although less accurate than the ABO hedge, inflation-linked bonds also provide the best hedge for the salary-related element of a PBO liability.

Note: This box was prepared by Jon Exley of Mercer Investment Consulting.

risk analysis, and/or the management of external fund managers. In other cases, medium-sized (and some larger) funds have only a handful of employees to evaluate benefit obligations and determine asset allocation, and often have delegated much of the detailed work to consultants and external managers.

Box 3.7. Economics and Pension Fund Asset Allocation

The issue of asset allocation and pension funds has broad economic significance and raises important questions of long-run economic and financial relationships. In particular, it raises the question of whether a defined benefit (DB) pension scheme that is open and operated on an ongoing basis ought to be 100 percent invested in bonds, as some practitioners have proposed, or whether equities should play a substantial role, as is the case in most pension fund portfolios.

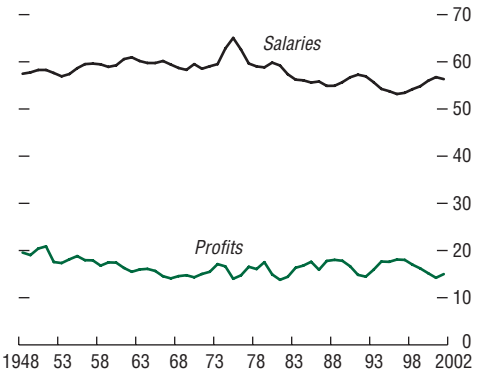
Salaries, profits, and dividends are all relatively stable components of GDP. As such, the established view has been that equities ought to be a good hedge against salary-linked liabilities (e.g., Black, 1989, in the United States and Blake, 2001, in the United Kingdom). Advocates of bond investments question this. Some have even suggested that the negative correlation of the two series shown in the first Figure means that claims on profits, such as equities, were not a good match for salaries (Exley, Mehta, and Smith, 1997). However, if the data are displayed in nominal terms over time (as in the second Figure), the relationship becomes clearer. To understand whether investment in equities should form a standard part of a pension fund's portfolio, the correct approach is to consider whether changes in the value of future salaries are correlated with changes in the value of future profits. Using rolling 25-year windows, Giles (2004) demonstrated that the correlation between changes in the present values of future profits and salaries was in excess of 80 percent. That is, holding a profit-linked security, like equities, would have been a highly effective hedge for salary-linked liabilities over the period.

Further arguments put forward in support of the proposition that funds should be 100 percent invested in bonds are also difficult to sustain:

- Pension funds should hedge expected projected benefit obligations (PBOs), and not merely the contractually certain accumulated benefit obligations (ABOs). In general, firms hedge because future prices are *not* contractually certain. Companies and pension funds that are operated as going concerns are concerned with *expected* liabilities, not just those that are contractually certain. This has fundamental significance when it comes to asset allocation.

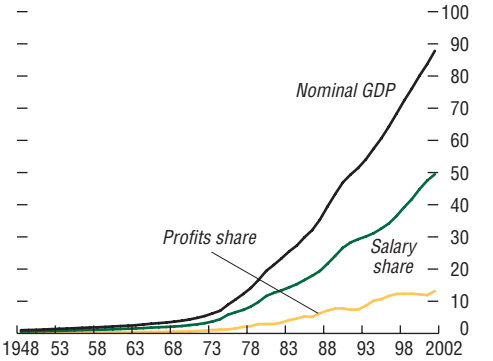
Note: This box was prepared by Tim Giles of Charles River Associates.

United Kingdom: Salaries and Profits
(In percent of GDP)



Source: United Kingdom, Office of National Statistics.

United Kingdom: Indexed Nominal GDP Shares
(1948 = 1)



Source: United Kingdom, Office of National Statistics.

- Unless salaries are completely diversifiable or deterministic, an economic valuation would not rely on a bond rate. An economically important variable, such as salary levels, will be highly correlated with systematic risk. The appropriate discount rate is likely to be close to the firm's overall discount rate or, if that is unknown, the weighted average return on all asset classes rather than a bond rate.
- It is futile to promote the superiority of an asset allocation policy if it is based on securities that are not available in sufficient quantity. When considering the matching of future salary obligations, 100 percent bond proponents suggest that pension funds should invest in index-linked bonds—in spite of the lack of supply. They simply make the assumption that governments or even corporations will alleviate the scarcity of index-linked bonds by issuing more. However, there is no obvious fundamental incentive for either to do so. Accordingly, it is possible that the market for index-linked liabilities could expand in the face of increased demand from pension funds but, in all likelihood, this would be at an equilibrium price that reflects an excess of demand over supply.

The Capital Asset Pricing Model (CAPM) and its extensions tell us that the notional "average investor" should hold a portfolio equivalent in its risk/return characteristics to the "market" of all assets. Pension funds do have peculiar characteristics, particularly DB schemes. Therefore, asset allocations may deviate from the market portfolio. It has not yet been demonstrated, however, that the difference between the average risk-reward trade-off, and that of pension fund members or sponsors, is sufficiently stark to justify a 100 percent bond portfolio. In fact, the available evidence supports the widely held view that equities are an important component of the portfolios of open DB pension funds.

Consultants have a significant influence over pension fund management. Many pension funds rely upon and commission their risk analysis to be done by external consultants. In addition, the corporate governance structure of pension funds, with the overall direction set by trustees or a benefits committee, which may have limited expertise on investment matters, leads to considerable reliance on consultants for expert advice. Nevertheless, consultants often seem reluctant to propose substantial changes in ALM strategies or portfolio composition, particularly if it would strongly deviate from their previous advice or with consensus industry practices. Therefore, historically pension fund strategies have been quite stable, but the reliance on consensus presents some risk of herding within the industry, and may retard the development of newer risk management practices.

Financial and risk management practices within pension funds still focus much more on the asset than the liability side of the balance sheet. This is a distinct difference from insurance companies, which traditionally placed much greater focus on liability risk rather than asset risk, as described in the April 2004 GFSR. With pension funds, this partly reflects the fact that assets are more easily adjustable (particularly in the short term) than pension liabilities. The stronger emphasis on assets also reflects the greater difficulty in recalculating liabilities than assets, with full actuarial recalculations typically only performed once every three years and partial updates (reviewing assumptions such as inflation, discount rates, and prospective investment returns) only once a year. As such, there is a tendency for funds to regard the value of liabilities as fixed between actuarial revaluations, and this has created much less focus on liability risk.

Therefore, many pension funds measure asset performance against broad market

indices rather than against the underlying liabilities. But the focus on such indices may distract managers' attention from the real goal (i.e., to ensure funds are managed to meet liabilities as they fall due), and may further increase the risk of herding. Moreover, in some jurisdictions, this passive investment style also led pension fund managers to pursue very short-term investment strategies, including chasing yesterday's attractive markets and returns.

Greater focus on ALM and risk management practices needs to be encouraged. There has been increased use of ALM by some pension funds, driven partly by the "perfect storm" of recent years, but also by greater sensitivity to market values and movements through new accounting standards and market-related discount rates for liabilities. Some of the more sophisticated pension funds have begun to use risk management techniques from other areas of finance, instead of a focus primarily on actuarial methods. Even if liabilities are recalculated infrequently, these funds now may employ stochastic approaches such as Monte Carlo simulations to study a variety of different scenarios and their impact on both the asset and liability side of the pension balance sheet. But there is much still to be done to encourage and employ ALM techniques more broadly in the pension industry.

Several types of risks must be addressed in the pension ALM process. Pension fund liabilities can vary through structural changes in the workforce, the longevity of pensioners, future salary increases for workers, and the indexation of payments to prices or wages. Structural changes in the workforce are hard to hedge through the asset portfolio. However, annuities can hedge longevity risk, and salary and inflation-protected pension benefits may be in large part hedged by index-linked bonds.

Index-linked securities may be very useful for risk management but, as noted, the supply of such instruments and their role in pension portfolios have been limited to date. Their limited use in portfolios partly reflects the limited indexation of pension obligations in some countries, and funding methodologies that do not fully reflect changes in inflation expectations. Of course, the current low real yields available on index-linked securities (especially since most of the supply is of government debt) may also limit demand. But changes in accounting and regulatory principles could increase demand, and this could in turn stimulate increased supply from a wider range of issuers, including corporates.

A modest allocation to alternative investments may also play a useful role in pension fund portfolios. Currently, many pension funds have alternative investment allocations of around 10 to 15 percent, primarily in private equity and real estate. Hedge funds are also being increasingly considered, although (despite some media reports) aggregate amounts invested, or reasonably expected to be invested in the immediate future, remain modest, and few pension funds have made allocations to hedge funds above 5 to 10 percent of their investment portfolio.[35]

Increased international investment brings challenges as well as benefits for risk management. As described earlier, international investments may provide both diversification and higher returns. However, they will also require a greater focus on currency risks and credit risks to a wider range of countries, borrowers, and instruments, as well as broader progress on addressing obstacles to international capital mobility.

Pension funds should be free to choose their desired asset mix, within the bounds of prudent and (ideally) risk-based funding principles. A degree of overfunding can provide a prudent cushion against the risk of market

[35]See, for example, Astérias (2002).

movements. Merely aiming to achieve a funding ratio of 100 percent makes a pension fund's future level of contributions or benefits more sensitive to investment and market risk. Pension funds can increase the likelihood that their assets will be able to meet their liabilities by aiming to achieve a prudent measure of overfunding—the amount of which can be thought of as the "capitalization" of the fund—taking into account the level of risk arising from the asset mix and the financial strength of the sponsor company.

Within this analysis, the financial strength of the sponsor company is an important (and often overlooked) factor when considering ALM or risk management of pension funds. The strength of the sponsor is important in assessing the ability of a pension fund to meet its PBOs as a going concern (while the strength of the pension fund as a stand-alone entity may be more important to assess the ability to meet ABOs in the event of a plan closure). Financially strong companies in growing industries may have more flexibility to take investment risk and manage short-term funding shortfalls. On the other hand, older-industry firms with a higher proportion of retirees to active workers, and with large pension obligations in relation to the size of the overall company or with less dependable cash flows, will have less flexibility to increase contributions as needed. Therefore, we believe the appropriate funding level, or the risk profile of a pension fund's portfolio, should not be considered in isolation from the financial strength and flexibility of the sponsor company.

In sum, policymakers should seek to ensure that a pension fund's obligations can be met by its funding and investment strategy, consistent with its risk management practices. During our study, we frequently observed the stronger or "wealthier" sponsor companies moving to remove risk from their pension fund and more often seeking to match or overfund projected liabilities, while weaker firms continued to pursue riskier investment strategies in the hope of "growing out" of underfunded positions. In this respect, the existing regulatory incentives and structure for pension funds are producing very different behavior when compared to life insurers, many of whom reallocated from equities to bonds in response to weakened solvency positions. Although this may in part also reflect the longer time horizon and liability structure of pension funds, it suggests that risk-based approaches to funding and related regulations may be useful to encourage greater risk management practices by pension funds.

Conclusions and Policy Recommendations

The growth of funded pensions and the growing emphasis on risk management should strengthen the role of pension funds as stable, long-term institutional investors. Overall, this development should enhance global financial stability.

Pension funds and their weakened financial position have received significant attention in recent years. No doubt, this can be attributed in large part to the 2000–02 equity market decline and falling interest rates. However, the deeper causes of this deterioration have been building for many years. Nevertheless, pension funds have a very significant role to play in mature market societies, particularly as providers of retirement income and as investors of long-term savings. At present, a number of factors challenge the very existence of traditional pension structures in many advanced economies, and the following discussion and recommendations are intended to highlight how pension funds may continue to be a home for long-term savings, and thus an important contributor to social and financial stability goals. The recent partial recovery in funding ratios (arising from improved market conditions, particularly rising market interest rates) provides a window of opportunity for policymakers to introduce measures to encourage better risk management practices, and to reduce the risk of another cycle of over- and underfunding.

Promoting Sufficient Retirement Savings

As a first priority, policymakers need to more effectively communicate the pension and savings agenda. In virtually every jurisdiction, public and private sector officials we met highlighted the need to better communicate the pension challenges and policy priorities. While this seems universally the case, it is perhaps particularly true in countries where the bulk of pension benefits have been traditionally provided by the state. Indeed, in part due to insufficient communication, some recent pension reforms aimed at the household sector (Pillar 3) have received little support or enthusiasm. The long-term need for greater savings is not going to dissipate, and for current pension reform efforts to succeed a broad-based understanding and support by the general public is necessary.

Policymakers should provide effective incentives for the development of long-term savings. This does not require legislation or regulation that provides detailed product design, but rather the development of a tax and legal environment that is relatively simple, stable, and facilitates retirement savings growth. The private sector is best equipped to design and provide a wide variety of savings products, and the public sector should focus on building the necessary framework and incentives. If the incentives are properly established and communicated, we believe attractive products will emerge.

In designing a multi-pillar approach to pension provision, policymakers may be best served by targeting a relatively balanced contribution from each pillar. With demographic and cost pressures increasing on Pillar 1, the contribution of state plans is projected much lower in most advanced economies. Increasingly, many state pension programs see their goal as providing a much lower or even minimum level of replacement income. Therefore, efforts to facilitate larger contributions from Pillars 2 and 3 are a practical necessity. As such, the role of retirement savings through occupational pension schemes (Pillar 2) and/or individual savings schemes (Pillar 3) will need to grow significantly, as individuals seek to supplement state benefits. However, due primarily to differing national preferences for risk sharing between sectors, these pension and savings programs will likely be designed very differently.

As part of pension reform efforts, the workplace (Pillar 2) would seem to be the most efficient location to organize and accumulate retirement savings. Through occupational pension schemes, employers can most effectively organize the funding of employees' retirement savings. Moreover, employees seem more prepared to contribute wages at source to long-term, work-related, pension schemes, whereas efforts to attract funds in various Pillar 3 schemes in many mature market countries have experienced less success. In addition, by bundling employee savings and creating a menu of financial products, employers are well positioned to negotiate lower investment costs and obtain professional advice to the benefit of employees and beneficiaries.

Traditional DB schemes and principles should not be uniformly discarded, and we believe the development of hybrid plans should be encouraged. Rather than being a flawed concept, many traditional DB plans and benefits were mispriced and lacked adequate funding strategies and risk management practices, as revealed by the recent market slump. Nevertheless, at least some of the risks related to pensions may be better managed at the institutional than the individual level, and various hybrid plans that aim to guarantee a minimum level of benefit and corporate pension contribution, while sharing some (not all) of the investment and longevity risks with employees, may strike the right balance. A particular concern of many sponsors and industry analysts is longevity risk, and special consideration for the extreme elderly may support the broader market availability of annuities and related insurance products. At the same time, Pillar 2 schemes must be suitable for a more mobile workforce, including portability, proportionate benefits and vesting schedules.

Promoting Strengthened Risk Management Practices

Policymakers should consider ways to facilitate the development of certain markets, including more long-term (20 years and longer) fixed-income and index-linked products. Such securities and markets are necessary to allow pension funds to better match assets and liabilities, as well as to facilitate the supply and pricing of annuity and long-term savings products by traditional market participants, such as insurance companies. We believe public sector leadership in this area (including issuance) will be followed by greater private sector issuance. In several jurisdictions, the number of institutions providing annuity products continues to decline, and pricing is increasingly unattractive or unavailable due to the limited supply of market instruments to hedge such risk.

Financial stability can be enhanced by regulatory policies that are more closely aligned with the purpose and liability structure of pension funds, while encouraging the development of better risk management systems. Regulators should encourage funded plans to develop investment portfolios (including international investments) appropriate to the pension's liability structure. Such measures would encourage fund managers to focus more on risk management, rather than benchmarking performance against various indices, and should also reduce the risk of herd behavior. This may imply quite different allocations between equities, bonds, and other assets by different pension funds and, possibly, more fixed-income investments by pension funds with a rapidly aging workforce or closed to new participants.

Tax and related regulations should be designed to reduce or remove barriers to prudent, continuous funding policies. One of the key reasons for the contribution holidays in the late 1990s was the loss of preferential tax treatment (i.e., deductions) or even tax penalties applied to further contributions once pension funds became somewhat overfunded. The inability to continuously fund and to build a funding cushion left many funds exposed to a market downturn, and created the need for relatively large contributions to meet minimum funding standards. Tax rules that would allow a certain level of annual contributions, including as tax deductible payments, even during overfunded periods, and which do not penalize firms for building up a prudent funding cushion (e.g., two or three years of normal contributions), would help to encourage long-term, stable pension strategies. Moreover, based on OECD statistics, such policies should not represent a material drain on tax revenue. Of course, a balance has to be reached to prevent pension funds from becoming tax shelters, and thresholds for continued tax deductibility could perhaps be coordinated with risk-based concepts of adequate funding levels set by supervisors.

Risk-based approaches to supervision and to guarantee fund premiums should be enhanced. Guarantee fund "risk-based" premiums need to take account of the pension fund asset-liability mix, and not only the level of current funding. This should provide a fairer distribution of guarantee funds' cost, reduce moral hazard risk, and encourage better risk management practices. The Dutch proposal for risk-based standards is an interesting and innovative approach, applying supervisory expertise from other financial sectors. It would seem useful to also consider the financial strength of the sponsor in setting risk-based capital or premiums; however, we recognize the practical difficulties, and we encourage the adoption of risk-based approaches whether or not that factor is included.

Policymakers and standard setters should ensure that financial accounts provide an accurate reflection of the financial condition of companies, including their pension plans, and we continue to encourage enhanced disclosure standards rather than an emphasis on single-point accounting measures. Our recommended approach here is similar to that expressed in the April 2004 GFSR for insurance companies. A factor frequently cited by pension fund managers for the move away from DB plans is the trend to fair value

accounting principles in many mature market jurisdictions. While this view may understate the demographic and cost pressures also at work against DB plans, it is not clear that the volatility associated with fair value accounting measures accurately reflects a pension fund's true risk profile or properly focuses the management of pension risks. We believe a broader disclosure of the asset and liability structure (including the maturity profile of pension obligations, and market and interest rate sensitivities) of funded pension plans, and a discussion of risk management practices and funding or capital cushions, would provide investors and beneficiaries with appropriate information. Indeed, while we support the approach of rating agencies to treat the unfunded portion of pension obligations like other forms of corporate debt, the agencies acknowledge that such accounting volatility creates its own ratings pressure and possibly more immediate funding constraints. Sophisticated investors are certainly aware of pension issues, and relevant disclosure should ensure broader market understanding of pension risks.

An important contribution to pension reform and the growth of long-term savings may include the promotion of international diversification of pension assets. In time, a shift of capital from advanced economies to younger and faster-growing economies may provide substantial benefits in terms of higher returns and diversification and, ultimately, in helping advanced economies deal with the macroeconomic implications of aging. This reinforces the need of policymakers to address the numerous frictions that continue to limit international capital mobility, and the need to strengthen the capacity of developing countries to absorb such potential capital flows.

From a financial stability perspective, pension funds represent a truly long-term institutional investor base. However, following the 2000–02 market downturn and low interest rate environment, which many analysts have called a "perfect storm" for pensions, we observe a significant effort by sponsors to lower the risk profile of their pension funds and to shift a variety of risks to pension beneficiaries (i.e., the household sector). It seems increasingly clear that households and individuals can be expected to have a greater responsibility for securing their retirement, deciding how much to save, where and how to invest, and to increasingly bear other risks related to their pensions and retirement. This risk transfer raises the question of how well equipped households are to bear such risks, as well as the appropriate sharing of risks between the household and other sectors. These questions will be addressed further in the March 2005 *Global Financial Stability Report* chapter on the fund management industry and the household sector in general.

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