

**Institutional Investors and Asset Allocations:
Accounting and Regulation of Private Defined Benefit Pension Plans
and Other Institutional Investors in the United States, México, and Australia**

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by

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I. Executive Summary

This note reviews recent changes in financial sector regulation and reforms of accounting rules in the United States, Australia, and Mexico, with an eye toward assessing the likely impact of these changes on the asset allocation decisions of institutional investors. The three countries we study offer perspectives both on how reform is progressing outside of Europe and how institutional investment patterns are changing as a result. The exercise highlights differences across countries, but it also identifies some common themes.

Most notable among the common themes is the reform of the pension sector. In particular, reforms of the regulations and accounting rules for defined benefit pension plans are either in place or looming in many countries. In addition, many countries have enacted legislation facilitating the creation or operation of defined contribution plans.

We anticipate that the reforms aimed at the defined benefit sector will induce defined benefit plans to shift from equity to bonds and assets with more predictable returns, as volatility in plan results will be more costly and stricter adherence to asset-liability management more attractive. Moreover, stricter adherence to asset-liability management may boost demand for long-term bonds.

However, while defined benefit plans will have clear incentives to shift toward bonds after the reforms, the effect of the reforms on the overall allocation of retirement savings is less clear. In particular, most expect the reforms to accelerate the ongoing shift from defined benefit to defined contribution pensions, which tend to feature even higher allocations to equity. In the United States, this shift has parallels in the mutual fund and life insurance sectors, where savings dollars have also increasingly flowed to equity. Thus, it is possible that the ultimate effect of defined benefit reforms will be a greater fraction of institutional assets in equity, if these reforms accelerate the ongoing exodus of corporations from defined benefit plan sponsorship.

It is also important to stress the differences across countries, as the nature of (and impact associated with) reform is expected to vary significantly across countries. For example, in Australia, the defined contribution pension is by far the dominant form of private pension plan; in the U.S. and Canada, transitions to defined contribution are in progress but are by no means complete; in developing countries, the pension sector is

typically nascent with some countries, such as Mexico, reforming their mandatory pension system from a pay-as-you-go defined benefit scheme to a defined contribution system. Hence, reforms relating to defined benefit plan accounting are likely to have a more substantial and immediate impact in the U.S. and Canada than in Australia or in developing countries. In short, even as accounting rules and sector regulations converge, particular conditions in each country---including differences in starting conditions and in local institutions and savings behavior---will weigh heavily on the near-term and long-term effects of reform on asset allocations.

II. United States

In the United States, reforms of regulations and accounting rules are expected to affect the pension sector directly. Accordingly, we start with a review of the private pension system in the U.S. and its likely response to the pending reforms. We then provide background on and discuss recent developments in the life insurance and mutual fund sectors.

In all three sectors, there has been a noticeable shift in asset allocation from bonds to equities over the past several decades. While there are various reasons for the shifts, some particular to each sector, the bottom line is that a much larger share of institutional savings is being dedicated to equities than in the past.

We expect the pending reforms to have mixed effects on this longer-term trend: While the reforms will undoubtedly pressure some defined benefit sponsors to adopt more conservative asset allocation strategies, the reforms are also expected to accelerate the transition from defined benefit to defined contribution, and the latter schemes have historically involved higher allocations toward equity than their defined benefit counterparts.

II.A. Private Defined Benefit (DB) Pension Plans and the Pension Benefit Guaranty Corporation (PBGC)

1. Background: Financial Status of Private DB Pension Plans in the United States and the PBGC

a. Overview

The pronounced slump in equity prices from 2000 through 2003 led defined benefit (DB) pension funds sponsored by private companies and state and local governments to fall from an aggregate overfunded position – that is, with reported assets exceeding pension liabilities – to an underfunded position. And, despite a partial recovery in U.S. equity prices over the past two years, estimates suggest that the *net* shortfall of aggregate DB pension assets to liabilities has remained near 10 percent, just a little better than at its worst point at the end of 2003.¹ In addition, in recent years, a number of large firms have terminated their DB plans, some of them through bankruptcy proceedings and with substantial shortfalls in pension funding. Thus, the Pension Benefit Guaranty Corporation – the government corporation that insures the DB pension benefits for workers in the case of private-sector plan failures – has seen its funding status drop to a significantly negative net position. Moreover, the pension funds for state and local government employees and retirees have also been significantly underfunded, in the aggregate, for the past several years. Although pension fund finances have generally been sufficient to cover benefit payments to retirees, the long-run solvency of a significant fraction of DB plans and of the PBGC would seem to require employers to raise their contribution levels and insurance premiums. As discussed later in the paper, the Financial Accounting Standards Board is considering changes to accounting rules that would likely stimulate tighter DB pension funding by private-sector companies, and the Presidential Administration and the Congress are working on regulatory and statutory changes that would also shore up the private DB system in the United States.

b. Net Funding Position of Private DB Pension Plans in the United States

In the aggregate, private DB pension assets surged with the stock market in the latter 1990s, and at their peak at the end of 1999, pension assets exceeded liabilities by around \$400 billion, or 25 percent. With the subsequent slump in equity prices, pension assets fell sharply while liabilities expanded at a moderate pace, and by the end of 2003, pension assets were short of liabilities by almost \$300 billion, or 17 percent. On net, equity prices rose smartly in 2004 and 2005, and estimates based on incomplete data

¹ This comparison of *net* aggregate underfunding simply subtracts aggregate estimated DB pension liabilities from aggregate assets – that is, in this calculation, one plan’s overfunding helps to offset another plan’s underfunding.

suggest that by the end of last year pension assets were short of liabilities by \$200 billion, or 10 percent. It is estimated that the sum of the shortfall in assets-to-liabilities across large firms with underfunded DB plans – the aggregate funding “gap” – was on the order of \$225 billion at the end of 2005, an appreciable amount, but notably smaller than had been the case a couple of years earlier.²

A somewhat more-detailed analysis can be performed using a sample of annual financial reports covering fiscal year 2004 (the latest available in time for this paper) for DB sponsors among the Fortune 1000 set of firms.³ This sample exhibits considerable heterogeneity in funding ratios: sizable minorities of firms report funding ratios below 60 percent and above 105 percent. That said, 84 percent of large firms sponsoring DB plans reported assets that fell at least a little short of pension liabilities at the end of 2004, and the median funding ratio for large sponsors was 82 percent at that time. Like the aggregate funding ratio and the aggregate funding “gap”, these statistics indicate a noticeable improvement in the gap between private-sector DB pension assets and liabilities compared with 2002 and 2003.

Most sponsors in the sample made cash contributions to their DB plans in 2004, but the contributions typically fell far short of the full amount of underfunding. On average, contributions at underfunded plans in the sample covered about one-third of the beginning-of-period shortfall, about the same as in the previous year. The median contribution-to-underfunding rate was just above one-fifth; and, after accounting for the additional pension costs booked in 2004, the contribution rate represented less than one-tenth of the shortfall for the typical large DB sponsor.

² This measure of aggregate underfunding adds the difference between DB pension assets and liabilities across just the plans with liabilities in excess of assets.

In its “Performance and Accountability Report” for fiscal year 2005, the Pension Benefit Guaranty Corporation includes an estimate of more than \$450 billion for the “total shortfall (of assets to liabilities) in all insured pension plans” as of September 2005. An important reason that the PBGC estimate is so large is that, in effect, they apply a much lower discount rate (than do sponsoring firms in their financial reports) when converting the stream of future benefit payments to a present value measure of liabilities.

A comprehensive source for understanding differences in the financial reports of companies and the PBGC – as well as a number of other important issues for the DB system in the United States is “Reforming the Defined-Benefit Pension System in the United States,” by David W. Wilcox, forthcoming in *Brookings Papers on Economic Activity*, presented at the Brookings Institution in April 2006.

³ The sample analyzed for this paper includes 570 large firms that sponsored DB plans in 2004, which together account for about \$1.2 trillion of DB assets and about \$1.3 trillion of projected benefit obligations (our measure of pension liabilities, here). Thus, the sample covers firms that account for roughly two-thirds of all private-sector DB assets and liabilities.

Thinking more about the distribution of DB underfunding across large sponsoring firms in the sample, the data indicate that a large majority of underfunding in 2004 was in firms with strong credit ratings: 75 percent of the aggregate funding gap that year (the dollar-shortfall of DB assets to liabilities) could be traced to plans sponsored by firms with investment-grade debt. Presumably, most of the firms in this group can make up their pension underfunding in time and, thus, present little default risk to workers and the PBGC. It follows that 25 percent of the underfunding at large sponsoring firms estimated at the end of 2004 – amounting to about \$35 billion – was in firms with speculative-grade debt. Taking a more detailed look at the financial statements, nearly half of the underfunding at speculative-grade firms in 2004 was in four airlines whose plans failed in 2005 and whose plans have been transferred to the PBGC (or will be quite soon).

The sample of large DB sponsors also can be used to address how much the funding position of firms with higher bankruptcy risk improved in 2004 – a development that would have lowered the default risk facing workers and the PBGC. For a given sponsor, a summary measure of the default risk for its DB plan is the product of the firm’s expected probability of default and its pension funding gap. Taking the expected probability of firm default rates from Moody’s KMV and aggregating across all sponsors in our sample with underfunded DB plans and speculative-grade debt, the expected claims for the PBGC over the coming year was estimated to be \$2.2 billion in 2004, a decrease from \$2.8 billion in 2003. These estimates are relatively small because the large majority of sponsors are not perceived to have a high risk of declaring bankruptcy in the next year. The decline in the estimate in 2004 owes to both a drop in default risk and a general improvement in pension funding across the sample.

c. Financial Condition of the Pension Benefit Guaranty Corporation

When firms with underfunded pensions fail, the PBGC assumes the plan assets and the responsibility for paying accrued benefits to current retirees and to workers once they reach retirement age. The plans are frozen so that workers cannot earn additional benefits, and some workers and retirees covered by the plan can see their benefits cut, according to the PBGC’s rules – participants with high benefit payments (above the PBGC’s cap) or who retired “early” (before 60 years of age, generally) are most at risk to

lose a portion of their accrued benefits. The PBGC, which is financed through premiums levied on private DB plans, as well as by inherited assets and their associated investment returns, has seen its financial position deteriorate substantially over the past few years.

The net position of the PBGC – measured as its assets minus its liabilities – rose to positive \$10 billion with the run-up in equity prices in the latter 1990s, but then turned sharply negative as stock prices dropped and a wave of large plan failures began. At the end of fiscal 2005, the PBGC’s net position was negative \$23 billion, as the government corporation reported total assets of \$56.5 billion against total liabilities of \$79.2 billion.⁴ And, despite an increase in equity prices over the year, the PBGC’s net position showed no improvement in fiscal 2005, as an increase in liabilities on the agency’s books about matched its rise in assets. According to its annual report: “During 2005, the PBGC terminated 120 plans in the single-employer program representing a total of \$10.5 billion in assets and \$21.2 billion of future benefit liabilities; . . . the plans terminated last year, had an average funding ratio around 50 percent.”

In recent years, an increase in premium revenue – to \$1.5 billion in 2004 and 2005 from less than \$1 billion in prior years – has provided some support to the PBGC’s condition. PBGC premiums comprise two streams of payments – revenues from a flat-rate premium of \$19 per participant in covered DB plans, which has naturally held rather steady in recent years, and a variable-rate premium that increases PBGC revenues when the amount of underfunding in the private DB system expands. Indeed, in 2004 and 2005, variable-rate premiums accounted for about half of PBGC’s total revenues.

Despite that increase, however, PBGC’s premium structure appeared insufficient to fund its operations over the long term. Indeed, a recent study by the Congressional Budget Office calculated the amount a private insurance company would likely charge the PBGC today to assume its current and future liabilities, net of premium revenue and inherited assets. Their estimate was about \$85 billion to assume net liabilities over the next 10 years and just over \$140 billion for the next 20 years.

⁴ This subsection reports on results for PBGC’s single-employer program, by far the largest portion of its balance sheet and income statement. The PBGC also insures DB plans under its multi-employer program – these plans generally cover workers belonging to local trade unions. The net position of PBGC’s multi-employer program was negative \$335 million at the end of fiscal-2005, reflecting total assets of \$1.16 billion and total liabilities of \$1.495 billion.

As will be discussed below, proposals for higher PBGC premiums – that would also be targeted to DB plans at greater risk of default – have been included in the past two Administration Budgets. The Deficit Reduction Act passed by Congress in early 2006 moved in this direction by increasing the flat-rate premium paid to the PBGC from \$19 to \$30 per plan participant, and indexing future premium changes to wage growth. Unlike the Administration’s proposal, the act did not link variable-rate premiums to firm default risk. However, the Act added a termination premium of \$3,750 per participant, payable over three years by firms that emerge from bankruptcy protection after transferring an underfunded pension plan to the PBGC. In the case of United Airlines, it was estimated that this new premium might have let the PBGC recoup about \$500 million, not a negligible fraction of this firm’s claim of about \$6 billion.

Also discussed below, the current problems with pension underfunding have led to a push for broader reforms. Major pension reform bills passed both the House and the Senate in early 2006 and are currently waiting for differences to be ironed out in conference. These bills would impose significantly stricter funding targets based on sponsor-risk, change the calculation of assets and liabilities to better reflect the economic circumstances of pension balances, limit benefit accruals in underfunded plans, and increase disclosure of plan funding and other parameters. On the accounting side, the Financial Accounting Standards Board (FASB) has proposed fair market valuation of pension fund assets and liabilities on corporate balance sheets – currently, the information is relegated to technical footnotes – and would later revisit the treatment of DB pension funds on the income statement. Taken together, these legislative and accounting reforms could be expected to improve pension funding and transparency, and have the potential to improve the outlook for the PBGC and to reduce some of the risk posed by the government corporation for taxpayers.

d. *Memo*: Net Funding Position of Defined Benefit Pension Plans for State and Local Government Employees and Retirees

The proposed reforms mentioned above would affect only private pension plans and the PBGC. However, nearly as many workers in the United States are covered by state and local government employee pension plans, and such plans hold more assets than do private plans. State and local plans are subject to funding rules that vary greatly across states, and are not subject to the statutes laid out in the Employee Retirement Income Security Act (ERISA) and are not covered by PBGC insurance. Unlike private DB plans, employee contributions make up a significant share of state and local pension funding (about a third of annual contributions since the late 1990s); also, compared with private-sector DB pensions, state and local government employee plans are much more likely to include cost-of-living adjustments for retirees, and tend to offer higher replacement rates at retirement.

Overall, the time-series pattern of aggregate assets and liabilities of state and local government pensions is quite similar to that of private plans. For the system as a whole, assets exceeded liabilities by a rather wide margin in the late 1990s, but the subsequent decline in equity prices led an underfunded position to open up in 2002 and widen in 2003. Estimates based on incomplete data suggest that the rebound in equity prices in recent years helped close a portion of the aggregate funding gap for state and local government pensions, so that at year-end 2005 the funding ratio (assets-to-liabilities) had risen to 89 percent – very close to the ratio for private-section DB plans. At the end of 2005, state and local government pension plans held assets of about \$2.8 trillion and booked liabilities of about \$3.1 trillion.

The emergence of the funding gap over the past several years has led to an increase in plan-contributions by state and local governments, and aggregate contributions by plan participants have inched up as well.

Data for a sample of large pension plans indicates that, despite their recent ramp-up, contributions by state and local governments have continued to represent a small share of general revenues – measuring just 3 percent for the median government sponsor and only 6 percent at the 90th percentile of the sample distribution. This suggests that efforts to keep a damper on aggregate pension underfunding have not, at least so far,

represented a major drain on state and local government resources. For the median plan, the unfunded pension obligations amount to just under 25 percent of annual general revenues of state and local governments; for ten percent of jurisdictions, underfunding represents more than 60 percent of a year's worth of general revenue. Thus, for the median – or typical – plan, pension underfunding is sizable, but could potentially be addressed by diverting a small additional portion of revenues to pension contributions for a period of time. As might be expected given the size distribution of states in the U.S., in dollar terms, the distribution of pension underfunding is far from even: The pension plans of five states alone account for about half of total underfunding in the sector, and relative to liabilities, these states are not necessarily so poorly funded. For example, New York's \$23 billion unfunded pension liability amounts to 13 percent of general revenues and California's \$44 billion unfunded liability is 28 percent. On the other hand, some states, such as Illinois and New Jersey, have large pension funding gaps in absolute terms and in relation to general revenues – near 40 percent in these two cases.

It would seem that although state and local government pension plans certainly remain underfunded by a significant amount, the underfunding does not appear to present a major immediate threat to workers or government finances (finances that, in broad terms, have continued to improve in recent quarters). Reportedly, ratings agencies are monitoring the growth of unfunded state and local pension obligations, but as long as pension contributions do not seem to be putting undue stress on the overall budget, municipal bond ratings are unlikely to be adversely affected.

2. Asset Allocations of DB Pension Plans in the United States and the PBGC

a. Asset allocations of private DB pension plans

As can be seen in table 1, according to current estimates, about 70 percent of assets in private-sector DB pension funds are invested in direct holdings of corporate equity (line 3, which includes private equity and certain hedge funds, as well as traditional equities) or long-term mutual funds (line 4, which includes domestic and foreign equity funds, bond funds, and hybrid funds). And, over the past 20 years, private DB fund managers have increased this share by nearly 30 percentage points; table 1 shows that the shares of each of the other five broad investment categories fell to

accommodate the shift toward equity and mutual funds. As of year-end 2005, around 20 percent of assets were invested in direct holdings of credit market instruments (line 2), a category that includes Treasury securities, corporate and foreign bonds, commercial paper, mortgages, and agency- and GSE-backed mortgage securities; in 1985, this share had been 10 percentage points higher. In 2005, the shares of private DB assets in deposits and money market funds (line 1), guaranteed insurance contracts and variable annuities at life insurance companies (line 5) and various other types of investments (line 6) were all below 5 percent, although each had been above 5 percent 20 years earlier.

It has long been a puzzle in the finance literature why pension funds allocate so much to equity investments. Subsection C below discusses the issues in much greater detail, but two reasons one would expect DB pension managers to prefer to hold bonds are: 1) the income tax code in the United States should bias DB sponsors toward holding fixed-income securities;⁵ and, 2) plan sponsors can more easily hedge interest rate risk on the liability side of the DB balance sheets by holding bonds of a similar duration as their expected benefit payments. Hard data on asset allocations in DB pension plans before the 1980s are not readily available, but sources in the actuarial profession suggest that in the 1960s pension funds regularly contracted with insurance companies to manage their liabilities. Beginning in the late 1960s though, firms reportedly learned that they could lower their reported pension costs by raising their equity allocation and assuming an equity premium while smoothing through volatile returns.⁶ Research suggests that this practice of delayed recognition (and perhaps other aspects of opaque pension accounting) can mislead investors, who thus do not charge firms enough for the extra risk associated with their greater equity allocation. As discussed below, if investors priced firms based on complete and timely information about the pension balance sheet, firms might not allocate such a large fraction of their pension portfolio to corporate equity.

⁵ Subsection C provides more detail, but the argument is that because pension funds are tax-exempt, DB sponsors should hold more heavily taxed assets in their pension fund. In the United States, fixed-income securities are more heavily taxed than corporate equity because equity capital gains are taxed only upon realization, and even then at lower marginal rates.

⁶ More detail about the accounting of pension costs, assets, and liabilities in the United States is contained in section III.A below.

Table 1
Allocation of Assets Held in Private-Sector Defined Benefit
Pension Funds in the United States, 1985 and 2005

Asset category	Share of total assets in:		<u>Difference</u> <i>percentage points</i>
	<u>1985</u> <i>Percent</i>	<u>2005</u> <i>Percent</i>	
1 Deposits and money market mutual funds	7	3	-4
2 Directly-held credit market instruments (primarily Treasury, Agency-backed, and corporate bonds)	32	23	-9
3 Directly-held corporate equity shares	42	59	17
4 Long-term mutual fund shares	1	11	10
5 Guaranteed insurance contracts (GICs) and other insurance contracts	10	4	-6
6 Miscellaneous assets*	8	1	-7

Source. The Flow of Funds Accounts of the United States; table L.118.b of the Federal Reserve Board's Z.1 statistical release. Shares may not sum to 100 percent due to rounding.

* Contributions receivable account for around one-sixth of miscellaneous assets; the remainder comprises alternative investments. However, it should be noted that significant alternative investments classes, including private equity ventures and certain hedge funds, are classified as "corporate equity."

b. Empirical analysis of asset allocations of private DB pension funds

Staff of the Federal Reserve Board (Nellie Liang and Paul Smith, in collaboration with Julia Coronado of Barclays Capital) used data on pension funding, contributions, asset allocations, and credit ratings to study the factors affecting pension funding and contribution rates of sponsoring firms.⁷ Their data on pension finances come from the 2003 and 2004 10-k filings for DB sponsors among the Fortune 1000 firms. New accounting guidance requires that companies disclose the share of pension assets held in various asset classes, supplementing previously required disclosures of the market value of assets and obligations. The pension data are combined with firm-specific measures of the expected probability of default in the year ahead, as estimated by Moody's KMV.

⁷ The analysis discussed in this subsection is closely related to research in "The Influence of PBGC Insurance on Pension Fund Finances," by Julia Coronado and Nellie Liang, Pension Research Council Working Paper 2005-10, July 2005.

The data were also merged with financial information on cash flow, earnings, tax status, and other firm and industry characteristics from Compustat.

A few firms that had terminated their plans or had declared bankruptcy from 2002 to 2004 were excluded from the sample, leaving data for roughly 500 firms in 2004 and about 400 in 2003. Similar to the aggregate data shown in table 1, on average, firms in the sample invested 65 percent of their pension assets in equities, 30 percent in bonds, and the remaining 5 percent was distributed among real estate, cash, private equity, and other investments in both years.⁸ The variation in equity allocations across pension funds is actually quite small – nearly two-thirds of sponsors report between 60 percent and 75 percent of assets in equities. And, the data show similarly little variation in bond shares as well. Pension sponsors did not disclose holdings in more detailed asset-breakdowns, such as domestic, foreign, small-cap stocks, or short- vs. long-term debt, investment- vs. speculative-grade bonds, so the broad figures could mask significant differences in the underlying risk characteristics of DB investments across pension funds.

The new data do permit an exploration of the determinants of funding decisions and asset allocations that could affect the risks faced by share-holders, employees, and/or the PBGC. Here, they address whether sponsoring firms exhibit significant moral hazard behavior in their funding decisions and asset allocations. More specifically, they ask do firms closer to bankruptcy make lower contributions, promise more benefits, or hold riskier portfolios in the DB plans, given the moral hazard induced by mis-priced PBGC premiums? Evidence of moral hazard would indicate greater risks to shareholders, workers, and the PBGC than would probably be the case if accounting disclosures and standards were improved, funding rules were tightened, or PBGC insurance was more appropriately priced.

The empirical approach is to estimate cross-sectional regressions of cash contributions to DB pension plans, funding ratios, and equity allocations on measures of firm bankruptcy risk, cash flow or earnings, tax status, DB plan characteristics, and other

⁸ The flow of funds data shown in table 1 cover a much larger range of DB pension funds. Through 2000, those aggregate estimates are based on sponsors' reports of Form 5500 to the Department of Labor. After 2000, the estimates are based on data for a relatively small sample of large plans.

control variables.⁹ Previous research by the Government Accountability Office has documented a negative relationship between firm risk and cash contributions.¹⁰ The FRB study expands the analysis and examines whether this relationship merely reflects that high-risk firms do not have the financial resources to make cash contributions.

They use several measures of firm risk, including an indicator variable and a continuous variable that flags firms with both high risk and underfunded DB plans, as these are the sponsors that likely place the highest value on the put option implicitly offered by the PBGC. They find that cash contributions and funding ratios are lower at firms with higher bankruptcy risk, even after controlling for firm cash flow and liquid asset holdings, but they find no relationship between bankruptcy risk and the propensity to have raised benefits recently.

When interpreting our results, one should be mindful that most firms are quite unlikely to fail in the near term and many at-risk firms do not have severely underfunded DB plans. Thus, the put option on the PBGC has very low value for most firms and an increase in bankruptcy risk should be expected to have just a small effect on contributions and plan funding. That said, the value of the put option is substantial for high-risk firms with a lot of underfunding: Indeed, estimated regression coefficients indicate that an increase in year-ahead bankruptcy risk from the 95th to the 99th percentile of the distribution of plan sponsors predicts a 7 percentage point decline in the funding ratio. Moreover, a simple calculation (that holds pension obligations constant) suggests that almost half of this lower funding ratio reflects lower cash contributions to the plan in the year in which bankruptcy risk jumps. The remaining difference is accounted for by a combination of lower contributions in previous years and lower investment income.

The FRB analysis does not point to a significant association (holding other factors constant) between a firm's bankruptcy risk and the equity allocation in its pension holdings. Rather, CFOs, pension consultants, and actuaries suggest that equity allocations are more likely driven by current accounting standards (described below),

⁹ The results in this paper are drawn from "The Influence of PBGC Insurance on Pension Fund Finances," by Julia Coronado and J. Nellie Liang, Pension Research Council Working Paper 2005-10, The Wharton School, University of Pennsylvania, April 2005.

¹⁰ "Recent Experiences of Large Defined Benefit Plans Illustrate Weaknesses in Funding Rules," GAO-05-294, May 2005.

which allow firms to write down a higher expected return on assets if they hold a greater share in corporate equity. Still, the high equity allocations could mean greater exposure for the PBGC because of the positive correlation between the likelihood a sponsoring firm will declare bankruptcy and low share prices.

To summarize, our empirical analysis suggests that firms closer to insolvency make smaller cash contributions to their DB pension plans, holding other factors like cash flow and balance sheet liquidity constant. To the extent that this behavior is permitted under current pension funding rules, which grant firms considerable flexibility and time to cover underfunded positions, proposals to tighten funding requirements would seem most promising for reducing the moral hazard problem. Stricter funding standards might also encourage sponsors to reduce their equity allocations since a lower share would generate less asset-volatility and a more predictable stream of cash contributions.

c. Review of arguments against holding corporate equity in DB pension funds

As mentioned above, currently, most private-sector DB plans in the United States hold 60 percent to 75 percent of their assets in corporate equity. It has been noted by economists and professional money managers that accounting rules allow sponsoring firms to “take credit” for an equity premium without acknowledging the greater volatility of stock market returns. The PBGC backstop may give them an additional incentive to hold riskier portfolios. Nonetheless, a number of critics of this practice have argued that the opaque accounting and funding rules should not necessarily justify pension managers holding inefficient portfolios,¹¹ and some have gone as far as to argue against sponsors holding any pension assets in the stock market. This section briefly summarizes several reasons that have been put forth for pension managers to drastically reduce the equity-shares in their portfolios: to reduce balance sheet risk, to improve the hedging of interest

¹¹ In “Did Pension Accounting Contribute to a Stock Market Bubble?” (*Brookings Papers on Economic Activity*, April 2003, pp. 323-59), Julia Lynn Coronado and Steven A. Sharpe (Federal Reserve Board) showed how the accounting of DB pension assets and investment returns seems to have misled investors by substantially boosting net incomes of plan sponsors during the late 1990s.

rate risk, to improve tax efficiency, to lower administrative expenses, and to improve pension funding.¹²

1. Reducing balance sheet risk. The primary economic rationale for investing pension funds in equities is to exploit the equity premium in order to maximize expected return and hence reduce expected future contributions to the plan. However, the higher expected return on stocks is compensation for higher risk; on a risk-adjusted basis the expected returns on alternative portfolios should be equal. The risk from holding equities in the pension funds is obscured by accounting and funding rules, but it has real economic effects. Holding stocks in the pension fund increases the volatility in its financial position in that poor returns can lead to higher required contributions in subsequent periods. As we have seen recently, in the event of a stock market downturn, sponsoring firms are more likely to be required to make substantial new contributions to the fund, perhaps at a time when the sponsor itself is facing difficulties. This claim on corporate assets then feeds pension volatility through to the rest of the corporate balance sheet, affecting debt capacity and, perhaps, earnings volatility.

As a result, a sponsor that moves to an all-bond pension portfolio reduces the overall amount of risk on its balance sheet, which can reduce risk to its shareholders and bondholders. This, in turn, it is argued, increases the sponsor's debt capacity and, hence, its ability to finance operating investments. In effect, moving to an all-bond pension fund re-allocates corporate investment away from investment in other firms and towards investment in the sponsoring firm. This improves efficiency to the extent that a firm is more productive by focusing its time and resources on its core operations, rather than investing in other firms. Similarly, the argument goes, shareholders presumably would

¹² Credit for this summary belongs to Paul Smith of the Federal Reserve Board. In preparing it, he drew upon the following articles: "The Case against Stock in Corporate Pension Funds," by Lawrence Bader, *Pension Section News (Society of Actuaries)*, 2003, pp. 17-19; "The Tax Consequences of Long-Run Pension Policy," by Fischer Black, *Financial Analysts Journal XXXVI*, 1980, pp. 21-28; "Pension Fund Investment Policy," *Financial Analysts Journal XXXVI*, 1980, pp. 21-28; "Pension Fund Investment Policy," by Zvi Bodie, NBER Working Paper No. 2752, October 1988; "Creating Value in Pension Plans (or, Gentlemen Prefer Bonds)," by Jeremy Gold and Nick Hudson, *Journal of Applied Corporate Finance XV*, 2003, pp. 51-57; and, "Pensions and Capital Structure: Why Hold Equities in the Pension Fund?," by John Ralfe, Cliff Speed, and Jon Palin, *North American Actuarial Journal VIII*, 2004, pp. 103-13.

prefer to invest in the sponsoring firm's core operations, rather than a de-facto mutual fund subsidiary (which shareholders can always do on their own).

2. Improving the ability to hedge interest rate risks. Falling interest rates can substantially increase the present value of DB liabilities, worsening the funding position of plans if asset returns and contributions fail to keep pace. Interest rate risk could be hedged, however, if funds held a portfolio of duration-matched, zero-coupon bonds, whose value would increase in tandem with rising liabilities. This strategy would reduce the need for sponsors to make large new contributions or carry unfunded plans after a decline in interest rates.

3. Improving tax efficiency. Because pension funds are tax-exempt and private sponsors generally are not, the most tax-efficient capital structure is to hold higher-taxed assets (i.e., bonds) in the pension fund.¹³ Equity exposure, if desired, can then be increased on the sponsor's balance sheet, e.g., by repurchasing shares. This tax arbitrage was first suggested by Fischer Black (*Financial Analysts Journal*, 1980), who argued that virtually any profitable firm with a DB plan should sell all the stocks in its DB plan and replace them with bonds, while issuing new debt and using the proceeds to repurchase shares. The arbitrage works by exploiting the difference between the after-tax cost of corporate borrowing (reduced due to the deductibility of interest payments) and the after-tax return on debt held in the pension fund (increased due to the tax-exemption of the trust). The change in capital structure on the corporate side is offset by the change in asset allocation on the pension side--i.e., the new bonds in the pension fund support additional borrowing on the corporate side. Holding stocks in the pension fund forgoes this opportunity to maximize tax efficiency.

4. Reducing administrative costs. Finally, eliminating equities from pension funds could reduce administrative costs substantially. According to Form 5500 filings, DB plans

¹³ This is analogous to the idea that individuals should hold bonds in their tax-preferred retirement accounts and stocks outside – see, for example, Gene Amromin, “Precautionary Savings Motives and Tax Efficiency of Household Portfolios: An Empirical Analysis,” Finance and Economics Discussion Series NO. 2005-1, Federal Reserve Board, January 2005.

spent \$3.4 billion in 2000 on investment advice and management fees. Much of this expense comes from hiring professional fund managers who spend a significant amount of resources picking stocks (including “alternative investments,” such as venture capital and private equity). Moving to a bond portfolio greatly reduces the need for these services, in much the same way that passive investing in index funds is generally much cheaper than active stock-picking.

5. Improving pension security. Some of the risk from equities held in pension funds is borne by plan participants and beneficiaries. While the sponsor is required to make contributions to keep the plan funded, a struggling sponsor has the option to declare bankruptcy, terminate the plan, and put the liabilities to the PBGC. This may be an attractive option when plans are severely underfunded and firms are approaching bankruptcy--as can be seen from the PBGC’s recent experience. Participants bear risk in this case because, while the PBGC guarantees accrued benefits, participants in terminated plans forgo any future accruals.¹⁴ The risk of termination would be reduced in firms funding their plans with bonds because sponsors would be less likely to have to make substantial new contributions in an adverse economic environment.

6. Conclusion. Despite the desire to exploit the equity premium and incentives created by opaque accounting and funding rules, a number of economists argue that there would be many advantages to investing DB pension funds entirely in bonds. Until recently, these arguments have had little effect. However, in 2001 the U.K. pharmacy retailer Boots moved all of its \$3.5 billion fund into long-dated duration-matched bonds. They then issued new debt to finance about \$450 million in share repurchases. According to the firm’s former Head of Corporate Finance, this move reduced their 2001 tax liability by over \$150 million and cut their annual management expenses from \$15 million to under \$500,000 (see Ralfe, Speed, and Palin, *North American Actuarial Journal*, 2004). Thus, the firm estimates that in present value, the move increased shareholder value by nearly

¹⁴ In addition, benefit payments by the PBGC are subject to a hard cap.

\$350 million.¹⁵ Boots' big move toward bonds generated enormous publicity in the U.K., and many British and European DB funds are reportedly considering similar moves-- possibly encouraged, in part, by new fair-value accounting standards that went into effect this year in the U.K.

d. *Memo*: Allocation of PBGC assets

PBGC's assets are accounted for in two separate funds – premium revenues are accounted for in *revolving funds*, and “assets from terminated plans and their sponsors are accounted for in the *trust funds*” (emphasis added).¹⁶ By law, PBGC must invest the revolving fund in obligations issued or guaranteed by the federal government; currently, PBGC invests the revolving fund exclusively in Treasury securities. There are no statutory limits on how the trust funds can be invested, and PBGC hires (and closely oversees) private-sector managers to handle those allocations. Considering the revolving funds and the trust funds together (\$55.5 billion), at the end of fiscal 2005, 16 percent of PBGC invested assets were held in cash and cash equivalents, 62 percent were in fixed maturity securities (Treasury securities, agency-backed securities, and bonds), 22 percent were in equity securities, and a negligible portion were in real estate, REITS, and other investments.¹⁷

Compared with the prior year, in 2005, assets in the revolving and trust funds were more heavily invested in fixed maturity securities (62 percent vs. 49 percent), and less heavily invested in cash and cash equivalents (16 percent vs. 21 percent) and equity securities (22 percent vs. 30 percent). This shift in asset allocations is consistent with the new investment policy adopted by the PBGC during 2004 “to better manage the financial

¹⁵ In 2004, the firm announced that it was reversing course somewhat, moving 15 percent of its assets into “other classes,” including equities and property. The stated reason was an inability to match very long-term liabilities with bonds, given that there were “virtually no bonds issued with a maturity beyond 35 years.” The firm's credit rating was downgraded when it simultaneously announced an increase in share repurchases. The new moves were widely criticized in the UK for increasing risk with little reward to pension participants. Nonetheless, most UK pension funds continue to hold portfolios of about 70 percent equity.

¹⁶ The information in this subsection is taken from the “Performance and Accountability Report” of the Pension Benefit Guaranty Corporation, November 15, 2005.

¹⁷ These shares were computed based on data in the *Statements of Financial Condition* (p. 18) of the PBGC's “Performance and Accountability Report,” November 15, 2005.

risks facing the federal insurance program.”¹⁸ PBGC intends to allocate assets in the trust funds to “reduce balance sheet volatility arising from a mismatch between assets and liabilities by (1) continuing to improve its dollar duration match of invested assets to its future benefit liabilities; (2) increasing investments in duration-matched fixed-income securities and (3) decreasing the overall percentage of assets invested in equities to between 15 percent and 25 percent of total invested assets.”¹⁹ According to its most recent “Performance and Accountability Report” (page 15), at the end of fiscal 2005, PBGC’s trustee liabilities were “69 percent matched on a dollar duration basis, meaning that the aggregate interest rate sensitivity of its assets is less than the interest rate sensitivity of its liabilities.”

Recently, economists such as Zvi Bodie and David Wilcox have put forth arguments that would encourage the PBGC to further reduce – eliminate, actually – its duration-mismatch between assets and liabilities.²⁰ Wilcox credits Bodie with having demonstrated that by investing all of its assets in “long-dated zero-coupon bonds structured to mature as the obligations of the terminated pension plans come due,” the PBGC has the ability to fulfill its benefit obligations at minimum cost. What allows for this ability is the fact that all of PBGC’s obligations come from terminated pension plans that, by law, cannot be adjusted for additional increases in service, salary, or inflation.²¹

e. *Memo: Allocation of assets in state and local government pension plans*

As can be seen in table 2, according to the Flow of Funds Accounts of the United States, the allocation of assets in state and local government employee retirement funds has shifted substantially over the past twenty years. As of year-end 2005, 64 percent of

¹⁸ This paragraph draws on the discussion on pages 14 and 15 of PBGC’s “Performance and Accountability Report,” November 15, 2005.

¹⁹ In the *Statements of Financial Condition*, PBGC excludes “cash and cash equivalents” from “total investment assets.” Including those assets in revolving funds and trust funds would imply a somewhat lower target range for PBGC’s equity share – from around 10 percent to about 20 percent.

²⁰ See “Less is Less: Straight Talk about Government Pension Insurance,” by Zvi Bodie, *the Milken Institute Review*, 2005, pp. 38-45; and, “Reforming the Defined-Benefit Pension System in the United States,” by David W. Wilcox (Federal Reserve Board), *Brookings Papers on Economic Activity*, forthcoming (see pp. 32-33 of his April 2006 manuscript).

²¹ PBGC’s obligations are not known for certainty because the longevity of beneficiaries cannot be predicted perfectly. However, in Bodie’s and Wilcox’s view, longevity risk is unlikely to affect the optimal allocation of PBGC assets.

fund assets were invested directly in corporate equity and another 9 percent of assets were held in long-term mutual funds; 25 percent of assets were allocated to a variety of fixed-income securities, and the remaining 2 percent were held in deposits and money market funds. By contrast, in 1985, the major asset allocations were switched, with 63 percent of assets invested in fixed-income securities and only 30 percent in corporate equity; deposits and money market funds accounted for 6 percent of assets in 1985, and just 2 percent were held in long-term mutual funds. As of year-end 2005, the asset allocations of state and local government employee retirement funds (table 2) almost exactly matched those for private-sector DB pension plans (table 1).

Table 2
Allocation of Assets Held in State and Local Government Employee Retirement Funds in the United States, 1985 and 2005

Asset category	Share of total assets in:		<u>Difference</u> <i>percentage points</i>
	<u>1985</u> <i>Percent</i>	<u>2005</u>	
1 Deposits and money market mutual funds	6	2	-4
2 Directly-held credit market instruments (primarily Treasury, Agency-backed, and corporate bonds)	63	25	-38
3 Directly-held corporate equity shares	30	64	34
4 Long-term mutual fund shares	2	9	7

Source. The Flow of Funds Accounts of the United States; table L.118.b of the Federal Reserve Board's Z.1 statistical release. Shares may not sum to 100 percent due to rounding.

3. A Brief History of Regulation and Accounting Rules for Defined Benefit Pension Plans in the United States

a. Regulation of DB plans²²

²² For more details on the history of U.S. pension plan regulation, see McGill, D.M., Brown, K.N., Haley, J.J., and Schieber, S.J. (2005), *Fundamentals of Private Pensions* (8th edition), New York: Oxford University Press. This section borrows heavily from Chapter 4 of that work. Another very good, recent reference is "Reforming the Defined-Benefit Pension System in the United States," by David W. Wilcox (Federal Reserve Board), presented at the Brookings Panel on Economic Activity, April 2006.

Prior to 1974, private pension plans faced little regulation. Amendments to the Internal Revenue Code in 1942, along with some subsequent rulings by the Internal Revenue Service (IRS), did link tax exempt status to a minimum contribution policy and the design of the plan (with the effect of guarding against discrimination in favor of upper management). The Federal Welfare and Pension Plans Disclosure Act of 1958 instituted disclosure requirements aimed at providing plan participants and beneficiaries with information about plan assets and operations.

These statutes did only so much to protect employee interests, and the vulnerability of interests was exposed most memorably with the closing of Studebaker's Indiana automobile plant in 1963. Despite compliance with existing law, the plan was massively underfunded and prioritized the claims of retirees and those eligible for retirement over younger workers: Fully vested employees who were not eligible for retirement received only 15 cents on the dollar. This, together with the release of the Report of the President's Committee on Corporate Pension Funds in 1965, helped to create the momentum for reform that led to the enactment of the Employee Retirement Income Security Act of 1974 (ERISA).

Combined with the tax code, ERISA regulates most activities of DB pension funds in the United States and requires sponsoring firms to maintain legally separate trusts to fund accumulated pension obligations. The trusts, which are tax-exempt, must act solely in the interest of plan participants and beneficiaries for the exclusive purpose of providing benefits. But, while legally separate from the sponsoring firm, the trust has an on-going claim on the firm's assets, through the funding rules, which, as discussed below, generally require firms to make annual contributions to their pension plans. The pension trusts can be viewed essentially as a tax-exempt financial subsidiary of the sponsoring firm.

ERISA was a watershed in the regulation of private defined benefit pension plans. It set minimum standards for plan design, particularly in the areas of vesting and portability, and set new standards for reporting and disclosure. It established the Pension Benefit Guaranty Corporation (PBGC) to insure the pensions of workers in the event of employer failure, subject to certain limits. Employers are required to pay a fixed

premium (per participant per year) to the PBGC, with an additional “variable rate” premium if the plan fails to meet certain funding requirements.

ERISA also established formal federal requirements for pension funding and asset management. A plan is required to fund the annual “cost” of the plan (i.e., the present value of pension benefits accrued during the year) plus gradual amortization of liabilities deriving from experience, changes in actuarial assumptions, plan changes, and other sources. Importantly, amortization schedules also apply to deficits arising from poor asset performance, so companies are not required to immediately offset asset market losses with higher plan contributions. Pension liabilities tend to grow each year, as participants accrue additional benefits and move one year closer to retirement. ERISA and the tax code generally require that annual increases in pension liabilities be offset by new funding “credits.” Credits can take the form of new contributions, amortization of assumptions that improve plan funding, or carry-forwards of prior contributions that may have been made in excess of any required amounts. The latter two concepts give plans significant flexibility to affect required contributions, even when plans are underfunded. Moreover, these concepts can allow even greater flexibility to plans that hold corporate equity. For example, in determining a plan’s funding status, it can use an “actuarial value of assets,” which smooths the market value of assets by amortizing over five years deviations between actual and expected asset-returns. This allows fund managers to take credit for returns associated with the equity premium, while not having to account for the associated volatility of actual stock returns. With regard to carry-forwards of past “excess contributions,” equity investments are also encouraged to the extent that credit balances are allowed to be carried forward at book value (plus interest), regardless of the market value of the assets in the plan portfolio.

Under ERISA, fiduciary requirements were established for the management of plan assets. The basic guideline for asset selection is a “prudent man” standard that avoids specific restrictions or percentage limits, except in the case of securities and real property of the sponsoring company (which is limited to 10 percent of plan assets). As reported above, DB fund managers have tended to invest the majority of plan assets in corporate equity and mutual funds, and the allocation in these asset-classes has generally grown over the past twenty years.

ERISA's requirements have important tax consequences. For a plan to qualify as exempt for federal income tax purposes, it must comply with funding, vesting and other requirements in the statute. Beyond ERISA, subsequent legislation has also weighed heavily on tax incentives regarding plan contributions and funding. In the 1980's, Congress reacted to a wave of plan terminations by enacting reversion taxes (i.e., excise taxes placed on assets withdrawn from an overfunded plan after plan termination) and full funding limits (which eliminate the tax deductibility of plan contributions once the plan has reached a certain funding level).

While the basic framework of ERISA has remained intact, its particulars have been modified by a raft of legislation since 1974. Especially noteworthy were recent acts providing temporary relief from funding requirements. The Job Creation and Worker Assistance Act (2002) and the Economic Growth and Tax Relief Reconciliation Act (2001) had various provisions to ease the strain on corporations with defined benefit plans for the 2002 and 2003 plan years. In particular, the interest rate rules used to evaluate pension liabilities for the purposes of determining minimum funding and PBGC premiums were relaxed. For minimum funding, companies were allowed discount at 120 percent of the 30-year treasury rate (instead of 105 percent); for PBGC premiums, the discount rate was raised to 100 percent of the 30-year treasury rate (instead of 85 percent). However, while the stringency of funding provisions has ebbed and flowed, to some degree with the economic cycle, the current reform debate holds some possibility of a significant shift in the direction of greater stringency in funding rules and penalties for risky behavior.

b. Accounting for the assets and liabilities of DB pension plans in corporate reports²³

The Financial Accounting Standards Board (FASB) issued Statement No. 87 (FAS 87) in 1985, applying to fiscal years starting after December 15, 1986. This statement remains as the foundation of pension plan accounting in the U.S. today,

²³ For more details on the current accounting regime and its evolution, see McGill et al, Chapter 26. Additionally, helpful discussions can be found in: "Did Pension Plan Accounting Contribute to the Stock Market Bubble?" by Julia Lynn Coronado and Steven A. Sharpe, *Brookings Papers on Economic Activity*, April 2003, pp. 323-59; and "Reforming the Defined-Benefit Pension System in the United States," by David W. Wilcox (Federal Reserve Board; April 2006).

although, as section IV.B discusses, FASB is in the process of considering substantive changes to these rules.

Before FAS 87, reported pension costs were often not comparable across sponsoring firms, or, sometimes, even across years for the same firm. FAS 87 created a standard definition of pension cost to be used by all firms on their income statements. While previous measures were often cash-based, the new measure was accrual-based. However, FAS 87 did not change the long-used practice of delayed recognition, under which changes in assets and liabilities could be amortized over several years rather than recognized immediately. Delayed recognition has been a key source of criticism of pension accounting in recent years.

After FAS 87, companies were required to report a measure of pension expense in the income statement. The components of the FAS 87 definition of pension expense, called “net periodic pension cost” (NPPC), are outlined in table 3 below. In the calculation, the cost of benefits earned by employees over the year and the cost of financing the outstanding pension obligations are counterbalanced, to some degree, by the returns claimed on plan assets. However, as mentioned, it is the *expected* return on plan assets – not the *actual return* – that offsets other pension expenses in corporate income. Amortization amounts reflecting gains or losses due to actual plan experience deviating from expectations, gains or losses on prior year liabilities due to changes in assumptions, and other items are added to the pension expense measure to get to NPPC.

Table 3

FAS 87 Accounting of DB Pension Expense

Net periodic pension cost (NPPC) =	
	Present value of pension benefits earned by employees in the past year
+	Annual interest on outstanding pension benefit obligations
+	Amortization of unrecognized gains or losses, changes in accounting assumptions, and changes in plan benefits
-	Expected return on plan assets

As mentioned, the most criticized aspect of the NPPC concept under FAS 87 is the treatment of investment returns because plans that hold corporate equity in their portfolios essentially receive an income credit for the equity premium while concealing the volatility in pension costs induced by the actual returns on those assets. In their *Brookings Paper* (April 2003), Julia Coronado and Steve Sharpe (Federal Reserve Board) demonstrated that as the assets of corporate DB pension plans “ballooned as a result of the booming stock market . . . and this provided a substantial, although stealthy, boost to the profits reported by sponsoring corporations.” Their analysis indicated that during the 1990s boom, the market did not “price” sponsors’ inflated pension earnings any differently than core earnings, leading some companies’ share prices to be distorted significantly.²⁴ A corollary to their main results is that firms sponsoring DB plans probably have successfully reduced their reported pension costs because of opaque accounting rules.

FAS 87 required disclosure of the total outstanding liabilities and assets (at market value). This disclosure has been carried in the footnotes to the financial statements, which also features a reconciliation of the actual status of the plan to the pension assets and liabilities carried on the balance sheets.

4. Prospects for Changes in the Regulation and Accounting of Defined Benefit Pension Plans in the United States

Update on regulatory and accounting reform for DB pension plan in the United States. Since this background paper was prepared, actions have been taken to change how defined benefit pension plans are regulated and accounted for in the United States. As discussed below, generally speaking, the new rules were intended to improve the transparency of DB pension obligations of private plan sponsors to investors, analysts, and regulators, and to improve the funding of private plans and the Pension Benefit Guaranty Corporation (PBGC) – the agency chartered to insure DB benefits. In August 2006, President Bush signed into law the Pension Protection Act of 2006 (the PPA),

²⁴ For the stock market as a whole, however, Coronado and Sharpe estimate a rather small aggregate overvaluation in 2000 that seems to have been associated with pension-related distortions to corporate net income statements.

which included new rules governing the funding and administration of private DB plans. Among other provisions, the PPA closed loopholes that previously allowed some underfunded DB plans to avoid making pension contributions, and it generally tightened mandatory contribution formulas to try to improve plan funding. In addition, under the PPA, significantly underfunded plans are restricted from offering new benefits without paying for them upfront, and terminated (underfunded) pension plans and certain ongoing plans with substantial funding gaps will be required to pay extra premiums to the PBGC.²⁵ In September 2006, FASB issued Statement No. 158 to improve disclosure of pension assets and obligations in the balance sheets of sponsors' reports to the Securities and Exchange Commission (SEC).²⁶ Among the key new provisions in Statement No. 158, for fiscal years ending after December 2006, DB sponsors are required to: a) recognize in the balance sheet an asset for a plan's overfunded status or a liability for a plan's underfunded status; b) measure a plan's assets at fair market value and its liabilities as projected benefit obligations as of the end of the company's fiscal year; and, c) recognize changes in the funded status of a DB plan in the year in which those changes occur – such changes will need to be reported in the company's "comprehensive" income, but will not be accounted for in net income. These new guidelines represent substantial improvements in pension plan disclosures for analysts, shareholders, and regulators. As discussed below, in a second phase of its study on the accounting for postretirement benefits, FASB has stated its intentions to review the accounting methods used by DB sponsors to measure net pension cost as it pertains to net income. However, FASB has still not indicated what accounting rules it might consider best for representing the financial costs of operating a defined benefit pension plan in companies' income statements, and new guidelines along this dimension are likely some years away.

²⁵ For a description, see "The Pension Protection Act (H.R. 4)", House Committee on Education and the Workforce, <http://www.edworkforce.house.gov/issues/109th/workforce/pension/pensionbillsum72806.htm>

²⁶ See "Summary of Statement No. 158: Employers' Accounting for Defined Benefit Pension and Other Postretirement Plans – an amendment to FASB Statements No. 87, 88, 106, and 132(R)," Financial Accounting Standards Board, <http://www.fasb.org/st/summary/stsum158.shtml> .

Congress, the Administration, and the Financial Accounting Standards Board have on their respective agendas to substantively change how DB pension plans in the United States are regulated and accounted for by sponsoring firms. It is, of course, difficult to precisely characterize the final form of legislation yet to be passed or accounting guidance yet to be issued. However, many observers seem to share the perception that the accounting reforms are quite likely to move in the direction of improved transparency for pension obligations and net pension expenses and for marking assets to market value and recognizing actuarial pension liabilities on company balance sheets. Just what accounting rules would best represent the financial costs of operating a defined benefit pension plan in the income statement is less clear, and new guidelines along this dimension are likely some years away.

Moreover, discussions about changes to ERISA share a similar flavor, and might be expected to propose much shorter amortization periods for the recognition of deficits caused by poor investment results and, possibly, greater penalties for plans that remain severely underfunded. Of the two areas of reform, changes in accounting rules are typically fingered by observers to be more important, prospectively, in terms of their likelihood for materially changing how defined benefit pension plans are administered by their company sponsors.

a. Recent and prospective changes in pension accounting rules

In March 2003, the Financial Accounting Standards Board initiated a limited-scope project to improve pension-related disclosures in footnotes to company financial reports, and a set of new disclosures were approved in December of that year. The following new or expanded disclosures were included for company *annual* reports:^{27,28}

²⁷ This paragraph and the next draw upon a succinct summary in “Defining Issues: New Retirement-Plan Disclosures for 2003 Reports,” by KPMG LLP, No. 03-29, December 2003, http://www.us.kpmg.com/RutUS_prod/Documents/12/DI%2003_29.pdf, accessed on 6/9/06.

²⁸ An example of a recent study that has used the new pension disclosures in company annual reports is “The Influence of PBGC Insurance on Pension Fund Finances,” by Julia Coronado and Nellie Liang, Pension Research Council Working Paper 2005-10, July 2005.

- The percentage allocations of the fair value of total pension assets in each major investment category (e.g., corporate equity, debt securities, real estate, and other assets), and target allocations, as well as a description of investment policies and strategies
- The basis used to determine the assumed overall rate of return on plan assets
- The pension benefits expected to be paid by the company in each of the next five years and in the subsequent five-year period. And, the accumulated pension benefit obligation for all DB plans.

In addition, the following new disclosures were added for company *interim* reports:

- The amount of net periodic benefit cost recognized by the company, including a table showing the major components separately – such as, service cost, interest cost, the expected return on assets, amortized obligations or asset values, and recognized gains or losses on assets.
- Any contributions the company paid in the interim period or expects to pay in the current fiscal year if expected payments changed significantly from the amounts disclosed previously.

Late in 2005, FASB announced a project to “comprehensively reconsider guidance in its earlier Statements No. 87 ... No. 106 ... and No. 132 ...”, meaning that new guidelines would likely change how pension assets and liabilities are accounted for in company financial reports.²⁹ FASB’s initiative will proceed in two distinct phases. In the first phase, FASB will revisit balance sheet accounting, and consider moving the information on plan status currently disclosed in the footnotes directly onto the balance sheet. Currently (as of June 2006), FASB is reviewing public comments on an exposure draft for phase-I revisions to accounting guidelines, and, after considering the public’s

²⁹ http://www.fasb.org/project/postretirement_benefits.shtml, accessed on May 31, 2006. FASB’s exposure draft on “Employers’ Accounting for Defined Benefit Pension and Other Postretirement Plans” (March 31, 2006) can be downloaded from http://www.fasb.org/draft/ed_pension&postretirement_plans.pdf.

views, new rules are expected to be issued by FASB by year-end 2006. In phase II, FASB will reconsider guidance relating to the calculation of pension obligations and how best to reflect pension costs in measurements of income and profits. There seems to be much less consensus about the most appropriate way to represent net pension costs on company income statements, and the phase-II study is expected to take some time to complete.

As was noted above, FASB's 2005 announcement came amid significant aggregate underfunding in private DB plans and following a few years that have seen a number of large, underfunded plans being terminated. In that light, it would be surprising if the changes in accounting guidelines failed to materially improve the transparency of pension funding and costs, and many observers expect them to, on net, raise sponsoring firms' reported pension expense and motivate them to adopt closer asset-liability matching strategies and shift their portfolios from corporate equity holdings to fixed income securities.

FASB's March 2006 exposure draft lists the major elements of the phase I accounting reforms as follows:³⁰

1. Recognize in its statement of financial position the overfunded or underfunded status of a defined benefit postretirement plan measured as the difference between the fair value of plan assets and the benefit obligations. For a pension plan, the benefit obligation would be the projected benefit obligation; for any other postretirement benefit plan, such as a retiree health care plan, the benefit obligation would be the accumulated postretirement benefit obligation.
2. Recognize as a component of other comprehensive income, net of tax, the actuarial gains and losses and the prior service costs and credits that arise during the period but pursuant to FASB Statements No. 87, *Employers' Accounting for Pensions*, and No. 106, *Employers' Accounting for Postretirement Benefits Other Than Pensions*, are not recognized as components of net periodic benefit cost. Amounts

³⁰ This list is taken verbatim from page i of the exposure draft posted at http://www.fasb.org/draft/ed_pension&postretirement_plans.pdf. The exposure draft also notes that FASB proposes that sponsors would be required to measure plan assets and liabilities as of the same date as other balance sheet items, but this requirement will not take effect until fiscal years beginning after December 15, 2006.

recognized in accumulated other comprehensive income would be adjusted as they are subsequently recognized as components of net periodic benefit cost pursuant to the recognition and amortization provisions of Statements 87 and 106.

3. Recognize as an adjustment to the opening balance of retained earnings, net of tax, any transition asset or transition obligation remaining from the initial application of Statement 87 or 106. Those amounts would not be subsequently amortized as a component of net periodic benefit cost.
4. Measure defined benefit plan assets and defined benefit plan obligations as of the date of the employer's statement of financial position.
5. Disclose additional information in the notes to financial statements about certain effects on net periodic benefit cost in the upcoming fiscal year that arise from delayed recognition of the actuarial gains and losses and the prior service costs and credits.

Thus, the phase I proposal would remove aspects of current accounting standards that allow delayed recognition for certain changes in plan assets and obligations (discussed above) on balance sheets in company reports, but would not materially change net pension benefit cost formulas for deriving net income on the profit or loss statement. According to FASB's exposure draft, the primary motivation for this change in accounting would be to "increase the transparency and completeness of financial statements for shareholders, creditors, employees, retirees, and other users."

FASB has not circulated much information about specific changes that could be considered for the more substantive, second phase of their pension-accounting initiative. The exposure draft from the first phase states "A second, broader phase will comprehensively address remaining issues. The Board expects to collaborate with the International Accounting Standards Board on that phase." Indeed, FASB and IASB have "publicly acknowledged their commitment to develop compatible standards for application in both domestic and cross-border accounting for financial reporting."³¹ And,

³¹ See "A Roadmap for Convergence between IFRSs and US GAAP – 2006-2008: Memorandum of Understanding between the FASB and the IASB," February 27, 2006, <http://www.fasb.org>.

both standard-setters have on their agendas to further study the accounting of postretirement benefits, including defined benefit pension plans.

b. *Memo*: Pension accounting in the United Kingdom

Standards for pension accounting in the United Kingdom had been based on the same actuarial principles as FAS 87. In November 2000, the U.K.'s Accounting Standards Board (ASB) issued revised Financial Reporting Standard 17 (FRS 17), which called for marking to market pension assets and liabilities on corporate balance sheets, although it continued to allow a smoothed measure of net pension cost on the income statement. At that time, FRS 17 was to have been phased into practice beginning in 2001. However, a number of companies lobbied against the new standard. At the time, pension funds were still receiving a boost to net income from the higher-than-expected returns on their pension assets associated with the stock market boom of the late 1990s. Some pension regulators in the U.S. were concerned that sponsoring firms might react to the new accounting guidelines by terminating their DB plans – a response that was fairly easy because of the generally lofty funding ratios.

The revised FRS 17 finally became mandatory for U.K. companies on January 1, 2005; its main features include:³²

1. Pension assets are to be measured at market values.
2. Pension liabilities are to be measured as the stream of future benefit payments discounted using the yield on an AA-rated corporate bond of approximately average equivalent term.
3. Pension surpluses and deficits are to be fully recognized on the sponsor's balance sheet.
4. Movements into pension surpluses and deficits are to be decomposed into i) current service costs and any past service costs, recognized in operating profits; ii) interest costs and expected return on assets, recognized as other finance costs; and

³² The information in this paragraph was taken from a memo written by Peter Brierley of the Bank of England, entitled "Pension Fund Asset Allocation and Liability Management in the U.K.: Accounting and Regulatory Influences," March 2006.

iii) actuarial gains and losses, recognized in full and immediately, rather than smoothed or amortized over time.

U.K.'s ASB has been known as a leading proponent of fair value accounting, and FRS 17 was widely viewed as an important step in improving the representation of defined benefit pension positions in sponsors' financial reports. However, it should be noted that, to date, the ASB's new pension accounting guidelines have focused on changes to company balance sheets, but have not fundamentally altered accounting on income statements.

c. Possible legislation affecting the regulation of DB plans in the U.S.

For a few years, the Administration has had on its agenda to substantially modify the elements of ERISA and the income tax code to affect how defined benefit pension plans are operated in the United States. Early in 2005, the Administration put forward a pension reform proposal, which included three key features:³³

1. Pension funding targets would be based on mark-to-market measures of DB benefits and liabilities; in calculating liabilities, discount rates would be gauged to duration using a yield curve for high-quality corporate bonds that the Treasury would publish.
2. All sources of underfunding would be amortized over seven years.
3. Sponsors would be allowed a “cushion-level” of overfunding when calculating their maximum tax-deductible pension contributions.

Early in 2006, both Houses of the U.S. Congress passed their own versions of new legislation, which included significant changes to current law, but did not go so far as the Administration’s proposal. As of early summer 2006, the House and Senate versions have not been reconciled; given the significant differences in some provisions of the two versions, and the other legislative items on the Congressional docket, it is unclear when a final bill might be prepared. That said, based on Assistant Secretary Warshawsky’s comments and press reports, it seems likely that regulatory reforms will include, to some extent, accelerated amortization of pension funding deficits, freezes on further benefit accruals at plans that are severely underfunded, and a transition to using yields on high-grade corporate bonds to discount pension benefits in calculating plan liabilities.

In addition, the enactment of the Deficit Reduction Act of 2005 – which was signed into law by the President in February 2006 – included some changes to parameters affecting the administration of DB plans: The flat-rate premium plan sponsors are obligated to pay to the PBGC was increased from \$19 to \$30 per participant and annual

³³ This paragraph draws heavily upon “Reforms to U.S. Pension Funding and Accounting Rules: Their Potential Effect on Equity Values and Interest Rates,” comments by Mark J. Warshawsky, Assistant Secretary of the U.S. Department of the Treasury, to the European Institute’s Sovereign Funds Roundtable, London, England, May 17, 2006; <http://www.treasury.gov/press/releases/js4266.htm> .

premiums will now be indexed to inflation. This law also included a new “termination premium” of up to \$3,750 per participant (that is, \$1,250 per year for three years) for plans that are terminated by firms as part of their bankruptcy-reorganization process, then subsequently emerge from bankruptcy. This new legislation seems to have been intended to provide some additional funding for the PBGC, but without moving to tighten plans’ funding status more forcefully, it was probably not designed to directly address some of the more long-term issues facing the system.

d. An assessment of the possible response to regulatory and accounting changes by sponsors of DB pension plans

As was noted above, it is far too early to confidently predict how many and what types of substantive regulatory and accounting reforms for defined benefit pension plans will be adopted in the United States. Still, in light of the move toward fair value accounting in the U.K. and Europe, and the call for accelerated amortization of plan deficits and improved, more-complete disclosures in the U.S., many observers have come to expect significant further changes in those directions. To consider the ways in which plan sponsors might be expected to respond, this subsection discusses: 1) how employers have responded in other countries facing similar reforms, 2) how reforms are likely to affect incentives facing employers in the context of the system currently in place in the U.S., 3) how reforms are likely to affect trends already at work in the U.S., and 4) results from a small survey of market participants.

Perhaps, the most likely effect of tougher regulation and tighter accounting rules could be to accelerate the shift of employers from defined benefit pension plans to defined contribution plans. In the United States, such a shift has been underway for at least a few decades already and that shift has been documented and described thoroughly in another background paper for the CGFS Working Group. There is some evidence that increased regulation of defined benefit plans contributed to the shift from DB to DC pension coverage, but that background paper also cites a number of other important factors.³⁴ Currently, there seems to be a consensus among market observers and

³⁴ See Aaronson, S., and Coronado, J.L. (2005), “Are Firms or Workers Behind the Shift Away from DB Pension Plans?” *Finance and Economics Discussion Series 2005-17*, Federal Reserve Board.

participants, prospectively, that tougher regulations will add to the pressures that have been leading the shift toward defined contribution plans.

A second effect concerns the asset allocation decision within defined benefit pension funds. Several aspects of the prospective regulatory and accounting reforms would appear to provide incentives for DB sponsors to shift the asset allocations away from equity holdings, toward fixed-income securities. First, future ERISA funding rules seem likely to be less forgiving with respect to volatility in pension fund performance to the extent that sponsors will be required to make up deficits more quickly (accelerated amortization relative to current law) and will face stronger penalties if their plans are in an underfunded position, so the costs of bearing equity risk in the short term are poised to rise. Second, if future income statements and balance sheets reflect marking of assets to market, pension fund equity holdings will introduce unwelcome volatility into company's financial reports. The current "smoothing" approach to reflecting pension asset returns in reported net income requires an "expected rate of return" on the company's pension assets: Since this expected rate is not adjusted for risk, companies selecting a higher allocation to equity are justified in selecting a higher rate of return and, consequently, can report higher net income. If this smoothing mechanism is removed, the corresponding incentives to use pension fund equity allocations to boost reported earnings will be weakened.

But, will accounting changes really lead to significant shifts in the allocations of DB assets? Recent evidence³⁵ suggests that investors do indeed fail to "see through" pension plan accounting rules and in fact tend to overvalue earnings due to pension fund returns. Thus, companies have historically enjoyed favorable stock market valuations derived from taking risks with their pension assets, so it is plausible that greater transparency will create incentives for more conservative investment policies.

Some analysts have begun to look to the U.K. as a guide for what will happen in the U.S. In the U.K., tougher funding rules adopted with the Pensions Act of 1995, followed by mark-to-market accounting rules in FRS 17, have been accompanied by widespread closure of defined benefit schemes and a movement from equity investments

³⁵ Coronado, J.L., and Sharpe, S.A. (2003), "Did Pension Plan Accounting Contribute to a Stock Market Bubble?" *Brooking Papers on Economic Activity*, Issue 1, pp. 323-59.

toward fixed-income securities over the past decade. Some features of the U.K. system, such as the mandatory indexing of benefits, have bred greater demand for (index-linked) bonds than is anticipated in the U.S. Nevertheless, some view the U.K. experience as a preview of the likely outcome in the U.S.

On the other hand, there is little evidence thus far that adoption of ALM strategies – “asset-liability management,” the term for matching cash flows on both sides of the balance sheet – has pushed U.S. pension funds toward fixed income. As indicated above, statistics from the Flow of Funds Accounts of the United States show that private defined benefit plans have, on net, *lowered* their allocations to credit market instruments, from 31 percent in 1995 to 23 percent in 2005. In addition, the annual survey of large pension funds conducted by *Pensions and Investments* (P&I) has shown little change in the basic equity/bond split of fund assets between 1995 and 2005.

Why has there been so little movement? In addition to the incentives embedded in current accounting rules and ERISA funding regulations, interviews with market participants indicate that some view equity as a valuable hedge against wage inflation. Moreover, our interviews revealed that some sponsors are unwilling to “lock in” deficits by investing in long-term bonds with low yields. Desire for high returns and a better match between assets and liabilities has led to a growth of interest in alternative strategies.

In particular, the P&I survey shows growth in “alternative investments” such as hedge funds and private equity. Market observers and interviewees indicate that these vehicles are viewed by some as a means of earning high returns uncorrelated with other traditional asset classes, and also as means of extending duration of the asset portfolio (presumably to offer a closer match to the term structure of liabilities) in the current low-yield fixed income environment. Similar thinking has motivated greater investment in infrastructure and real estate. Use of derivatives has also increased, although some of this may be linked to ALM strategies based on swaps and swaptions rather than any search for yield. Funds have also shifted toward a heavier weighting on foreign equities, mirroring a similar shift reported among DB pension funds in the U.K.

The recent growth in alternative investments may derive from the interaction of the growing interest in ALM with the incentives embedded in FAS 87 that encourage

companies to invest in asset classes with high expected returns. Thus, if accounting rules were changed, it is conceivable that implementation of ALM by U.S. pension funds could migrate toward immunization strategies with heavier reliance on bonds.

The majority view, based on both public assessments of observers and private interviews with market participants, seems to be that regulatory and accounting reforms will induce DB pension funds to shift their allocations from equity investments toward fixed-income securities, but that the shift will be neither dramatic nor sudden. It should be noted, however, that opinions vary. For example, a recent survey by the Committee on Investment of Employee Benefit Assets (CIEBA, a lobbying group composed of large pension plan sponsors) indicated that about 30 percent of respondents would reduce equity allocations by more than 10 percent if the proposed legislative and accounting reforms were adopted, with most indicating that the allocation change would occur within 3 years or less. On the other hand, other observers anticipate only small and gradual changes. Moreover, there is little hint of any anticipatory movement toward fixed income in the current data, and our interviews reveal little evidence of pension funds having plans for such allocation changes in the near future.

Of course, it is difficult to gauge with a high degree of confidence just how a plausibly-sized portfolio shift might affect major asset prices. That said, in his recent remarks to the European Institute's Sovereign Funds Roundtable (see the reference in footnote 29), Treasury Assistant Secretary Warshawsky included some discussion of this issue. He interpreted the CIEBA survey evidence as indicating that one might expect something like \$360 billion of DB assets to be shifted from equity investments to fixed-income securities. And, he noted that as sizable as this flow might be, it constitutes only about 2 percent of the market value of U.S. corporate equity and a similar share of Treasury, agency-backed, and corporate and foreign bonds in the United States. To the extent that DB portfolios would be rebalanced over the course of a couple of years, rather than in a short window, it seems unlikely that a shift in asset allocations of this magnitude would have appreciable, long-lasting effects on equity prices or market interest rates. In his recent remarks, Assistant Secretary Warshawsky compared a pension-related rebalancing of this size with econometric estimates regarding the effect of U.S. federal government deficits on Treasury yields and with the Treasury's experience upon

announcing (in the late 1990s) that the 30-year bond would no longer be issued. Naturally, the DB-case might produce a different result, but Assistant Secretary Warshawsky suggested that a shift toward fixed-income securities by pension fund managers of the expected size could lower bond yields by 10 basis points to 15 basis points during the adjustment period.

II.B. Life Insurance Companies and Mutual Funds

1. Life Insurance Companies in the United States

According to *Flow of Funds* statistics shown in table L-1 below, U.S. life insurance company equity holdings increased dramatically in the 1990's. The fraction of life insurance industry assets allocated to equities spent most of the 1970's and 1980's in the 5 percent to 10 percent range. By 2000, the figure had skyrocketed to 30 percent. This figure eased a bit over the next few years, but remained high in historical context at 26 percent by the end of 2005.

Year	Cash	Credit Market Instruments	Equity	Mutual Funds	Misc
1945	1.82%	93.85%	2.28%	0.00%	2.28%
1950	1.60%	92.49%	3.35%	0.00%	2.56%
1955	1.48%	91.58%	4.10%	0.00%	2.84%
1960	1.12%	91.19%	4.32%	0.00%	3.37%
1965	0.97%	89.36%	5.84%	0.06%	3.70%
1970	0.90%	86.91%	7.27%	0.40%	4.58%
1975	0.68%	83.88%	9.83%	0.21%	5.36%
1980	1.10%	82.96%	9.97%	0.24%	5.73%
1985	1.78%	81.22%	9.30%	0.44%	7.26%
1990	1.70%	83.95%	6.06%	2.27%	6.02%
1995	1.37%	77.95%	15.20%	1.64%	5.16%
2000	4.70%	61.99%	28.44%	3.09%	1.77%
2005	3.94%	63.32%	26.35%	2.99%	3.41%

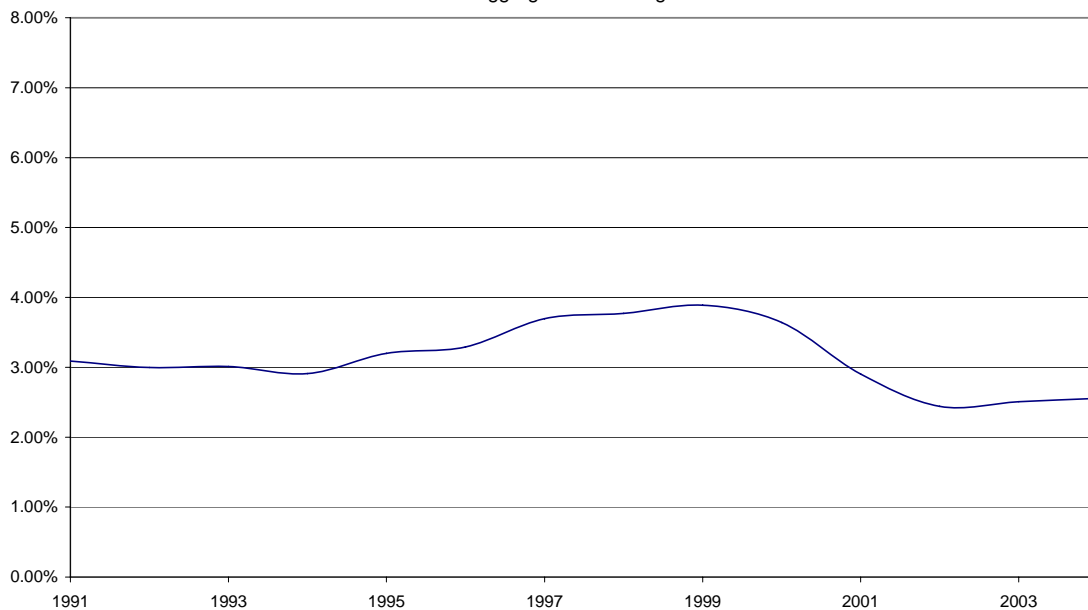
Source: *Flow of Funds* Historical Data. "Cash" category includes checkable deposits, currency, and money market fund shares

This growth in the equity allocation does not, in itself, represent an increase in risk-taking by U.S. life insurance companies. In fact, the equities were purchased largely

to support variable life and annuity products (especially the latter), which soared in popularity as retirement savings vehicles during the 1990's. Variable products tie returns to the underlying equity index, so the consumers bear the risks and rewards associated with asset returns. Companies hold assets supporting these products in *separate accounts*, as distinct from the *general account* of the company---where the company bears the risks associated with asset holdings. Indeed, Figure L-1 (based on data from *A.M. Best's Aggregates and Averages – Life-Health*) show that the equity allocation in the general account remained low and relatively steady throughout the 1990's and 2000's.

Figure L-1
Common Stock as a Percentage of Invested Assets in the General Account
U.S. Life Insurance Industry, 1991-2004

Source: A.M. Best's Aggregates & Averages - Life/Health



It follows that the rise in equity allocation shown in the table L-1 was driven almost entirely by a surge in separate accounts business and an increase in equity holdings within separate accounts. A.M. Best statistics show that total separate account assets amounted to just 16 percent of invested assets in the general account in 1991, but the corresponding figure for 2004 had risen to 49 percent. Moreover, the fraction of separate account assets in common and preferred stock rose from 47 percent in 1991 to 80 percent in 2004.

Thus, the rise in equity holdings is the by-product of a transition from traditional fixed rate products (or products where consumers participate in the investment profits derived from a portfolio composed largely of debt instruments) to variable products. In interviews, market participants noted the trend of putting responsibility and risks associated with retirement finance on the shoulders of workers, with the transition from DB to DC pensions being the most well-known example. In the case of life insurance, the demand for annuity products that protect against longevity risk could well be another manifestation of this transition, and the rise of the equity-linked annuity mirrors the reliance on equity in the DC pension plan---where Americans are increasingly linking their retirement funds to the stock market.

The popularity of variable annuities (relative to fixed annuities) receded in the aftermath of the market declines after 1999, only to rebound after 2002. If variable annuity products return to the rapid growth phase of the 1990's, displacing fixed rate products, it is possible that we will see further transition of life insurance company portfolios toward equities. There are several structural and regulatory trends that may affect the use of variable annuities going forward.

Regulatory Background

In the United States, life insurance companies are regulated by individual state insurance departments, whose leaders coordinate activities through the National Association of Insurance Commissioners (NAIC). Prior to 1993, solvency regulation was practiced largely through enforcement of licensing requirements, monitoring of detailed financial data contained in regular reports to the state authorities (with reliance on various ratios as indicators of impending trouble), and periodic examinations. Starting with the 1993 reporting year, a risk-based capital (RBC) system was introduced. The system developed a risk-based capital level through application of charges to various assets and liabilities, with different levels of regulatory intervention mandated at various ratios of actual capital to the risk-based capital.

Recent Regulatory Reforms

Solvency regulation is evolving in several directions.³⁶ In particular, the adoption of “C-3 Phase II” at the end of 2005 brings changes to the RBC formula concerning variable annuities with guarantees---such as guaranteed minimum death benefits and guaranteed living benefits. These and other guarantees effectively offered annuity holders insurance against bad market outcomes. Stochastic models are to be used to generate charges for the guarantees, which had been under the radar of the original RBC approach.

Sales practices associated with variable annuities are also coming under regulatory scrutiny, as concerns have mounted about aggressive selling tactics with elderly consumers---particularly with respect to inducing “switching” out of one annuity into another. The NAIC is developing a Life Insurance and Annuities Replacement Model Act to enhance disclosure and reduce potential for misrepresentation. Similarly, the National Association of Securities Dealers (NASD) is in the process of drafting rules relating to disclosure of performance and customer suitability requirements with regard to variable annuities and variable life products. In addition, fines have been levied on sellers by the NASD, NASD arbitration panels, and state securities regulators for deceptive sales and switches.

Assessing the Impact on the Life Insurer Assets and Allocation

It is widely recognized that life insurance companies both underestimated and failed to properly manage the risks involved with the secondary guarantees associated with variable products. These guarantees seemed to be worth little during the bull market of the 1990’s, but insurers were burned when equity prices declined sharply after 1999. In addition to stimulating reform of the RBC formula, the experience led insurers to adjust the pricing of the guarantees and to implement hedging techniques.

The absence of adequate penalties for variable annuity guarantees in the RBC formula may have made some contribution to the growth of the guarantees in the 1990’s,

³⁶ We do not attempt to cover all of those directions here. However, a notable change was the implementation of Regulation XXX in 2000 (and the associated Actuarial Guideline AXXX), which toughened reserve requirements and has led to a flurry of securitization and reinsurance activity aimed at capital relief.

but it seems unlikely that regulation was or is playing the key role. Demand for equity-linked products paralleled surging demand for stocks over the same period. Similarly, the retrenchment after 2000 seems more likely to have been the result of waning investor enthusiasm for equity risk, along with voluntary re-pricing by insurance companies, rather than any anticipation of pending regulatory changes. Indeed, observers expect “C-3 Phase II” to have a modest impact due to the gradual timetable of its adoption and the long lead time before the current implementation, which gave companies ample time to prepare. Similarly, aggressive sales and switching techniques may have contributed to the spectacular growth of variable annuity holdings, but it seems unlikely that rules and reforms relating to sales practices will have first order effects on restraining the sector going forward.

This assessment by observers was echoed in our interview of a life insurance company investment manager, who expected variable products to be growth areas in the years ahead – with little restraint from RBC regulation.

In summary, given the industry’s traditionally conservative approach to investing in the general account, it seems likely that changes in the industry’s asset allocation will be driven largely by separate account assets. Consumer preference for variable versus fixed rate products has the potential to profoundly shape the industry’s overall portfolio: As consumers bear more and more responsibility for retirement finance, the role of individual annuities looms ever larger.

What will consumers buy? Brown, Mitchell, and Poterba³⁷ identify potential roles for both inflation-indexed annuities and equity-linked annuities, arguing further that equity-linked products may be the preferred product within the annuity universe by those with low-to-moderate risk aversion because of the higher expected returns. Yet, despite the rapid growth of variable annuities, we have little empirical analysis of the determinants of household demand for the product. A recent paper by Brown and Poterba³⁸ identifies this gap in knowledge and makes some steps toward filling it. Their

³⁷ Brown, J.R., Mitchell, O.S., and Poterba, J.M. (2001), “The Role of Real Annuities and Indexed Bonds in an Individual Accounts Retirement Program,” in Campbell, J.Y., and Feldstein, M. (eds.), Risk Aspects of Investment-Based Social Security Reform, Chicago: University of Chicago Press.

³⁸ Brown, J., and Poterba, J. (2006), “Household Ownership of Variable Annuities,” *National Bureau of Economic Research Working Paper #11964*.

data, based on the 2001 Survey of Consumer Finances, suggests room for further growth: only 5 percent of U.S. households own variable annuities, and the figure for households headed by someone 65 or older being closer to 10 percent. As is the case with other financial assets, ownership of annuities is strongly correlated with age, income, wealth and education.

As for possible regulatory or structural influences, Brown and Poterba note the importance of taxes. Variable annuities accrue interest, dividends, and capital gains that are not subject to tax until the holder receives payouts, at which point they are taxed at ordinary income rates. Thus, holders of annuities can defer taxes until the point at which they start drawing down. Tax avoidance has been identified as an influence in previous research by Gentry and Milano,³⁹ who observe a correlation between state income tax rates and annuity purchases.

Brown and Poterba analyze the effects of the reduction in marginal tax rates on capital gains and dividends contained in the Jobs and Growth Tax Relief Reconciliation Act of 2003. This reduction makes the alternative of holding a mutual fund in a taxable account more attractive relative to the variable option, and significantly more so: Their estimates show that the law change reduces the breakeven expense differential⁴⁰ between variable annuities and mutual funds by about 70 basis points or more (depending on the holding period). Moreover, even for long holding periods, the law change brought the breakeven expense differential well below the actual expense differential that prevails today. While their exercise falls short of a definitive empirical analysis, it does suggest that demand for variable annuities may well be sensitive to tax policy, as tax rate differentials will affect their attractiveness relative to other investment strategies.

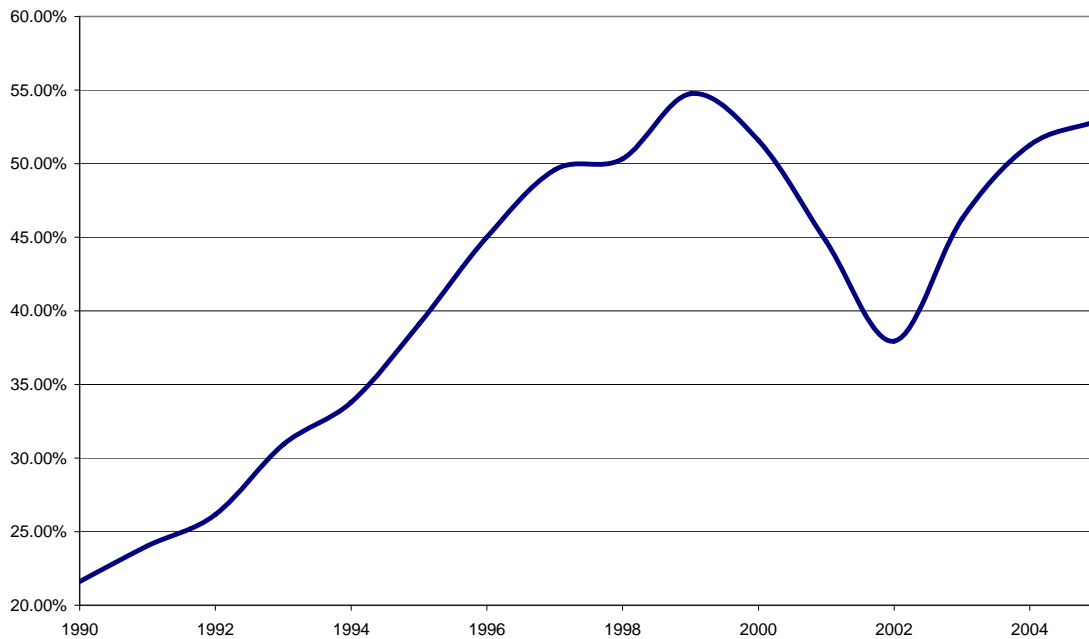
³⁹ Gentry, W.M., and Milano, J. (1998), "Taxes and the Increased Investment in Annuities," *National Bureau of Economic Research Working Paper #6525*.

⁴⁰ Brown and Poterba define this expense differential as the difference between variable annuity expenses and mutual fund expenses at which the investor would be indifferent between the two vehicles.

2. Mutual Funds and Hedge Funds

Figure M-1 shows the spectacular growth in equity holdings of U.S. mutual funds (including money market, equity, bond, hybrid, closed-end, and exchange-traded funds---but not funds supporting variable annuities) during the 1990's. Assets in mutual funds amounted to just over a trillion in 1990, with 22 percent of the total in equities. By 1999, mutual funds held more than \$6 trillion, with 55 percent of assets in equities. The equity allocation slipped after 1999, dipping below 40 percent at year-end 2002, before recovering to 53 percent at the end of 2005---at which point the industry was managing about \$9 trillion dollars of assets in total.

Figure M-1
Percent of U.S. Mutual Fund Assets in Equity, 1990-2005



It is important to note that these “allocation” shifts have likely been driven, in large part, by investor decision-making (decisions about which funds to buy shares in) and changes in the value of the underlying holdings (e.g., the market value of equity assets surged with the bull market of the 1990's, and receded with stock market declines after 1999), rather than by the discretion of mutual fund managers. In other words, a large part of the change in the composition of industry assets over the period can be attributed to 1) where the money was flowing and 2) which assets were appreciating.

By some estimates (e.g., *Pensions & Investments*, April 17, 2006), hedge fund assets now exceed \$1 trillion. Hedge funds are typically not counted along with mutual funds, but they are now a significant asset class in their own right: Hedge funds hold assets amounting to between 10 percent and 15 percent of assets held in mutual funds.

Regulatory Background

The Securities Act of 1933, the Securities Exchange Act of 1934, the Investment Company Act of 1940, and the Investment Advisers Act of 1940 form the foundation of mutual fund regulation. These acts establish the Securities and Exchange Commission (SEC) as the regulator of mutual funds and sellers of mutual funds (such as broker-dealers). In addition, this legislation restricts fund investments, establishes rules regarding record-keeping and reporting, and requires disclosure to prospective investors through the fund prospectus.

The National Securities Markets Improvement Act of 1996 exempts sellers of mutual funds from regulation by the states, but preserves the rights of the states to investigate and bring enforcement actions with respect to fraud, deceit, or unlawful conduct. This opening was used by the New York Attorney General in initiating recent investigations of the industry. These investigations revealed various abuses, most notably the practices of “market timing” and “late-trading” schemes that allowed some investors to profit at the expense of others.

The investigations led the SEC to propose a number of new rules for funds and advisor. Specifically, rules have been crafted to eliminate late trading, enhance disclosure on policies relating to market timing and other items, and toughen compliance requirements and funds and fund advisors.

Hedge funds are largely unregulated, save for recent rules requiring hedge fund advisors to register. As of 2006, a fund itself is required to register unless it features a “lock-up period” (a period during which investors may not withdraw their funds) of greater than two years.

Assessing the Impact on Mutual/Hedge Fund Asset Allocation

The recent rule changes seem unlikely to affect fund flows and fund allocation significantly. However, both mutual funds and hedge funds are likely to be affected significantly by several regulatory and structural changes under way in the pension and life insurance industries.

In particular, the ongoing shift from DB to DC pension plans is contributing to growth in mutual fund assets. *Flow of Funds* statistics indicate that, as of year-end 2005, 37 percent of DC assets are held in the form of mutual fund shares versus 11 percent of DB assets. These figures suggest that the anticipated closure of DB plans in response to reforms of accounting standards and ERISA funding rules may lead to further growth in mutual fund assets.

Hedge funds are currently benefiting from strong demand from pension funds and endowments that apparently view the asset class as offering relatively high returns that are uncorrelated with the performance of other financial assets. Interviews with pension market participants suggested that this trend seems likely to continue in the short term, although it is unclear whether the pending reforms will discourage sponsors from hedge fund investment. Some are skeptical of the growth in hedge fund activity: One interviewee (a mutual fund and hedge fund manager) doubted that there was sufficient managerial talent to justify the overwhelming rush into hedge funds.

As for asset allocation, the trends in pensions and life insurance both seem to favor heavier equity allocations within the mutual fund industry. For example, data from Holden and VanDerhei⁴¹ suggest that equity fund assets amount to more than half of mutual fund assets in 401(k) plans. Thus, the transition from DB to DC may serve not only to increase assets held in mutual funds, but also to reinforce the trend toward equities within the mutual fund industry. Likewise, growth in equity-linked annuities and insurance products may produce growth in equity index mutual funds supporting those products.

⁴¹ Holden, S., and VanDerhei, J. (2005) "401(k) Plan Asset Allocation, Account Balances, and Loan Activity in 2004," *Investment Company Institute Perspective* 11.

III. Mexico

The case of Mexico is very different from the experience of the United States, since the extent and deepness of financial markets, as well as the development of institutional investors, is much smaller. Nevertheless, several reforms and policy changes have been implemented during the past decade in order to improve the overall functioning of the Mexican financial system. Presumably, these changes must have had an impact in the saving behavior of the households and on the asset allocation of the institutional investors. However, many reforms have occurred in a very short span of time and some of the policy changes have been too recent to be reflected yet in the (sparse) data that is currently available.

Mexican regulatory changes can be divided in four main topics: changes directed towards improving supervision by authorities and the underlying legal framework; changes designed to promote savings and market development; other actual changes; and prospective reforms.⁴²

III.A. Changes to improve the legal framework and supervision by authorities

- *Reforms to Regulations on Financial Institutions*

Their main objective of a set of reforms was to strengthen the structure and organization of financial entities. They were oriented towards improving the quality of capital of financial institutions by allowing greater participation of both domestic and foreign investors. The main reforms involved initially only credit institutions, the stock market, and other financial groups. Later on, there were changes to the regulation of insurance companies and the Federal Law of Surety Bonding Companies (*Afianzadoras*) in order to grant access to foreign capital.

- *Creation of the Banking and Securities' National Commission Law.*

This new law merged the National Banking Commission and the National Securities Commission into a single regulatory entity. It encompassed all the attributes of the whole financial system, except for the insurance and surety bonding companies. This

⁴² Credit for this summary of changes in regulation belongs to Juan Carlos Navarro.

new commission absorbed the important tasks of prudential regulation to maintain liquidity, solvency and stability of financial intermediaries, by means of risk diversification, capitalization, and other preemptive provisions.

- *Credit Rating Verification*

Institutions were obliged to verify the moral and credit quality (history) of their clients through the services of credit agencies.

- *Banking Savings Protection Law.*

After the banking crisis of 1995, a new foundation was needed for the systemic protection of bank deposits. Thus this initiative created the Institute for the Protection of Bank Savings (*IPAB*), providing a limited deposit insurance for the banking system. A secondary objective of *IPAB* was to take care of the final resolution of the banking crises.

- *Modifications of the Investment Regime for Insurance Companies' Technical Reserves.*

It establishes general guidelines and specific limits for the investment of insurance companies' technical reserves. The limits are set in terms of type of investments, type of issuer, liquidity, currency, indexing, credit ratings, etc.

- *Mutual Funds Law.*

It was intended to regulate the organization and promote the well-functioning of this sector. The following types of mutual funds were considered: variable income (shares and debentures); fixed income (debt securities); capital funds (shares, debentures, and corporate bonds); non-banking financial institutions (*SOFOLÉS*). Mutual funds were also allowed to conduct repurchase agreements on government securities and bank paper.

Reforms to the Law on Market Securities.

Amongst other issues, it allowed brokerage houses, insurance and surety bonding companies, pension funds' managers (*AFORES*), and mutual funds to be shareholders of the Mexican Stock Exchange (*BMV*).

III.B. Changes to promote savings and market development

- *Reform of the Social Security Mexican Institute (IMSS): Private Sector Pensions.*

Perhaps the most transcendental of the reforms listed here, it involved the transformation of the mandatory pension system of the (formal) private sector from a defined benefit pay-as-you-go scheme to a defined contribution scheme. Under the new legislation, individual accounts were created and private pension administrators (*AFORES*) were allowed to manage pension accounts that were previously under public management. The new pension funds were called *SIEFORES*.

- *Reforms to the Credit Institutions' Law.*

Credit institutions were allowed to conduct repo agreements and to use a lending facility via third parties, and not necessarily through brokerage houses. Non banking financial institutions (*SOFOLLES*) were brought under tighter control by the Ministry of Finance (*SHCP*).

- *Mutual Funds, Common and Debt Securities: Modifications*

These regulations were implemented to give the same treatment to fixed income and equity funds; to help them in their liquidity management tasks; and specifically regarding repurchase agreements. Mutual funds should price repo holdings at market value.

- *Pension Funds' Investment Regime*

Since its creation, the new mandatory private pension system has experienced several changes. Among the most important, those that focus on the investment regime of the *SIEFORES* stand out. The objective behind these changes is to allow the *SIEFORES* to manage portfolios with the highest possible return and a relatively low risk that

stand in harmony with their investment horizon. For instance, the possibility of investing abroad and on equity-linked instruments was allowed.

- *Law on Federal Mortgage Society (SHF)*

The Society has the aim of promoting the developing of primary and secondary market for housing credits, by means of guarantees oriented for construction, and acquisition of houses, as well by the promotion of securitized mortgages.

- *Repurchase Agreements and Strips*

The legal framework of repo operations for Brokerage Houses, Mutual Funds, and Pension Funds, is changed. In particular, the modifications are in terms of the agreement of bilateral contracts and the guarantees backing the operations. Moreover, the possibility of stripping bonds is allowed.

III.C. Other changes

- *Money Laundering and Terrorism*

The legislation of the following groups suffered important modifications regarding the obligation to improve information on operations, actions or omissions in the financial system that could be related to terrorism: credit institutions, people's savings and credit, mandatory retirement fund system (*SAR*), surety bonding institutions, market securities and mutual funds.

III.D. Prospective changes

- *Reform of public sector pensions*

The reform of the pension system has comprised only the (formal) private sector so far. Public sector employees, both in different layers of government as well as in other public entities, remain largely under a defined benefit pay-as-you-go system that is clearly a heavy burden for the public finances. The discussion of reforming these pensions—along the lines of the 1995 reform of private sector pensions—has been delayed due to the lack of political consensus.

▪ *Introduction of Benchmarks for SIEFORES*

Risk management of *SIEFORES* has been based mostly on setting limits to selected concepts of VaR. In addition, the pension regulator, *CONSAR*, has tried to promote competition in the industry exclusively in terms of the commissions charged by the *AFORES*. However, both risk management and competition could improve by the adoption of investment benchmarks. There is currently a process whereby each *AFORE* will select its own benchmark. Evaluation of performance against the benchmark will follow shortly, at least as a preliminary exercise.

III.E. Asset Allocation of Institutional Investors in Mexico

As mentioned before, many financial sector reforms have been undertaken in Mexico in a short period of time to disentangle their individual effects on the asset allocation of institutional investors. Moreover, some of these changes have occurred so recently that it is too early to evaluate their impacts. Nevertheless, Table 4 presents the assets under management for the most important institutional investors in Mexico—mandatory pension funds (*SIEFORES*), insurance companies and mutual funds—as well as their composition.

Table 4
Institutional Investors in Mexico: Assets under Management

	Siefores			Insurance Companies		Mutual Funds		
	1998	2000	2005	2000	2005	1998	2000	2005
Nominal Value of Outstanding Stocks in Millions of Pesos								
ASSETS	57,594	164,166	599,965	116,342	255,964	123,872	184,923	512,633
Cash and Deposits	0	0	1	598	1,607	0	0	0
Bills and Bonds	56,522	163,553	578,781	50,893	158,939	107,262	160,764	444,045
<i>Government Securities</i>	<i>54,748</i>	<i>151,440</i>	<i>481,503</i>	<i>23,965</i>	<i>104,509</i>	<i>18,963</i>	<i>89,357</i>	<i>303,699</i>
<i>Other Securities</i>	<i>1,774</i>	<i>12,114</i>	<i>97,278</i>	<i>26,928</i>	<i>54,430</i>	<i>88,299</i>	<i>71,408</i>	<i>140,346</i>
Shares	0	0	8,005	10,796	172	12,662	22,465	66,493
Other	1,071	612	13,179	54,055	95,246	3,947	1,694	2,095
% of Total Assets								
ASSETS	100%	100%	100%	100%	100%	100%	100%	100%
Cash and Deposits	0%	0%	0%	1%	1%	0%	0%	0%
Bills and Bonds	98%	100%	96%	44%	62%	87%	87%	87%
<i>Government Securities</i>	<i>95%</i>	<i>92%</i>	<i>80%</i>	<i>21%</i>	<i>41%</i>	<i>15%</i>	<i>48%</i>	<i>59%</i>
<i>Other Securities</i>	<i>3%</i>	<i>7%</i>	<i>16%</i>	<i>23%</i>	<i>21%</i>	<i>71%</i>	<i>39%</i>	<i>27%</i>
Shares	0%	0%	1%	9%	0%	10%	12%	13%
Other	2%	0%	2%	46%	37%	3%	1%	0%

The first remarkable feature is the impressive growth of the outstanding stock of assets under management: in just five years (2000 to 2005) they have increased from a lower bound of a factor of two (insurance companies) to almost four times (*SIEFORES*). These are considerable expansions even after adjusting for inflation (about 4.5 percent per annum on average for the same period).

The second important feature is the strong concentration on government securities that all these institutional investors hold. While insurance companies held 41 percent of their assets in government bonds and bills in 2005, mutual funds held 59 percent and *SIEFORES* 80%. However, as the investment regime restrictions for pension funds have been relaxed, *SIEFORES* have diminished the share of government securities in their portfolios (from 95 percent in 1998). Regarding other features from the data, mutual funds—and particularly equity funds—are the only institutional investor that hold a significant share of assets in the form of shares. The low holdings of shares in insurance companies' portfolios is due to capital requirements associated with this kind of assets, while their relatively high share of other assets reflects loans and reinsurance.

IV. Australia

Defined benefit (DB) schemes have not been widespread within the private sector in Australia. Historically, they have been concentrated in highly-unionised industries or those sectors which originally were under government ownership. Many of these schemes are closed to new members, with superannuation contributions now being channeled into defined contribution plans for employees. Membership of DB pension funds has fallen from over 80 per cent of those with superannuation plans in the early 1980s to around 15 per cent in 2000, and it is likely that the proportion has fallen further over recent years. Currently, it is estimated that around 10 per cent of all superannuation assets are accounted for by DB funds. And while the relative size of DB funds has shrunk considerably over the past few decades, for some companies that still operate them, the investment performance of the fund may have a significant effect on its operations.

IV.A. Accounting for Pensions by Companies in Australia

A factor which may have some impact on asset allocations is the introduction of international accounting standards covering the treatment of a company's defined benefit pension fund. In Australia, the relevant standard compliant with IAS 19 is *AASB 119 Employee Benefits*. Prior to the introduction of AASB 119, the funded status of a company's defined benefit plan was not recognised on the balance sheet and the actual gains or losses from operating the DB scheme during a period would not show up in the income statement. Instead, the funded status of the scheme would simply be covered in the notes to the accounts, with just the amount of the cash contribution to the fund being included as the expense for operating the fund in the income statement.

The introduction of AASB 119 brings several major changes in accounting for a company's DB fund. Specifically, the company is required to:

- recognise a net defined benefit liability or asset on the balance sheet. This comprises the present value of the DB obligations at balance sheet date, net of the fair value of the plan's assets at balance sheet date; and
- recognise changes in the value of the net benefit on the income statement or take them directly to retained earnings. Changes in the value of the net benefit arises from a variety of sources, including an increase in the value of the obligation due to a current employee's service, an increase in the obligation because the benefits are now one period closer to settlement, actuarial gains or losses for the plan (due to either changes in actuarial assumptions or the effect of differences between previous assumptions and what has actually happened) and the effects of changes in past service costs.

In broad terms, these changes imply that an asset or liability must be recognised on the balance sheet and that it will reflect the funded status of the DB plan. As well, the actual cost of operating the plan for the period will be more accurately reflected in a company's income statement. Application of the new standard began from the first annual reporting period after 1 January 2005.

Depending upon the size of these plans relative to the size of the company's overall operations, these changes could potentially add greater volatility to both the balance sheet and the income statement. However, the extent to which the volatility may be dampened by the smoothing provisions available to companies remains an open question. Under the new standards, substantial smoothing of results is still permitted.⁴³ By using a 'corridor' approach to account for changes in the fund's valuation, companies are able to substantially reduce the extent to which changes in the funded status of the DB plan flow through into the company's accounts. In particular, actuarial gains or losses exceeding 10 per cent of the gross obligations or assets of the plan may be smoothed over the average remaining working lives of participating employees. Past service costs can also be averaged over an extended period.

It is also worth noting that the revised accounting standard requires that the discount rate used be a long-term high-quality corporate bond yield, except in cases where the country does not have a liquid bond market. Australia is deemed to fall into the latter category, and as a consequence, a long-term government bond rate is to be used. Typically, this is below the discount rate used by actuaries when calculating the funded status of a plan for determining contribution requirements, thereby implying that the DB liability may appear larger under the new accounting rules.

IV.B. Some Recent Evidence on DB Accounting

With the substantial shift away from defined-benefit to defined contribution schemes having already occurred in the corporate sector in Australia, the impact of these accounting changes may be significantly more muted than in other countries where DB schemes still predominate. Indeed, results compiled by the RBA suggest that this is the case.

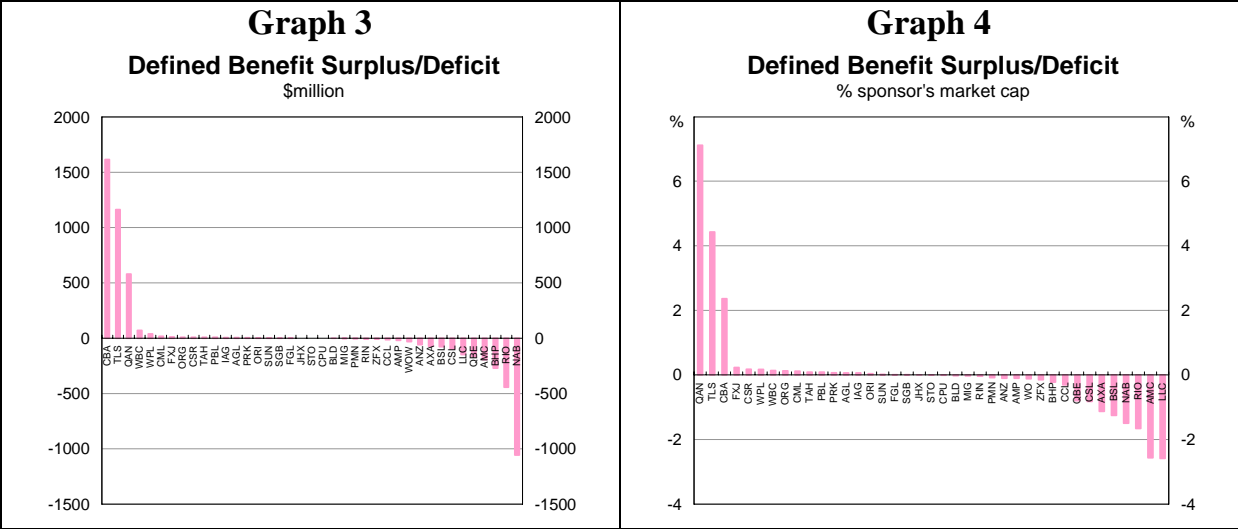
We have used figures from recent full-year published accounts of the sixty largest listed companies in Australia. Of those 60 institutions, 38 report DB schemes. These companies represent about 83 per cent of the capitalization of the top 200 listed

⁴³ While the accounting standards board allows smoothing practices, it states that immediate recognition of the gains or losses remains the most conceptually sound and useful approach. See '*Revised Accounting Standards on Employee Benefits AASB 119 Employee Benefits*', AASB Media Release 23 December 2004.

of obligations – although the aggregate masks quite a divergence at the company level of the extent of over or underfunding of pension assets. A couple of funds are overfunded in excess of \$1 billion, while the vast majority of companies tend to run relatively small over/underfunded positions (Graph 3). Underfunded companies were showing an average funded ratio of close to 90 per cent, well above the indicator used by the supervisory authority, APRA, for assessing whether a plan is materially underfunded.⁴⁴ Broadly speaking, APRA considers schemes with funding ratios under 80 per cent to be materially underfunded and would require remedial arrangements to be put in place for reducing that shortfall within a reasonable time frame. Typically, this is around three years, though APRA does not take a prescriptive approach dealing with such funding shortfalls.

Of the large DB plans that are underfunded, typically the sponsor companies have significant offshore operations. For instance, one company had a funding gap of around \$1 billion, which represents a funded ratio of around 78 per cent. Its operations in the UK account entirely for this underfunding gap, and they have recently announced a number of measures – including a large one-off contribution and reduced benefits - that are projected to reduce the deficit by half. While the underfunding appears sizeable in nominal terms, it represents just 1½ per cent of its market capitalization (Graph 4).

⁴⁴ See ‘*Current Prudential Issues in Superannuation*’, APRA, 14 August 2003.



For most other companies in the sample, the extent of the over/underfunding is fairly small. Overfunded positions of more than 4 per cent of market capitalization are carried by just a couple of funds, while the largest underfunded position represents less than 2½ per cent of the company’s market capitalization.

IV.C. Implications of the Accounting Changes on Asset Allocation

Given that the size of the DB surplus or deficit for the vast majority of companies in the sample is small, both in absolute terms and relative to the company’s market capitalization, we would not expect that the accounting changes would have a significant impact on behaviour and on asset allocations.

Indeed, this seems to be the case having spoken with several of the larger funds in the sample. Equities remain the largest asset class by a wide margin. While they recognise that their DB plans have the potential to generate greater volatility on their balance sheet and income statement, they do not see this as having a material impact on their activities. Some had considered or were considering asset-liability management strategies for managing exposures arising from the DB plan. But they did not see this as a particularly attractive option at the present time and had not moved to any significant extent. Returns from equity markets have been relatively high in recent years, allowing

them to improve the funded status of the plans, while fixed interest returns appear quite limited in the present historically-low interest rate environment.

Institutional investors' asset allocation to direct infrastructure investments in general remains small, less than 1% for OECD pension funds, and the "green" investment component remains even more limited. This is for a range of reasons – from regulatory and policy uncertainty, to a lack of suitable financing vehicles, investor inexperience with direct investing and with new technologies and asset classes, as well as market and government failures. The second section comprises four case studies on utility-scale solar PV power generation in the United States, sustainable agriculture in Brazil, off-shore wind energy in the United Kingdom and the securitisation of on-shore wind farms in Germany and France⁵. Institutional investors are corporations, trusts, or other legal entities that invest in financial markets on behalf of groups or individuals, including both current and future generations. On a global basis, institutional investors represent more than US\$70 trillion in investable assets, and, as such, wield significant influence over capital markets. There has been an important shift in the asset allocation of institutional investors over the last half century. In the 1970s, most pensions and endowments invested almost exclusively in domestic, fixed-income instruments. In the 1980s, many institutional investors began to invest in equity markets and often pursued a long-term strategic allocation of 60% equities/40% fixed income.