CIEBA[sm]

THE COMMITTEE ON INVESTMENT OF EMPLOYEE BENEFIT ASSETS

The U.S. Pension Crisis

Evaluation and Analysis of Emerging Defined Benefit Pension Issues

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Association for Financial Professionals

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Executive Overview

CIEBA Report on Emerging Pension Issues

For the past several decades, the U.S. corporate defined benefit (DB) system has contributed significantly to the retirement needs of millions of Americans. Consequently, the aggregate long-term retirement system in America is perhaps the finest in the world. Today, however, that system is under attack and the future stability of the U.S. pension system is at risk.

Recent threats come from the unintended, and inadequately considered, implications stemming from an unprecedented, and largely uncoordinated, series of emerging accounting, legislative and regulatory initiatives. Specifically, those initiatives include new accounting methods under consideration by the Financial Accounting Standards Board (FASB), funding rules crafted by the Treasury Department, proposed changes to the Pension Benefit Guaranty Corporation's (PBGC) risk premium system, and the means by which various rating agencies treat pension obligations.

Collectively, these issues could redefine the measurement of corporate DB plans, increase their long-term costs, lower benefits paid to millions of participants and potentially upset the U.S. equity market. Unintentionally, emerging pension rules and regulations could further reduce the funded status of America's major corporate pension plans and threaten the future security of the nation's retirement system.

Taken collectively or individually, U.S. corporations are likely to interpret these emerging initiatives as major alterations in the fundamental underpinnings that have supported the corporate commitment to DB plans for more than two decades. The intermediate impact could be a potentially massive move out of stocks into bonds and the initiation of a secular process whereby pension benefits would decrease for millions of participants.

This report, therefore, attempts to provide some of the actual data needed to analyze the potential effects of these emerging pension issues properly. It also serves as a reminder that our nation boasts a sound, long-term national retirement strategy based on a foundation of core benefits (Social Security and DB pension plans) and flexible benefits (personal savings and defined contribution [DC] plans). It is the ratio and health of those two types of retirement programs that allow us to achieve our long-term corporate and societal goals.

CIEBA's Objective

What is needed is serious, objective and particularly collective reflection on how to best fund, account for, invest and support our nation's pension system. This report was prepared with that objective in mind.

Legislators, regulators and standard setters need to recognize that healthy pension reform must be broadly coordinated. CIEBA calls on them to meet together with representatives of plan sponsors and participants to develop a blueprint for considering pension reforms that takes into account the collective consequences as well as the individual impact of any proposed changes.

Summary of the CIEBA Report

The data and analysis provided in this report include the following:

- Data on historical and prospective investment behavior supplied by more than 60 senior corporate investment officers, representing approximately $500 billion in pension assets.

- Data on the current structure of corporate defined pension benefits and the potential implications of these various emerging issues on future benefit levels.

- A review of the relevance and importance of the U.S. corporate pension system to the country as a whole, and, specifically, to nearly 35 million Americans.

- A macro-economic evaluation of the potential, aggregated effects of these emerging pension issues on growth of the U.S economy, employment, the U.S. equity market, interest rates and, ultimately, the funded status of corporate pension plans.
- A microanalysis of the actual effects and real-world implications of several of the most controversial, emerging proposals.

The following are some of the key findings in this report:

- Seventy-five percent of large U.S. corporations continue to offer a DB pension to their employees.

- DB plans currently cover approximately 35 million Americans and their families. This is an all-time high.

- Approximately 50% of corporations are likely to seriously consider reducing pension benefits if these pension initiatives are adopted.

- Corporations have been stable and effective long-term investors, primarily through disciplined, long-term commitments to the world's equity markets. As a result, the median 10-year return for corporate pension plans has been approximately 9.4% per year, while the corporate return on asset assumption over the period has been approximately 8.8%.

- Approximately 75% of aggregated pension liabilities continue to relate to traditional, final average pay plans, although new and more flexible plans have been implemented over the past several years.

- Issues most likely to have serious individual effects are as follows: the potential cessation of accommodating long-term investing practices via smoothing realized and unrealized gains and losses over several years (FASB); the movement to an unsmoothed yield curve approach by the Treasury Department for determining required pension funding; and the alteration of the risk premium system currently used to fund the PBGC. Each factor will individually discourage long-term equity investing. Collectively, they may prove to be overkill, and have significant and outsized unintended consequences.

- Approximately 75% of senior investment officers would alter their plan's asset allocation policy significantly, always by selling stocks and buying bonds – potentially in a major scramble for duration.

- The implied asset shift could potentially exceed $650 billion dollars and cause a decline of perhaps 10% in the U.S. equity markets, while also causing interest rates to fall and the yield curve to flatten. The long duration, investment grade bond market cannot effectively accommodate flows of this magnitude today.

- The fall in stock prices, combined with the decline in interest rates, would have the unintended consequence of reducing the funded status of most pension plans by perhaps 10% or more. There would also be moderately negative impacts on general economic activity and employment trends.

- The cessation of accommodating long-term investment practices via smoothing is an emerging accounting convention in Europe, where the corporate pension system bares little resemblance to that in the U.S. Much of Europe's system is largely unfunded and is smaller. If adopted here, the percentage increase in annual earnings volatility could approach 25%, while also mismatching the timing of assets and liabilities, and treating the pension system completely different than other "debt" on the corporate balance sheet.

- The use of an unsmoothed corporate yield curve for funding purposes would potentially double or triple the expected volatility in annual funding, with essentially little or no intermediate-term increase in the accuracy of the actual secular estimate of the underlying pension obligation. Potentially, its use would seriously undermine other governmental efforts to manage the U.S. economy effectively.

- The alteration of the PBGC risk premium system toward a system based on equity exposure is misguided. The PBGC has not demonstrated that the equity exposure of terminated plans was an important factor in the failure of various plans. In addition, the current proposal does not consider either the quality of the sponsor or its individual funded status. The actual long-term impact on the PBGC may also be significantly overstated, once actual historical default rate data is considered.

- If the corporate DB system is undermined, lower income Americans are likely to be affected most, increasing the pressure on government programs to make up the potential shortfall, at a time when those programs are under stress already

Most DB plans are sponsored by financially solvent "going concerns," capable of operating over lengthy time horizons that match the long-term nature of pension obligations.

The U.S. corporate pension system has matured along with the country's demographic cycle. Active participants in the aggregate national DB system are now roughly equal to inactive participants (primarily retirees).

Because of the impending retirement of the Baby Boom generation, the U. S. pension system is more important to the nation and to beneficiaries than ever. Major changes that have the potential to do real damage should not be undertaken lightly and simply in response to the unique market conditions of 2000-2002.

Legislators, regulators and standard setters need to recognize that healthy pension reform must be broadly coordinated. Therefore, CIEBA's hope is that a collective process can be established that includes plan sponsors, key policy makers and standard setters. Within that collective forum a viable, long-term and comprehensive blueprint for properly considering pension returns can be implemented. Furthermore, within that framework a comprehensive review of the funding rules and the regulatory regime that governs DB plans would be both desirable and appropriate. However, it is critical that any proposed changes be considered collectively, and not in isolation.

Introduction

The CIEBA Project on Emerging Pension Issues

In the fall of 2003, the Committee on the Investment of Employee Benefit Assets (CIEBA), which represents more than 110 of the nation's largest pension and retirement funds, initiated a two-part study to provide background and objective analysis on emerging pension issues. In the first part of the project, CIEBA canvassed its members on the current status of their pension plans and ways their plans might change in response to the emerging issues. Sixty-five CIEBA members responded to the study, *CIEBA Survey on Emerging Issues*, representing almost $500 billion in DB plan assets. CIEBA also compiled 10 years of historical data on plan asset management from its annual membership profile surveys.

For the second part of the project, a team of financial and economic experts was invited to provide independent analysis. The following firms offered significant support for this project: Goldman, Sachs (GS), Morgan Stanley (MS), Hewitt Associates and Bridgewater Associates. *[See Appendix A for a full list of individual experts.]* Each of the four firms produced a report examining the impacts of emerging issues on pension plans, retirement security for American workers and retirees, and/or potential effects on the larger economy. It should be noted that CIEBA does not endorse all views expressed herein. *[See Appendices B-F for those full reports.]*

This report is a summary and evaluation of the CIEBA member survey, the data collected, and the reports produced by the outside experts.

CIEBA's Outlook on the Emerging Pension Issues

CIEBA was formed in 1985 to provide a nationally recognized forum and voice in public policy for ERISA-governed corporate plan sponsors on fiduciary and investment issues. Members are the senior corporate financial officers who individually manage and administer ERISA-governed corporate retirement plan assets. Focused on the issues of pensions, CIEBA is a committee of the Association for Financial Professionals (AFP), the membership organization of global corporate financial professionals. AFP is comprised of more than 14,000 individual members from a wide range of industries.

CIEBA today represents more than 110 of the nation's largest pension and retirement funds. CIEBA members manage $1 trillion of plan assets on behalf of 15 million plan participants and beneficiaries. More than one-quarter of all participants in corporate DB plans are in plans managed by CIEBA members.

Since its founding, CIEBA has been committed to strengthening the private sector retirement system so it can continue providing retirement income for millions of Americans. CIEBA strongly believes that the pillars necessary to assure adequate retirement income for most Americans are: 1) a healthy, universal public system (e.g., Social Security); 2) strong employment-based retirement plans (e.g., both DB and DC plans); and 3) individual savings. Undermining key components of any of these pillars will endanger the future retirement security of millions of American families.

CIEBA members also recognize that the private retirement system's assets provide a significant source of long-term capital essential for growth.

Challenges Facing Defined Benefit Pension Plans

We are entering a period of potentially unprecedented change in the ways U.S. corporate pension plans are regulated, accounted for and funded. Policymakers, opinion leaders, regulatory and quasi-regulatory organizations, and other stakeholders are all considering proposals that would significantly alter the way pension plans operate. These proposals represent a massive change in the "rules of the game" that have supported the DB system for more than a decade.

Many of the emerging issues stem from the unprecedented period experienced between 2000 and 2002. While adverse periods can produce positive change, they also can trigger an over-reaction that compounds the problem with unintended, negative consequences. Further, each of the emerging issues represents a single response by an independent entity, with little or no consideration of their overall effects.

The corporate DB pension system is too important to major corporations (and the U.S.) to simply institute many or all of the proposals without an extensive and objective analysis of their individual and, more importantly, their collective impact.

Overview of Emerging Pension Issues

A number of proposals have been advanced to fundamentally change the way traditional pension plans are treated under current accounting and funding rules, by credit rating agencies and the PBGC, the government corporation that insures pension plans. Proponents argue that the changes will make systemic measurements more accurate, increase transparency for investors and reduce risk for the PBGC. However, there has been little or no research to support these contentions.

Emerging Pension Issues:
There are seven main issues being debated on various levels today:

Accounting
Elimination of smoothing (FASB) – Under current rules, pension plan assets and liabilities are averaged over several years when reported on corporate balance sheets. This averaging or "smoothing" reduces earnings volatility.

Increased disclosure (FASB) – FASB recently put in place new rules requiring companies to disclose more information about their pension plan assets, benefit costs and obligations, and cash flows.

Redefinition of core earnings (Rating Agencies) – Standard & Poor's and other rating agencies are moving to a definition of core earnings that diminishes the importance of pension fund returns.

Funding
Discount rate reform (Congress) – Under current law, pension plan sponsors must use a weighted average of the 30-year Treasury bond interest rate for plan funding and other purposes. Legislation has passed both Houses of Congress to replace the 30-year T-bond rate with a rate based on a high-quality (Aa or better), longer-term corporate bond index for the next two years.

Use of an *unsmoothed* corporate yield curve (Treasury) – The Administration has proposed eliminating a single "smoothed" discount rate for calculating plan liabilities. This proposal requires use of an "individualized" discount rate based on the age of the covered population in a plan.

Credit Ratings
Treatment of the Projected Benefit Obligations (PBO) as debt and the reflection of the risk of various asset classes in ratings (Rating Agencies) – Standard and Poor's and other rating agencies have moved to explicitly treat pension plan PBO as corporate debt.

Pension Benefit Guaranty Corporation (PBGC)
Alteration of the risk premium system toward one based primarily on equity exposure (Academia) – Currently, the amount of the PBGC's variable rate premiums relates directly to the amount of underfunding in pension plans. Proposals have been discussed to relate the variable rate premium to the equity proportion in a pension plan's portfolio. Greater exposure to equities would engender higher premiums.

Guiding Principles Governing Defined Benefit Plans

As the largest organization of corporate pension fund managers, CIEBA believes that America's corporate pensions face a severe crisis that, if not addressed, will threaten the U.S.' retirement strategy. In conducting its analysis of the current, disparate issues challenging the pension system, CIEBA is focused on a core set of guiding principles that include:

I. DB Plans are Desirable and Serve Beneficiaries Well

- DB plans are the financial cornerstone of retirement security for more than 35 million Americans and their families.
- Plans generally provide universal coverage to workgroups, whereas 25+% of workers opt out of DC plans.
- Participants are insulated from investment risk, mortality risk, etc.

II. DB Plans are Long-Term in Nature

- Participants work 20-30 years and receive benefits for 10-20 years.
- Investment decisions should be made recognizing long-term horizons.
- Regulations on funding and accounting should be based on long-term factors, not shorter-term market cycles.

III. Funding Rules Should be Flexible

- Limits on funding in good economic environments should not be overly restrictive.
- Forcing excessive contributions in recessions counters sound monetary policy.

IV. DB Disclosures Should be Transparent and Provide Investors With Relevant Information

V. DB Plans' Policy-Making Should be More Integrated to Ensure Different Prescriptions Don't Kill the Patient

- Today, multiple groups (IRS, FASB, DOL, Congress, PBGC, etc.) set various policies based on a specific focus without considering their overall impacts on the system.

VI. The Complexity of Rules and Regulations Governing DB Plans Should be Reduced

- Multiple, and often contradictory, methods drive excess costs (i.e., different discount rates for funding, accounting, lump sums, etc.).

Corporate Defined Benefit Plans' Role in the Retirement System

Why are Corporate Defined Benefit Plans Important?

Hewitt Associates

- DB plans are a successful and critical part of the U.S.' long-term retirement system. Currently, DB plans cover more than 35 million American employees and their families. Approximately 75% of companies in the Fortune 500 provide a DB pension.
- DB plans represent one of the four pillars of long-term retirement savings. The four pillars can be categorized into Core Vehicles (Social Security and DB plans) and Flexible Vehicles (DC plans and personal savings).
- DB plans are a core retirement system for Americans. DB plans: feature open participation regardless of age or level; generally do not require employee contributions to participate; allocate costs properly to tenured employees; and accrue benefits regardless of changing economic or financial market conditions.
- DB plans can provide substantially more "benefits per dollar" than other retirement savings methods (e.g., DC plans, etc.). Specifically, an extra 1% return from a DB plan can often support up to a 25% increase in future benefits.
- DC plans are not primarily core retirement programs. They generally require elective participation via an employee contribution. Approximately 25% of employees do not choose to participate at any level and 40% of employees earning less than $40,000 do not participate at all; those who do contribute a substantially lower percentage of their income than higher-paid participants.

Defined Benefit Plans are Relatively Effective and Stable Investors are Able to Invest for the Long-Term

Hewitt Associates

- DB plans serve as effective, core retirement programs because they both transfer investment risk and generally produce higher, long-term returns.
- Generally, DB assets are invested more effectively, and are more diversified, disciplined and stable.
- Aggregation produces lower costs and allows for increased risk sharing.
- DB plans are generally supported by high-quality corporate enterprises, viewed as long-term going concerns with either strong, current cash flow, ready-access to financial markets, or both.
- DB plans are highly attentive to total portfolio risk and carry significantly less "Enron" risk (e.g., specific risk).
- The median annualized return earned by large corporate pension systems for the 10 years ending December 31, 2003 was 9.4%, slightly above the long-term annualized return on assets (ROA) assumption over that period, which averaged between 8.5% and 9.0%.
- According to the Dalbar study, over the period from 1984 through 2000, the S&P 500 rose 16.3% per year. However, individual equity investors in U.S. mutual funds earned less than 5.2%. This disparity is attributable to a number of factors, including poor market timing by individuals. Over this same period, the median corporate pension plan earned a return of 13.1% (while generally holding 25% of their portfolios in fixed income).

According to Hewitt Associates, the median, long-term expected return of a typical corporate investment portfolio is approximately 8.8%. In addition, the projected range of potential outcomes narrows considerably as the time horizon lengthens to one consistent with a typical pension plan. *[See Exhibit 1.]*

Exhibit 1: Rate of Return at a Given Confidence Level

Time Horizon in Years	95th Percentile	75th Percentile	50th Percentile	25th Percentile	5th Percentile
1	-12.13%	-.031%	8.83%	18.81%	34.79%
3	-3.82%	3.45%	8.83%	14.48%	28.13%
5	-1.10%	4.64%	8.83%	13.18%	19.75%
10	1.71%	5.85%	8.83%	11.89%	16.45%
20	3.75%	6.71%	8.83%	10.98%	14.16%

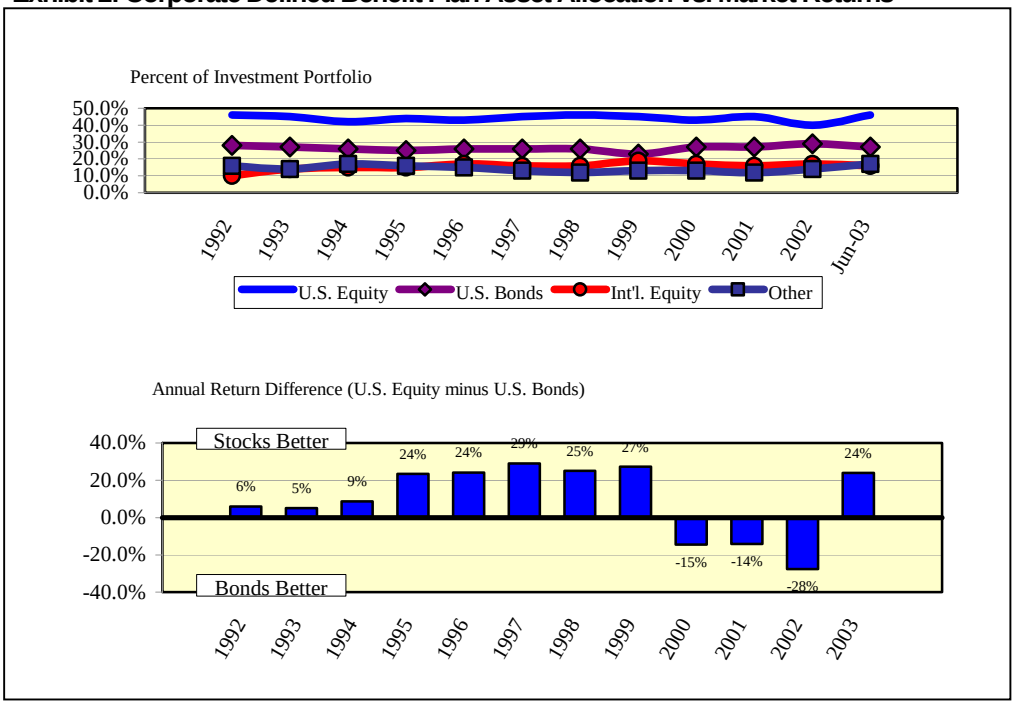
Source: Hewitt Associates

What Have Defined Benefit Plans Earned vs. Their Return on Asset (ROA) Assumptions?

Median DB plan 10-year return (through December 31, 2003) = 9.4%
Estimated average ROA assumption over same period = 8.8%
Sources: Mellon Pension Trust Universe and CIEBA

Achieving these returns is the primary result of exceptionally stable and disciplined investing, using U.S. equity as the Trust's primary investment asset class.

Exhibit 2: Corporate Defined Benefit Plan Asset Allocation vs. Market Returns



Sources: (Top Chart) CIEBA Annual Membership Profiles; (Bottom Chart) CIEBA, based on data from the Federal Reserve

How Have Defined Benefit Plans Performed vs. the Average Individual Investor?

Median 17-year return (through December 31, 2000) = 13.1%
Average individual investor return for same period = 5.2%
Sources: Mellon Pension Trust Universe and the Dalbar study

Employees invested in a typical DC plan during the period 2000-2002 experienced a significant reduction in their portfolio's value and thus, their benefit.

One of the reasons plans tend to hold equity investments is that equity risk generally diminishes as holding periods increase. Exhibit 3 demonstrates that historical fact, using various time horizons and expected risk premium associated with equity investment.

For example, the standard deviation of real equity returns declines from 5.9% to 1.5% as the time period expands from 10 to 30 years. In addition, the risk of realizing a real annualized return of less than 3.5% drops from 37% to 10% over those two periods (assuming that stocks outperform bonds by 2% per year). Over the same period, the risk of a real return below inflation (e.g., below 0%) declines from 18% to 0%.

Exhibit 3: Expected Excess Return on Equity

Holding Period	Standard Deviation*	Expected Excess Return on Equity	Risk of Real Annualized Returns Below 3.5%	Risk of Real Returns Below 0%
10 Years	5.9	1%	43%	22%
		2	37	18
		3	31	14
20 Years	3.3	1	38	8
		2	27	5
		3	18	2
30 Years	1.5	1	26	0
		2	10	0
		3	3	0
40 Years	1.4	1	24	0
		2	8	0
		3	2	0

* Standard deviation of annualized real equity market returns over the holding period
Source: Robert Shiller; Goldman, Sachs

Defined Benefit Plans Also Protect Employees From a Host of Additional, Long-Term Risks

Hewitt Associates

- Annuities reduce the risk of longevity/aging, reducing the likelihood that individuals will outlive their resources.
- In plans that provide early retirement subsidies, the less healthy can retire as necessary, without a large penalty (reduced morbidity risk).
- Inflation risk is eliminated during employment by final average pay or inflation-adjusted, flat-dollar plans. Inflation risk may also be reduced by traditional pension plans providing ad hoc Cost of Living Adjustments (COLAs) after retirement.

Historically, U.S. Corporations Have Supported the Defined Benefit System

Hewitt Associates

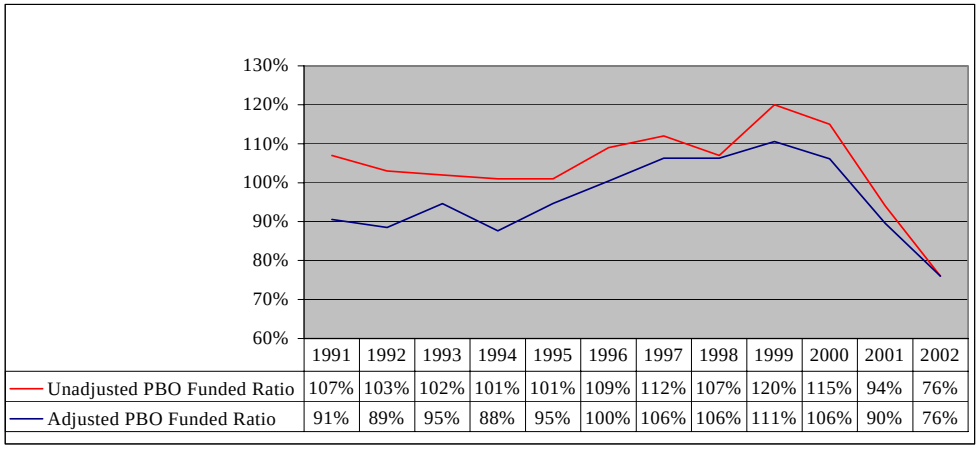
- Although the number of DB plans declined dramatically over the past decade, that decline stems almost exclusively from the exit of very *small* companies (due to perceptions of excessive regulatory requirements), and the consolidation of plans by larger employers. To date, very few *large* sponsors of corporate DB plans have exited the system.
- While the percentage of companies in the Fortune 500 with DB plans has declined from 90% in 1991 to 75% today, the actual number of participants covered increased from 31 to 35 million.
- Companies have tried to respond to changing conditions, such as a more mobile workforce, by introducing hybrid plans that better match the current workforce and better suit corporate needs.

What's New Today?

Hewitt Associates

- Many observers feel that current conditions are likely to cause many employers to exit the DB system. Some have already begun to freeze future benefit accruals.
- Unprecedented financial market conditions have lowered the funded status of many corporate plans, increased pension expense and caused some companies to contribute large sums to support their pension programs. Many observers have called the 2000-2002 period the "perfect storm."
- Interest rates, both nominal and real, are at or near 50-year lows. The yield curve is at, or near, as steep as it has ever been. Short-term rates are below inflation.
- Tightened funding rules adopted in the late 1980s have caused a large cash call on many companies, just at a time when cash is in short supply.
- There has been unusual uncertainty injected into the future of the funding rules, as Congress has not finished work on the discount rate. The accounting profession is "piling on," suggesting changes that could increase the volatility of corporate earnings substantially.
- The PBGC is openly campaigning for additional reform.
- The aggregate U.S. pension system is maturing. In 1990, the ratio of the PBO to the Accumulated Benefit Obligation (ABO) was 125%. Today, it is approximately 107%. In 1985, the ratio of active employees to inactive plan participants (primarily retirees) was approximately 80/20. Today, that ratio is approximately 50/50. In the future, retirees are virtually certain to outnumber active employees *[See Exhibit 6.]*.

Exhibit 4: Assets as a Percent of Projected Benefit Obligations (PBO)



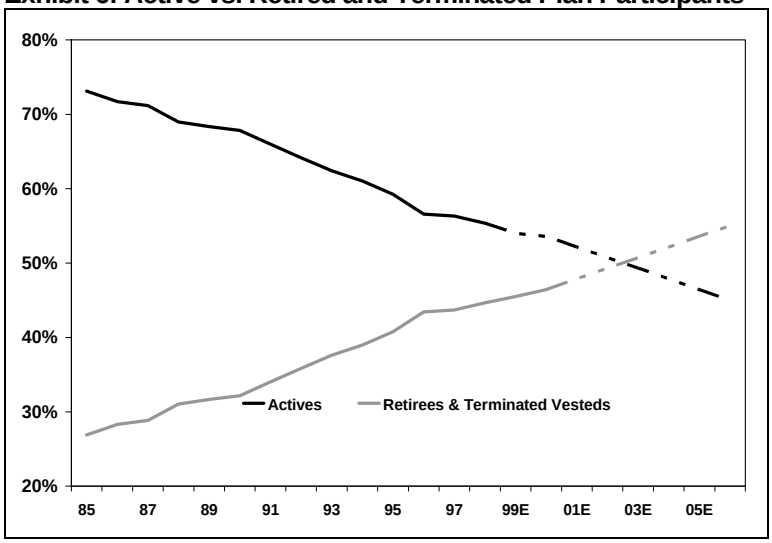
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Unadjusted PBO Funded Ratio	107%	103%	102%	101%	101%	109%	112%	107%	120%	115%	94%	76%
Adjusted PBO Funded Ratio	91%	89%	95%	88%	95%	100%	106%	106%	111%	106%	90%	76%

Source: Hewitt Associates

Exhibit 5: 10-Year U.S. Treasury Bond Yield

Source: CIEBA

Exhibit 6: Active vs. Retired and Terminated Plan Participants



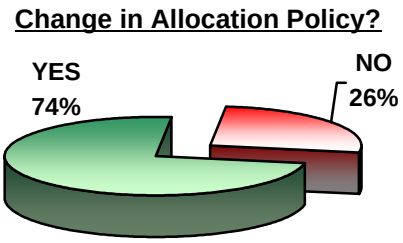
"E" along the horizontal axis means "estimated."
Source: Morgan Stanley

Corporate DB pension plan sponsors' reactions to these emerging issues are likely to be significant and swift.

Seventy-five percent of plan sponsors who participated in the *CIEBA Survey on Emerging Issues* are likely to respond by making significant changes to their asset allocations, principally by lowering long-term equity holdings by approximately 15% and re-investing the proceeds in long-term bonds. Assuming reasonable follow-on effects, this could represent a shift of up to $650 billion for the extended system. (This does not take into account the likely, additional flows created by information-based, short-term trades [e.g., hedge funds, etc.].)

Exhibit 7 summarizes the expected asset allocation response of major U.S. corporations to the collective impact of the emerging pension issues.

Exhibit 7: Collective Impact on Asset Allocation of Emerging Issues



If Yes:	
Reduce Equity	100%
Increase Equity	0%
How Much?	
< 5%	22%
6% - 10%	15%
11% - 15%	22%
16% - 20%	11%
> 20%	30%
All Bonds?	
Unlikely	71%
Possible	22%
Very Likely	7%
Impact on Duration Policy?	
No	53%
Yes*	47%
*100% would increase duration	

Source: *CIEBA Survey on Emerging Issues*

Exhibit 8: Projected Hierarchy of Individual Issue Impact

	Asset Allocation Action	
Individual Issue	No Change	Change
1. FASB Elimination of Smoothing	55%	45%
2. Treasury Requires Corporate Yield Curve	55%	45%
3. PBGC Alters Premium System	51%	49%
4. Discount Rate Becomes Single Long-Term Corporate Rate	98%	2%
5. Rating Agencies Treat PBO as Debt	67%	33%
6. Broad Adoption of S&P's Redefinition of Core Earnings	71%	29%
7. FASB Requirement to Increase Disclosure	92%	8%

Approximately 50% of plan sponsors in the CIEBA survey indicated they would also consider a reduction in benefits offered (e.g., a discontinuation of future accruals for existing participants, elimination of benefits for future employees, migration toward hybrid plans and, for some, the complete elimination of their DB system).

Exhibit 9: Collective Impact on Benefit Structure

Benefit Change	Unlikely	Possible	Very Likely
1. Freeze Accruals to Existing Entrants	53%	38%	9%
2. Freeze Entry of New Participants	47%	32%	21%
3. Switch to Cash Balance Plan	61%	28%	11%

Summary Statements by Various Independent Experts

The following are highlighted statements made by various experts whom CIEBA sought out to offer commentary on emerging pension issues. Subsequent pages of the report contain their more specific responses.

Goldman, Sachs
At the margin, the proposed changes will exacerbate the decline in the U.S. defined benefit system … significantly increase the burden on households in their retirement planning (via a massive shift in investment risk to individuals) … and increase the risk that many individuals will outlive their assets.

Morgan Stanley
Proposed changes "would kill the patient if applied as shock treatment," … but retaining the status quo would inevitably condemn the patient to death, so doing nothing is not a good alternative.

If implemented abruptly, five of the seven missiles … might result in significant changes to asset allocation and/or lead to plan freezing, outcomes that would sound the death knell for the defined benefit concept.

Hewitt
The voluntary private employer defined benefit pension system in the United States is under attack. Current legislative and regulatory proposals, as well as recent judicial rulings and potential accounting changes, are forcing employers to question their ongoing commitment to these plans.

At the heart of the matter is the balance between short and long-term goals. If pension funding must be viewed on a long-term basis with severe limitations and penalties for over funding, but simultaneously, on a short-term basis using market related measures, employers cannot manage the challenges.

Bridgewater
The current interest rate structure is extreme, potentially overstating long-term pension liabilities.

A move to a full mark-to-market approach using the yield curve would work against both Federal Reserve and fiscal policy objectives with little or no gain in the accuracy of the long-term pension liability estimate.

Macroeconomic Analysis: Potential Implications of the Implementation of Emerging Pension Issues

Armed with the CIEBA data set out previously, senior economists and pension analysts at Goldman, Sachs and Morgan Stanley estimated the potential impacts of emerging pension issues on the economy, employment, financial markets and pension funded status. Their findings, along with commentary from CIEBA, are set out below.

Projected Impact on U.S. GDP Growth

Goldman, Sachs	**Morgan Stanley**
▪ Limited (using Fed. Reserve data)	▪ Reduces real GDP growth by between 0.3% and 0.5%/year between 2005 and 2007

Projected Impact on U.S. Employment

Goldman, Sachs	**Morgan Stanley**
▪ Undetermined	▪ Raises the unemployment rate by 0.2-0.3% per year between 2005 and 2007 ▪ Implies that between 290,00 and 440,000 jobs will be lost

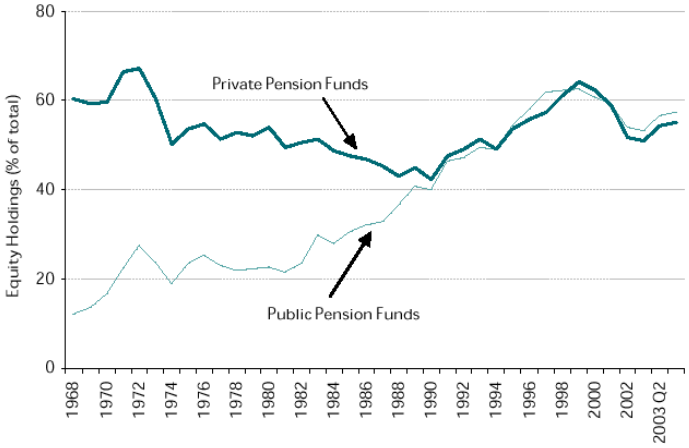
Unless an assumption is made that corporations will simply absorb the increased costs associated with these changes, corporations will have only three significant ways to respond. They can reduce: 1) compensation/benefits for current employees, 2) employment or 3) capital spending.

Adoption of some or all of the emerging issues would weaken the public's safety net. Closing DB plans would probably force the savings rate to rise, shifting capital away from consumption.

Projected Impact on the U.S. Stock Market

Goldman, Sachs	**Morgan Stanley**
▪ Down 1-2% ▪ Corporate DB only; no follow-on effect assumed ▪ Asset flow: $250 billion ▪ Less equity issuance ▪ No estimate is made regarding potential short-term trading/hedge fund effects (overshoot)	▪ Down 8-12% ▪ Includes likely follow-on effects ▪ Implies approximately a loss of $1.2 trillion ▪ Asset flow: $650 billion ▪ No estimate is made regarding potential short-term trading/hedge fund effects (overshoot)

Exhibit 10: Percent Equity Holdings of U.S. Public and Private Pension Plans



Source: Goldman, Sachs, Equity Derivatives Strategy

While Goldman, Sachs and Morgan Stanley support a significant, but undefined, continued level of equity commitment, they remain fairly sanguine about the long-term outlook for U.S. stocks and bonds. Goldman, Sachs believes that the Equity Risk Premium (ERP) for the next 10 years will be well below normal. Morgan Stanley makes repeated statements along the following lines: "The status quo would inevitably condemn the patient to death" and "in our view further improvements in the equity markets would require implausible earnings growth."

If the stock market declines by 10%, $1.2 trillion will be lost (at least temporarily). Furthermore, considering the proximity of this regulatory/accounting-driven decline, it is probably reasonable to assume that this could be the proverbial "nail in the coffin" for the typical small individual investor.

Both Morgan Stanley and Goldman, Sachs cite a study saying the pension system meaningfully distorted the equity bubble. As the bubble was primarily in technology and emerging telecom, both areas heralded for their lack of DB plans, the Morgan Stanley and Goldman, Sachs conclusions may be incorrect.

- Private pensions were net sellers of stock during the bubble.
- Public pensions were net buyers.

Equity risk premiums are driven significantly by perceived relative volatility. Morgan Stanley estimates that the mark-to-market proposal would have increased the downward effect on earnings during 2002 by a weighted average of 67% (median of 27%).

At the center of this debate sits the question of whether U.S. pension systems should rely on the long-term ERP and whether the pension system should organize itself around a worst-case planning process or use a more central scenario.

Almost everyone believes that the odds of a professionally run, long-term, equity-oriented program outperforming a portfolio of high-quality bonds are high, albeit not 100%. Historically, that margin has been fairly significant. There are some who now believe the equity risk premium, while positive, will be below the historical norm.

Goldman, Sachs (and Robert Shiller) states that if you assume a 2% ERP (historically low), then the odds of equities beating bonds (at a 3.5% real return) are 2-to-1 over 10 years; 4-to-1 over 20 years; and 97% over 30 years. Obviously, assumptions that the ERP will be closer to the long-term historical norm improve these odds considerably.

Should the new framework force companies to shift their asset mix toward bonds, it is essentially a move *away* from central scenario, long-term planning, and *toward* worst-case, short-term scenario planning. The result is likely to be a decrease the short-term variability of the system and an increase in its long-term cost. As Goldman, Sachs says in its report, "there is no free lunch."

Projected Impact on Interest Rates

Goldman, Sachs	**Morgan Stanley**
▪ Decrease rates by 10-30 basis points ▪ Without follow-on effects ▪ Flatten yield curve slightly	▪ Decrease interest rates by 40-120 basis points ▪ Including follow-on effects ▪ Flatten yield curve

Morgan Stanley's report implies that the intermediate term effect on U.S. bond returns would be slightly positive for the typical investor. If rates fell by 50 basis points, intermediate-term bond holders would see their short-term return improve by about 25 basis points (over about a 4% starting return), while longer duration investors would see their returns increase by 50 basis points (for those already invested).

Bill Gross, chief investor officer of PIMCO, is on record as saying that it is very likely that the 20-year bull market in bonds recently ended. If that is true, rates should begin to rise on a secular basis.

Global economic and monetary policies seek to stimulate economic activity, and are thereby, at the margin, generally reflationary.

Analysis of Long-Term Interest Rate Cycles and Current Rates (Bridgewater)
▪ Interest rates move with the economic cycle. ▪ If rates revert to the average of just the past 10 years, they will rise 2-3% (implying that this factor alone will cause the Present Value [PV] of pension liabilities to decline 20-30%). ▪ A significant portion of the recent fall in rates did not result from declines in real, expected future inflation. In fact, current real rates may be excessively low for that reason (50 basis point, or more [e.g., potentially overshoot]). ▪ Current "forward rates" are projecting an increase in interest rates over an intermediate-term horizon.

Aa Rate Footnote (Morgan Stanley)
▪ Should a large number of plans decide to simultaneously and significantly increase both their allocations to corporate bonds and their durations, there would be a "major scramble for duration." ▪ The current supply of liquid, long-duration corporate bond paper may prove inadequate. ▪ The change could offset some likely flattening of the yield curve. ▪ If these proposals are implemented, Treasury's debt managers might see an opening in which to resume bond issuance. ▪ With the spread between 10- and 30-year yields near record levels (100 basis points, plus/minus), issuing bonds would be expensive and counter-productive for the U.S. Treasury.

Projected Impact on Corporations Due to Rating Agency Treatment

Goldman, Sachs	Morgan Stanley
▪ No comments	▪ Lagged effect likely

Projected Impact on the Current Pension Funding Scenario of Asset Allocation Changes

The immediate impact is likely to further reduce current pension funding ratios via a declining stock market and falling interest rates.

Over the short run, the annual investment portfolio volatility would be reduced (assuming 15% of the equity portfolio were re-allocated to bonds), as would the long-term expected return.

Over the long run, the cost of U.S. DB pension systems would increase to offset the relative return shortfall, or corresponding benefit reductions would be required.

Goldman, Sachs	Morgan Stanley
▪ PBO funded status will deteriorate by 2-3% ▪ Return and interest rate assumptions listed above ▪ Assuming an asset mix of 70% equity, 25% bonds (duration of 5 years) and 5% cash ▪ Liability duration: 10 years	▪ PBO funded status will deteriorate by more than 10% ▪ Return and interest rate assumptions listed above ▪ Assuming an asset mix of 70% equity, 25% bonds (duration of 5 years) and 5% cash ▪ Liability duration: 10 years

Many companies would be hit hard by a further deterioration of 5%, 10% and 15% in the funded status of their pension systems.

Analysis and Comments on Individual Emerging Pension Initiatives

CIEBA also requested an individual assessment, and, wherever possible, an evaluation of the emerging pension issues by Bridgewater, Morgan Stanley, Hewitt Associates and Goldman, Sachs. Summarized below are those responses.

Elimination of Smoothing (FASB)

This initiative was listed by plan sponsors responding to the CIEBA survey as one of the two most problematic potential emerging issues. Forty-five percent of corporations indicated they would initiate a significant shift out of stocks and a corresponding reduction in benefits based on this issue alone. While this is currently not on the official docket at the U.S. FASB, it is already underway elsewhere. (Financial Reporting Standard 17 [FRS 17] was implemented in the United Kingdom.)

Goldman, Sachs	**Morgan Stanley**
▪ Goldman, Sachs opposes a system in which pension fund results flow through the income statement on a mark-to-market basis. ▪ This initiative creates greater earnings volatility, mismatches the timing of assets and liabilities, and is inconsistent with the treatment of corporate bonds (e.g., the PV change through its income statement).	▪ The adoption of a mark-to-market approach where all benefits are discounted at a single corporate bond rate and pension assets are valued at market is not the correct answer. ▪ Mark-to-market would have increased the 2002 earnings volatility for corporate America by a weighted average of 67%, with a median impact of 27%. ▪ Investors are not likely to apply a standard multiple to the mark-to-market adjustment.

FRS 17 Comments

Goldman, Sachs believes FRS 17 avoids the problems they cite via a division of pension expense into two parts: operating and financing.

FRS 17 is based on a shift from an income statement to a statement of comprehensive income.

Sir David Tweedy crafted this U.K. process and now heads the International Accounting Standards Board (IASB).

FRS 17 is controversial in many other countries.

A case study on the U.K. pension system following implementation of FRS 17 seems to verify the survey results for U.S. plans cited above. Specifically, their equity allocation is down 8-10% (Goldman, Sachs study) and benefits have been reduced at many companies.

Treasury Requires an Unsmoothed Corporate Yield Curve (for Funding Calculations)

This is one of the two most problematic potential emerging issues for plan sponsors responding to CIEBA's survey, 45% of whom indicated they would significantly alter their asset allocation and potentially also reduce pension benefits based on this issue alone. Treasury's proposal to move from a smoothed long-term rate to an unsmoothed Aa yield curve includes a transition period beginning in two or three years, with full phase-in by the fifth year. This initiative is likely to impact mature pension plans with older workers most.

Analysis of Yield Curve Proposal Implications (Bridgewater)
▪ The annual volatility of a pension liability based on an unsmoothed Aa corporate yield curve will exceed the annual volatility of a single discount rate process by 2-3x, or more. ▪ Increased short-term volatility will <u>not</u> improve the accuracy of the going concern pension valuation. In fact, the five-year correlation of the yield curve-based estimate has a correlation of only 0.2 with what actually happens. ▪ Using a yield curve will subject a significant portion of the long-term valuation of pension liabilities to a single entity – the Federal Reserve. This will happen because of its virtual monopoly on the short-end of the yield curve. ▪ While the Fed properly uses its latitude over short-term rates to achieve one of its two goals (stimulate growth or contain inflation), the short-term effect is harmful to pension liability valuations (e.g., it distorts them upward during recessions and downward during expansions). ▪ This unintended effect will prove to work against the realization of the Fed's overall goals. It will do so by causing corporations to use too much cash on pensions during periods when the Fed is trying to generate growth, and then too little on pensions when it seeks to contain inflation.

Goldman, Sachs	**Morgan Stanley**
▪ The current steepness of the yield curve would tend to result in a higher present value when using a full yield curve. ▪ The calculation is feasible, but complex. ▪ Undecided – Conclusion would be resolved by evaluating the increased accuracy (if any) relative to the increased complexity.	▪ The strength of the negative reaction by corporations is a surprise to Morgan Stanley. ▪ They believe that it "suggests a significant (short-term?) duration mismatch that will be highlighted by the use of a full yield curve." ▪ If so, the use of a single corporate bond rate "could be disastrous for many of the DB plans if the markets do not provide very healthy returns over the next several years, hardly a riskless call."

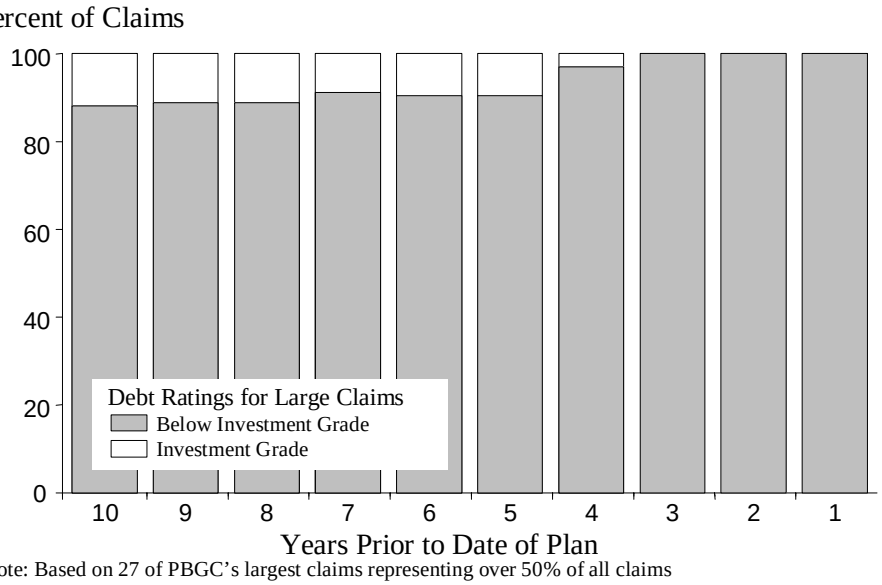
Pension Benefit Guaranty Corporation (PBGC) Alters Risk Premium System

The current system relies on the participation and support of all companies sponsoring DB plans. Fifty-one percent of companies in the CIEBA survey indicated that the premium change cited would significantly impact their asset mix, while reducing their overall enthusiasm for the entire system. Currently, premiums are based on the number of participants and the amount of underfunding.

The PBGC, along with a number of academics, informally floated a proposal to alter the system and charge premiums based on equity exposure, regardless of funded status or the sponsoring corporation's financial health.

However, the threat of failure for most underfunded pension plans has been exaggerated. According to the Federal Reserve, 90% of pension underfunding at the end of 2002 was associated with companies with a high quality rating.

Exhibit 11: PBGC Losses in Comparison to Credit Ratings

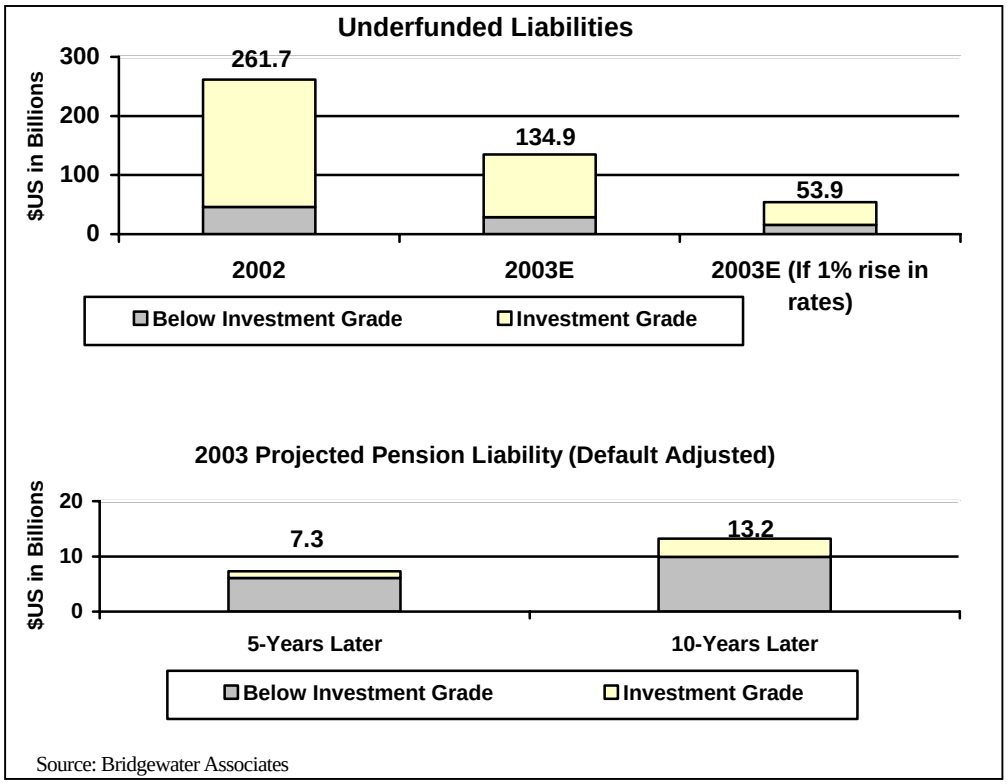


Note: Based on 27 of PBGC's largest claims representing over 50% of all claims
Source: Pension Benefit Guarantee Corporation

Historical Footnote on the PBGC (Hewitt Associates)

- The PBGC was an afterthought in the ERISA deliberations.
- Arguably, it has had the greatest impact on funding and employer obligations because it added a pension "right" that clearly survived plan termination and extended beyond the assets of the Trust.
- The PBGC had various unforeseen effects including serving as an impetus for FAS 87 (using a relatively short amortization period and the recognition of a balance sheet liability), and the view that the government should "protect the PBGC at any cost."
- The PBGC also impacted funding rules in many ways over the years.
- The PBGC set the stage for the so-called "perfect storm" of the past few years and much of the current panic about pension funding.

Exhibit 12: Underfunded Pension Liability Estimates and Projected Defaults



Source: Bridgewater Associates

Goldman, Sachs	Morgan Stanley
▪ PBGC's proposal is misguided. ▪ It might make more sense to base the premium system on a combination of the corporate debt rating and the adequacy of the pension assets. ▪ To do anything more should require that the PBGC demonstrate its loss is linked to the equity proportion of the pension fund's assets *after* taking into account the adequacy of the fund's assets and the credit rating of the company.	▪ PBGC proposal to base premiums solely on equity exposure is inappropriate. ▪ A more comprehensive risk-based system could be considered, and might be appropriate. ▪ "The only reason that we can see why these companies would not want the PBGC to have risk-based pricing is that they do not want to rock the boat and force more companies to take the option of putting the problem to the PBGC, thereby forcing them to incur the cost anyway."

Discount Rate Becomes a Single, Long-Term (Smoothed) Corporate Rate

Legislation is moving through Congress to replace temporarily the smoothed 30-year Treasury rate with a smoothed Aa corporate rate for calculating plan liabilities and PBGC premiums.

If the bill is enacted, it will go into effect for 2004 and 2005. Since Congress has not acted, corporations are unsure of what their funding will be going forward. Many have proposed making the corporate rate the permanent discount rate. U.S. plan sponsors have favored this proposal for

many years, and 98% believe it will allow them to continue their current long-term, equity-oriented investment programs.

The maximum allowable discount rate for calculating required minimum funding dropped from 120% of a smoothed 30-year Treasury yield to 105% at the beginning of 2004. Today, that means a drop from 6.3% under the old 120% rule to 5.5% (105%). This very low rate forces many companies to contribute unrealistically large amounts to their plans. If legislation is enacted allowing the use of a smoothed Aa corporate rate, the discount rate would be about 6.4% (Sources: Internal Revenue Service and the ERISA Industry Committee).

Impact on Lump Sum Calculations

The current mismatch in the rate used to calculate lump sums, and that used to value the full liability stream for general accounting purposes, is hurting the funded status of corporate DB plans. Further, the mismatch makes lump sums more valuable than annuities. As such, retiring participants are encouraged to take lump sum payouts, foregoing any spousal protection and leaving them vulnerable to the risk of outliving their resources.

Broad Redefinition of Core Earnings by Standard and Poor's (S&P)

The new definition treats pension gains and losses asymmetrically by allowing return on plan assets to be used only to offset interest costs. Excess return over interest costs cannot be recognized. In the CIEBA survey, only 29% of plan sponsors deemed this an important issue.

Goldman, Sachs	Morgan Stanley
▪ Has received mixed reviews ▪ Not currently an important factor in equity price determination	▪ Sponsors correctly dismissed the core earnings issue. ▪ S&P clearly created a measure with little economic logic. ▪ This initiative is largely ignored by investors.

Financial Accounting Standards Board's (FASB) Requirement to Increase Disclosure

Although significant changes to disclosure requirements were adopted in December 2003, sponsors are relatively unconcerned (92% indicated no change in the CIEBA survey). Increased disclosures include a breakdown of plan assets by broad category, corresponding expected rates of return, and schedules of employer contributions and benefit payments.

Goldman, Sachs	Morgan Stanley
▪ Favors the basic proposal if requirements actually help investors without creating excessive burdens ▪ Expects compliance for non-U.S. plans to prove difficult	▪ Believes the new disclosures of asset allocation alone will have some impact, as some may find it difficult to justify a high ROA assumption ▪ Expects the removal of financing income from operating income will eliminate one incentive for the current levels of equity exposure

Other Major Points

The large contribution from corporate DB plans to the nation's system of retirement financing needs to be much more widely appreciated. [*See Hewitt Associates LLC Paper*.] A strong system has four strong components: Social Security and DB plans for core/stable long-term retirement planning; and DC and private investments for personal/flexible components. DC plans transfer significant, long-term risk to the individual. Increased appreciation for the fact that lower income employees do not fully participate in DC plans is also needed. In total, only 76% of employees participate in their DC plans at all.

There is also evidence that many individuals fare relatively poorly when investing personally. The Dalbar study cites a very poor track record by most individual stock market investors. Specifically, while the S&P 500 earned 16.3% per year from 1984 through 2000, the typical equity-oriented mutual fund investor earned under 5.2%, often due to excessive and ineffective trading.

General Conclusion

This report illustrates the dangers posed by a number of proposed reforms to the future retirement security of millions of Americans. According to the survey findings, approximately 50% of plan sponsors would cut, or freeze their plans should the proposals be enacted. This would leave the retirement income of millions of people in jeopardy, and place even greater pressure on government programs to make up the difference at a time when these programs are under increasing stress. Rather than making the nation's retirement system more secure, as they purport to do, the proposed pension rules and regulations will make it less so.

The full report highlights the need for all stakeholders in pension policy – legislators, regulators, standard setters, plan sponsors, and participants – to consider all aspects of these proposed changes and to coordinate individual and/or collective responses to perceived problems in the system. It also underscores the hazards of making major changes to address short-term, temporary circumstances that weaken the system over the long term.

Consistent with the principles outlined earlier in the report, CIEBA believes that three of the seven initiatives discussed in this report should be rejected outright. These proposals – the elimination of smoothing, requiring the use of a corporate yield curve for funding purposes and basing Pension Benefit Guaranty Corporation (PBGC) risk premiums on portfolio equity exposure, exclusive of other factors – cause pension plan sponsors to shift their pension investments away from long-term equity holdings in favor of greater fixed income exposure. Such a shift makes plans much more expensive, leading a large number of plan sponsors to freeze, cut or abolish corporate pension benefits for millions of American workers. As detailed in the report, these initiatives may also exclude millions of younger workers from these benefits entirely.

Several other proposals, coming from the rating agency community and including redefining core earnings and treating pension obligations as debt on corporate balance sheets, do not appear to have a large impact on the investment behavior of corporate plan sponsors. However, these changes focus on short-term factors and do not recognize the long-term nature of pension plan commitments.

Two of the emerging issues are viewed more favorably by CIEBA. Plan sponsors are supportive of the new pension plan disclosures instituted by the Financial Accounting Standards Board (FASB) in December 2003. CIEBA's "*Guiding Principles Governing Defined Benefit Plans,"* located on page 8, endorses disclosures that make plans more transparent and provide investors with relevant information.

CIEBA strongly supports efforts to rationalize funding calculations by using a discount rate based on a high-quality (Aa or better), longer-term corporate bond index. CIEBA believes this is the

appropriate rate for calculating minimum funding because it mirrors the rate of return on insurance company annuity investment portfolios.

CIEBA believes that an overall review of the funding rules and the regulatory regime that governs defined benefit plans is necessary and desirable. However, this report makes clear that proposed changes must be considered in a comprehensive way.

Legislators, regulators and standard setters need to acknowledge that healthy pension reform must be broadly coordinated. CIEBA calls on them to meet together with representatives of plan sponsors and participants to develop a blueprint for considering pension reforms that takes into account the interaction and (positive and negative) impacts of possible changes.

U.S. corporate pensions are too important to the nation to rush to judgment and implement these disparate, and inadequately considered, fundamental changes. DB plans are a key part of our nation's retirement system. No action should be taken that undermines their continuation and maintenance. We must not put the dignified retirement of millions of Americans at risk.

Appendices

Appendix A

List of Participants on CIEBA Project

T. Britton Harris, CIEBA Vice Chairman and President, Verizon Investment Management Corp.

Gary A. Glynn, CIEBA Chairman and President, U. S. Steel and Carnegie Pension Fund

Joe Grills, (retired), CIEBA Chairman emeritus

William F. Quinn, President, AMR Investment Service Inc.

Allan Reed, President and CEO, General Motors Assets Management

Judy Schub, Managing Director, CIEBA

Ronald A. Walters, Executive Vice President, Citigroup Investments, Inc.

Amy Wu, Associate, Verizon Investment Management Corp.

List of Experts on CIEBA Project

Richard Berner, Chief U.S. Economist, Morgan Stanley

William Dudley, Chief U.S. Economist, Goldman, Sachs & Co.

Trevor Harris, Head of Global Valuation and Accounting, Morgan Stanley

Ari Jacobs, East Region Retirement Practice Manager, Hewitt Associates LLC

Michael Johnston, National Practice Leader, Retirement, Hewitt Associates LLC

Michael Moran, Vice President, Goldman, Sachs & Co.

Robert Prince, Co-Chief Investment Officer, Bridgewater Associates

Appendix B: Goldman, Sachs & Co. Paper

See attachment titled:
Corporate Defined Benefit Plans: The Potential Consequences of Current Reform Initiatives

Appendix C: Morgan Stanley Paper

See attachment titled: *Pension Missiles*: Is the Cure Worse than the Disease?

Appendix D: Hewitt Associates LLC Paper

See attachment titled: *Response to CIEBA Request for Impact Analysis of Emerging Issues*

Appendix E: Bridgewater Associates Papers

See attachment titled: *Interest Rate Dynamics in the Context of Pension Fund Liability Valuation*

See attachment titled: *Pension Fund Missiles Project: Source of Yield Data*

Goldman Sachs

Corporate Defined Benefit Plans: *The Potential Consequences of Current Reform Initiatives*

Asset and Liability Volatility Increases Regulatory Scrutiny

Reform Initiatives Would Generally Make Equities Less Attractive

Plans Would Respond by Cutting Equity Allocation, Extending Bond Duration

Portfolio Shifts Not Big Enough to Have a Large Impact on Equity and Bond Prices

William C. Dudley
Michael A. Moran, CFA
November 14, 2003
(Revised March 15, 2004)

Highlights/Summary[1]

In recent years, the decline in equity prices (lowering the value of fund assets) and the fall in bond yields (increasing the present value of fund liabilities) have pushed many corporate defined benefit plans from overfunded to underfunded status. This, in turn, has increased the focus on the accounting and funding rules associated with these plans.

A number of reform initiatives have surfaced. These include: (1) changing a key discount rate for funding purposes to the yield on a corporate bond index from a yield based on the 30-year US Treasury bond, (2) using the yield curve to match the discount rate to the duration of the liabilities for funding purposes, (3) improving disclosure rules, (4) elimination of smoothing and the imposition of mark-to-market accounting for pension fund assets and liabilities, (5) the imposition of risk-adjusted premiums by the Pension Benefit Guaranty Corporation (PBGC) based on the proportion of equities of total plan assets, (6) treating the pension benefit obligation (PBO) as debt for credit rating purposes, and (7) the use of core earnings by Standard and Poor's, which treats pension fund gains and losses asymmetrically.

If such initiatives were enacted, the short-term volatility of equity prices would be more fully reflected in the calculation of fund liabilities and assets. As a result, defined benefit plans would likely reduce the proportion of fund assets invested in equities and increase the proportion in fixed income investments. Fund managers would also be likely to extend the duration of their bond investments in order to more closely match the duration of fund assets and liabilities.

If all the initiatives were enacted, the shift in asset mix for corporate defined benefit plans could be substantial. However, the consequence of these shifts in asset allocation would be modest for the overall equity and bond market because corporate defined benefit plan holdings of stocks and bonds represent a small share of the aggregate equity and bond market. As a result, these shifts would likely have only modest effects on equity prices and long-term interest rates.

The shift would also tend to drive up funding costs as the expected return on corporate bonds would be lower than the expected return on equities. This could be expected to have an impact on profits, employment, wages, and employee benefits.

There is no free lunch. Equities and alternative investments are more risky than bonds. That is why they have higher expected returns. The current regulatory regime masks this riskiness to some extent, encouraging greater investment in corporate equities and alternative investments by defined benefit plan sponsors. If the goal is to reduce the potential for large asset/liability imbalances, then the assets and liabilities of pension funds must be better matched. This implies a shift away from equity investment, slightly lower pension fund returns, and slightly higher contributions into these defined benefit plans.

[1] This paper was written at the request of the Committee on Investment of Employee Benefit Assets (CIEBA). CIEBA asked Goldman Sachs (and others) to assess the likely impact of the new regulatory and accounting initiatives on corporate defined benefit plans if those initiatives were, in fact, enacted. CIEBA conducted an in-depth survey of its membership. That survey was a critical source of information for this study.

The proposed changes would exacerbate the decline in the defined benefit pension system. This would be unfortunate because the continued shift to defined contribution plans significantly increases the burden on households in their retirement planning. Under a defined benefit plan framework, corporations, backstopped by the PBGC—funded by premium income from plan sponsors—typically guarantee a fixed monthly retirement benefit. This shifts the investment risk from the individual to the plan sponsor. It also reduces the risk of an individual outliving his or her financial assets under the defined contribution plan framework.

The Problem

Corporate defined benefit pension plans have become a focus of attention in recent years. A host of issues has been identified including:

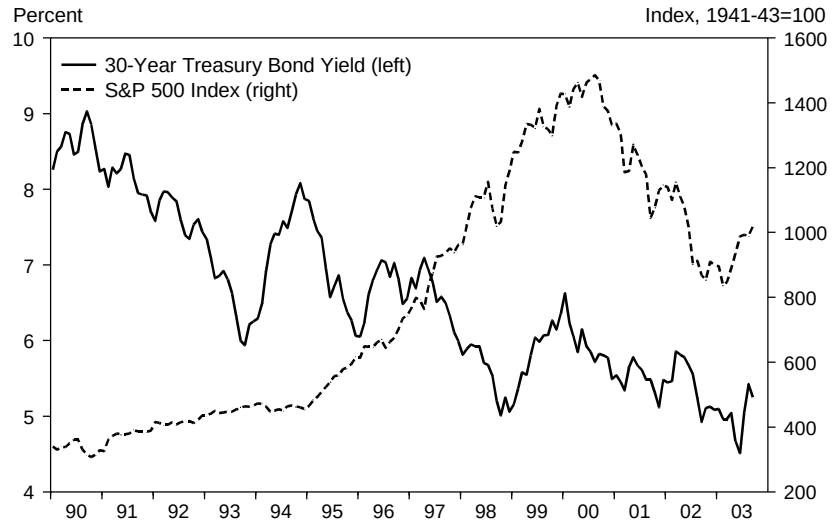
1. **Many plans are now underfunded.** However, these problems tend to be highly concentrated in a few industries and companies. The present value of some plans' liabilities—already incurred (ABO) or projected (PBO)—are significantly above the funds' assets. The gap, in fact, on a funding basis is probably even bigger than the reported GAAP figures suggest because the present value of liabilities is currently understated. That is because most plans use a smoothed discount rate to calculate the present value of liabilities for funding purposes (calculation of the pension liability for accounting purposes under FAS 87 uses a non-smoothed rate). When interest rates have persistently fallen, as has been the case over the past few years, this smoothed rate is substantially above the spot rate, leading to an understatement of liabilities. However, the application is symmetrical, and in a period of rising interest rates the smoothed rate is below the spot rate. In this case, liabilities for funding purposes would be overstated.
2. **The exposure of the Pension Benefit Guaranty Corporation has increased as plans have become underfunded and the health of certain corporate sectors—especially the airline, auto, and steel industries—has deteriorated.** The fact that premium assessments are not explicitly tied to the expected losses likely to be incurred by the PBGC creates a moral hazard problem.
3. **The accounting rules that allow assumed pension fund returns to influence reported corporate earnings increases the volatility of this measure of profits.**
4. **Actuarial assumptions as to the prospective return on a diversified portfolio of corporate equities and bonds may be unrealistically high for some companies.** Actuarial expected return assumptions have been reduced in recent years. However, some companies, especially those using expected return assumptions of 9% or higher, probably need to revise them down further. The use of an unrealistically high expected return assumption causes corporate earnings to be overstated.

The underlying problem is the volatility of the value of pension fund assets versus the present value of the plans' liabilities. This creates sharp swings in terms of the adequacy of pension fund assets relative to liabilities when measured at a particular point in time. In recent years, the corporate sector has moved sharply from overfunded to underfunded status.

On the asset side, the decline has been caused mainly by the large drop in the equity market since its peak in March 2000. On the liability side, the present value of liabilities has increased sharply because the discount rate used to calculate present value has declined as interest rates have fallen.

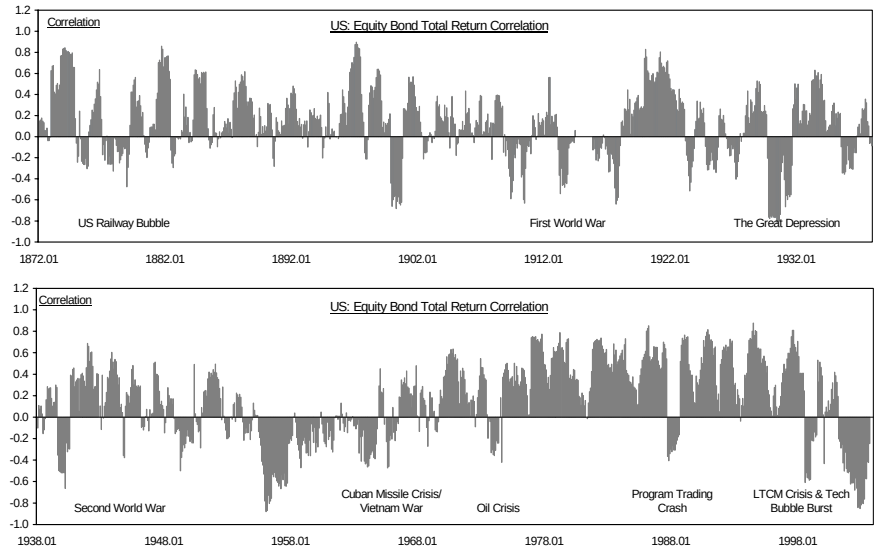
The double-whammy can be illustrated quite simply via the out-performance of bonds versus equities over the past few years (see Exhibit 1). The decline in bond yields has been raising the present value of liabilities, and the fall in equities has been pushing down the value of assets. Recently, bond market performance and stock market performance have been highly negatively correlated. Not only is this quite unusual over the past thirty years, but also past periods of negative

Exhibit 1: An Asset/Liability Squeeze: Equities Fall and Interest Rates Decline



Source: Federal Reserve Board. Standard & Poor's.

Exhibit 2: US Stock and Bond Return Correlation Shifts Sharply



12-month rolling correlation of monthly total returns. Source: Goldman Sachs, Schillers

correlation were relatively brief (see Exhibit 2). This suggests that the current squeeze caused by declining bond yields and falling equity prices is unlikely to prove persistent.[2]

Of course, if interest rates were to rise from current unusually low levels, then the present value of liabilities would shrink and this would ease the squeeze on corporate defined benefit plans. This is a reasonable expectation. After all, the fact that the yield curve is unusually steep implies that market participants expect that interest rates will rise in the future. Also, higher interest rates appear inevitable given that the monetary authorities have pushed the federal funds rate down to an

[2] See "Equities Up, Bonds Down—Simple as That?" *Goldman Sachs Global Interest Rate Strategy Group*, November 11, 2003.

unusually low level of 1% in order to push inflation higher. Once the Federal Reserve Board succeeds in this mission, it will raise short-term interest rates and bond yields will likely rise.

The sharp swing in the value of assets versus liabilities creates two difficulties:

1. **Earnings volatility increases.**
2. **The volatility of the asset/liability gap creates volatility in required cash contributions.** The cash contribution required to fund the plans increases as the adequacy of the funds' assets deteriorates.

So what's the solution? Ideally, one would look to develop a mechanism that:

1. **Reduces the volatility of the gap between assets and liabilities.** This would reduce the volatility of cash contributions.
2. **Reduces the impact of the volatility of the pension plan on corporate earnings.** This would dampen any volatility of stock prices created by swings in pension fund assets.[3]
3. **Results in a smooth and predictable contribution schedule.** This would help companies better manage their businesses.
4. **Minimizes the size of required contributions.**

Unfortunately, some of these objectives are mutually exclusive. For example, volatility could be reduced by shifting to an immunized portfolio in which each liability was matched by an asset of the same duration. In this case, shifts in interest rates would affect the value of assets and liabilities equally, so there would be little volatility in the asset-liability gap. However, if one were to do this, then one would not be able to minimize contributions. An immunized portfolio implies an all-fixed-income portfolio. This would result in lower expected returns and, thus, over time, higher expected contributions.

With respect to the goal of reducing the impact of pension fund returns on corporate earnings, this is difficult to accomplish in practice. For example, suppose that companies calculated the cost of the increase in pension fund obligations for its employees each year (i.e., the service cost), treated it as a compensation expense, and deducted this expense from earnings. This presumably would reduce earnings volatility as this expense probably would not change sharply year-to-year. Suppose that this expense was then contributed to the pension plan. What happens if the pension plan has very good or very bad returns over a sustained period? In this case, the *ex post* cost of providing the benefit would be lower (high returns) or higher (low returns) than assumed at the time the company made the service cost deduction against income. How would the surplus or shortfall be recaptured? The problem is that the expected and actual returns generated by a pension fund's assets will diverge when the pension plan holds risky assets.

[3] See, for example, "Did Pension Plan Accounting Contribute to a Stock Market Bubble?" Julia Lynn Coronado and Steven A. Sharpe, *Economics and Finance Discussion Paper* 2003-38 (July), Federal Reserve Board.

In the final analysis, the pension fund system reflects a tension between the desire to minimize contributions by holding a significant proportion of the assets in equities, which have higher long-run expected returns, and the fact that the prices of these assets are more risky over the short term. That is precisely the reason they have higher expected returns. If the pension plan holds risky assets, then it will be subject to sharp swings in the asset-liability gap.

The key question is: How does one insulate the effect of this on corporate earnings, keep this from resulting in sharp shifts in required corporate contributions, and, at the same time, fairly represent the firm's profitability and financial condition?

Some Operational Guidelines

Although developing a comprehensive solution to the problems discussed above is beyond the scope of this paper, we do have a number of suggestions:

1. **A solution needs to be comprehensive.** One of the shortcomings of the current approach is that it is piecemeal. Changes in one area do affect other areas. For example, a change in funding rules that results in an increase to required contributions will also increase income from pension activities as plan sponsors are able to record an actuarially assumed expected return on plan assets. Thus, adjustments to the system need to be considered in a comprehensive manner.
2. **Don't flow pension fund earnings through the income statement.** There are two reasons to avoid this. First, the earnings of the pension fund are not readily accessible to the corporation. Second, allowing pension fund returns to flow through earnings increases the volatility of earnings. In addition, the fact that assumed pension fund returns can be used to bolster earnings encourages companies to maintain unrealistic actuarial rate-of-return assumptions. Companies may shift the composition of their pension fund assets into riskier asset classes in order to justify high return assumptions. For example, many pension plans have been adding alternative investments to their portfolios due to: (a) reasonably good returns generated by this asset class in recent periods, (b) low covariance with other asset classes, and (c) encouragement from pension consultants to increase the use of this asset class. However, the expected return used for this asset class is often based on this recent period when their returns were likely unsustainably high.
3. **Better disclosure and increased transparency.** Investors should be provided with the necessary information to make informed judgments about: (a) the adequacy of a corporation's pension fund assets relative to its liabilities, (b) the risk inherent in the allocation of the plan's assets at different time horizons, and (c) the impact of the pension plan on the corporation's balance sheet and income statement. On the accounting side, this is a difficult task in the current environment given the unusual complexity of pension accounting rules, regulations, and disclosure requirements. The pension funding side is even more opaque. Financial information users have little information regarding the current regulatory funding status of a pension plan (which can and usually will differ from the GAAP-funded status disclosed in the annual report) as well as future contribution requirements. The use of multiple pension plans by many companies further clouds this issue. Pension accounting rules are applied to each plan individually, but

GAAP disclosure consolidates all the plans. Pension funding rules are also applied on a plan-by-plan basis, even within the same company.

4. **Simplify smoothing techniques to make them more transparent and easier to understand.** Pension liabilities are, by definition, long-term obligations. Pension accounting and pension funding rules were developed with an understanding that because these are long-tail liabilities they should not be overly influenced by short-term events such as interest rate shifts and equity price movements that might prove to be transitory. As a result, both pension accounting and pension funding rules use smoothing techniques. However, the pervasive use of smoothing techniques does cause, at times, the smoothed figures to differ greatly from reality. Many smoothing techniques are not transparent and spread actual experience over several years. Although smoothing helps reduce earnings volatility, it contributes to larger gaps between the actual (as opposed to the reported) value of the pension plans' liabilities and the funds' assets. For example, in recent years companies have been allowed to use a four-year moving average of the 30-year Treasury bond to calculate the present value of liabilities for funding purposes. Currently, this understates the present value of liabilities significantly because the current 30-year yield is far below the four-year moving average (in a rising rate environment, the smoothed rate would be below the spot rate, resulting in an overstatement of the present value of liabilities). Smoothing actual results over extremely long time periods may also encourage corporate managements to take certain liberties with actuarial assumptions. As accounting losses related to actual experience versus actuarial assumptions may be deferred and not recognized until years later, management may have incentives to persist with aggressive assumptions in order to benefit short-term performance measures. However, given the level of scrutiny paid to accounting policies in the current environment, it is unlikely that management is taking liberties with actuarial assumptions.

5. **Risk-based PBGC premiums.** Unlike insurance companies that charge premiums based on the risk of the insured, PBGC premiums are generally based on a flat rate structure not tied explicitly to the risk of loss to the PBGC. Premiums should be risk-based. Higher quality companies with adequately funded pension plans are much less likely to fail and generate liabilities that must be assumed by the PBGC. The failure to have risk-based premiums introduces moral hazard. Companies have less incentive to keep their pension plans adequately funded because they are able to get the PBGC to assume the risk at a premium cost less than the expected cost to the PBGC.

Current Proposals

There are seven noteworthy initiatives that could result in significant changes to the pension fund accounting and contribution rules. In principle, these changes could significantly affect the willingness of companies to maintain their defined benefit plans and also could affect the composition of the plans' assets. A sharp shift in portfolio composition, in turn, could conceivably have a meaningful impact on equity and bond prices.

1. **Discount rate for funding calculations.** For plan years 2002 and 2003, companies were allowed to use a discount rate up to 120% of the yield on the four-year weighted average of 30-year Treasury-bond yields under temporary relief that was enacted in early 2002. However, without new legislation the ceiling on the discount rate will

revert to 105% for the plan year 2004. With the Treasury's decision to suspend the issuance of the 30-year bond, selection of a new discount rate benchmark makes sense. The debate is about (a) the appropriate new benchmark rate and (b) how to transition to the new rate. Failure to enact a new funding discount rate would have negative consequences for plan sponsors. Pension-related bills have been passed in both the House and the Senate that would, among other things, temporarily change the discount rate to one based on a four-year weighted average of long-term high-quality corporate bonds. This would raise the discount rate vis-à-vis the rate that would be in effect under the current rules. A House/Senate committee will now attempt to resolve differences between the two bills. After any differences are resolved, it will be sent to the White House. We expect President Bush to approve the final bill.

In our view, a corporate bond yield is an appropriate discount rate for funding purposes. After all, this is the rate used generally to calculate annuity benefits and represents a reasonable lower bound benchmark for the expected return on a pension funds' assets. In addition, it corresponds to the discount rate used for calculating the accounting pension liability under FAS 87 (although FAS 87 uses a non-smoothed rate).

2. **Yield curve proposal for matching the discount rate to the duration of the liabilities.** The Bush administration had proposed that different discount rates be used in calculating the present value of liabilities based on the age of pension fund beneficiaries. The yield curve approach was also incorporated into a bill introduced by Senator Grassley, the Chairman of the Senate Finance Committee. The notion is that this would result in a more precise estimate of the present value of the liabilities. Given the current steepness of the yield curve, this proposal would tend to result in a higher present value estimate than using a single corporate bond yield as the discount rate. It also would result in higher liabilities for companies with older workforces and retired populations.

Although calculating the present value of the liabilities on this basis would be complex, it clearly is feasible. In our view, its attractiveness depends, in large part, on the importance of estimating the present value of the liabilities precisely. In our opinion, the conclusion here rests on the relative gain in the precision of the estimate versus the ongoing volatility in the present value of liabilities caused by ongoing changes in interest rates. For example, if the liability estimate were only 10% more precise versus a year-to-year change in estimate caused by interest rates of 20%, we would be skeptical that the change would be worth the effort.

3. **New FASB disclosure requirements.** New disclosure rules issued by the FASB in December 2003 will provide analysts and investors with additional information on many important characteristics of a company's pension plan. This information will allow for a more thorough evaluation of the plan's impact on the overall financial results of the company as well as the assumptions utilized by management. The new disclosures relate to such areas as plan assets, contributions to pension plans, and cash payments to retirees.

In general, we favor these new increased disclosure requirements. We believe that investors will be especially interested in the new disclosures related to plan asset allocations and estimates of contributions to be made

over the next year. We do not believe that these new disclosure requirements will place an excess burden on financial statement preparers. Most of the information required by the new disclosure rules should already be compiled by plan sponsors.

4. **Elimination of smoothing and imposition of mark-to-market accounting for pension fund assets and liabilities.** The FASB recently elected to discuss a potential joint pension accounting project with the IASB at their April 2004 meeting. The IASB is currently reviewing IAS 19, the international accounting standard for employee benefits. It is likely that the IASB will adopt pension regulations similar to FRS 17, the pension rules adopted by the UK Accounting Standards Board, which call for the recognition of plan assets and liabilities at market value on the balance sheet with no related smoothing. Sir David Tweedie, chairman of the IASB, was chairman of the UK ASB when it developed FRS 17, and he supports this model. There also may be immediate recognition of pension asset gains or losses. However, financial performance reporting projects being conducted independently by both the FASB and the IASB have proposed replacing the income statement with a statement of comprehensive income. As the presentation of all income and expenses remains in flux, predicting the ultimate treatment of actual pension plan asset gains and losses is difficult.

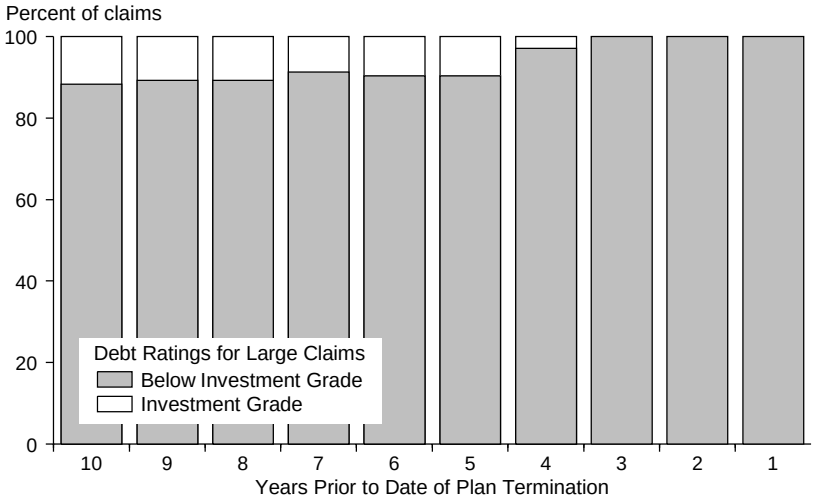
We would not be in favor of a system in which pension fund results on a mark-to-market basis flow through the income statement, as this would just create even greater earnings volatility. Just as the corporation does not flow the reduction in the present value of its corporate bond liabilities through its income statement when interest rates rise, so should companies not be required to flow mark-to-market adjustments in their pension fund assets through corporate earnings. In our view, the accounting standards should be consistent. FRS 17 avoids this problem by the division of pension expense into operating costs and financing costs with differences between actual results and actuarial expectations not hitting the income statement. As discussed, potentially shifting from an income statement to a statement of comprehensive income would alter this treatment. Finally, FRS 17 is controversial among countries that do not yet have a comparable standard.

5. **Pension Benefit Guaranty Board risk-adjusted premiums.** One proposal that has circulated is the idea that the PBGC might base the premium on the proportion of pension fund assets invested in equities. The idea is that since equities are more risky, such plans should compensate the PBGC for this exposure.

This strikes us as misguided. That is because the risk to the PBGC depends not on the proportion of assets that is invested in equities per se, but instead on the risk that the corporate entity will go bankrupt and that the pension fund assets will be less than the value of the liabilities that are guaranteed by the PBGC when that occurs. This would appear to depend mostly on the health of the company and the adequacy of its pension fund assets. Thus, it might make more sense to base the premium on a combination of the company's corporate debt rating, which is highly correlated with the probability of bankruptcy, and the adequacy of the pension funds' assets. The PBGC has also discussed the strong relationship between a company's debt rating and plan terminations (see Exhibit 3). The proportion of the assets that are invested in equities could

conceivably be a factor in evaluating the adequacy of the plan's assets. However, to justify this, the PBGC should be required to demonstrate that its loss experience is influenced by the equity proportion of a pension fund's assets after taking into consideration the adequacy of the fund's assets and the credit rating of the company.

Exhibit 3: PBGC Losses Closely Related to Credit Ratings



Note: Based on 27 of PBGC's largest claims representing over 50% of all claims.
Source: Pension Benefit Guarantee Corporation.

6. **Pension Benefit Obligation (PBO) treated as debt by the credit rating agencies.** The proposal is that the credit rating agencies would explicitly consider the PBO as debt in evaluating a firm's financial condition.

If this change were implemented, we doubt that it would have a significant impact on credit ratings. That is because the credit rating agencies already consider the funding status of defined benefit pension plans in their assessment of a firm's financial condition. However, this change might cause companies to become more mindful of the magnitude of any unfunded obligations. In that regard, it could work to reduce the attractiveness of equity holdings because the volatility of equity prices would affect the size of the unfunded obligation.

7. **Core earnings.** Standard and Poor's has implemented a measure of core earnings that treats pension fund returns asymmetrically. Actual returns on plan assets can only be used to offset interest costs. If actual returns exceed interest costs, no recognition of the excess gain is permitted.

If the core earnings measure were an important component in equity valuation, then the asymmetric treatment would push companies to immunize their pension fund plans in order to avoid losses. However, the S&P core earnings measure has received mixed reviews in the investment and accounting communities, partly due to the asymmetrical treatment of pensions. We also disagree with their treatment of pensions. We do not believe that core earnings are an important factor in equity price determination or that, under their current formulation, they should be. Thus, this should not be a major factor in influencing corporate decisions regarding their defined benefit plans.

The Reaction of Corporate Pension Funds to These Proposals

The Committee on the Investment of Employee Benefit Assets (CIEBA) conducted a survey of its member companies to assess the impact of the seven proposals discussed above on how they would change their behavior in response to these initiatives. The survey results indicate:

1. **Most companies (74%) would change their behavior in response to the collective impact of all seven initiatives.**
2. **The respondents rated the FASB elimination of smoothing as the most important development that might influence their behavior.** This was followed by the Treasury requiring an unsmoothed yield curve in the calculation of liabilities and the PGBC altering the premium based upon the equity allocation. In contrast, the increase in disclosure requirements was considered significant by only 8% of the respondents.
3. **The general impact of the proposals would be to encourage companies to lower their equity allocation, raise their bond allocation, and extend the duration of their bond maturities.**
4. **For most of those contemplating a portfolio shift, they anticipated that the shift would take place over a period of one to three years.**
5. **In general, only a small proportion of the companies viewed the changes as "very likely" to cause them to freeze new entries into their defined benefit plans (21%), freeze accruals (9%), or switch to cash balance plans (11%).**
6. **However, nearly half of all companies viewed such shifts as either "very likely" or "possible."**

As a result of these findings, we conclude that the biggest impact would be the likely shift in the defined benefit plan asset mix away from equities into bonds. We examine this in the next section.

In general, we do not find the survey results surprising. The new initiatives are generally designed to accomplish three goals:

1. **Keep measured liabilities closer to actual liabilities.**
2. **Encourage companies to keep assets in closer alignment with actual liabilities.**
3. **Increase transparency and disclosure about pension fund exposures.**

Regulatory changes implemented to achieve these three goals tend to make equities less attractive as pension fund assets. Equities are riskier assets than bonds. That is why they have higher expected returns. The potential cost of this, however, is greater volatility in price. Current regulations act to dampen the effects of this volatility on pension plans, encouraging pension plans to hold more equities. The new initiatives move away from this. Thus, equities become more "risky" to hold as under the new initiatives equities would induce more volatility into the contribution requirements, balance sheet, and income statement than under the current regime. It is scarcely surprising then that the result of the initiatives would be for companies to reduce their equity exposures.

Such a shift would reduce the risks induced by this volatility. Of course, the consequence would also be lower expected returns on plan assets and

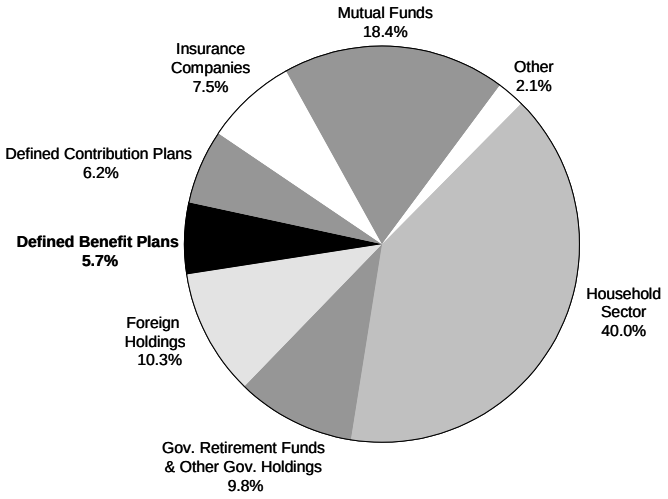
a higher long-run cost for funding their pension fund obligations. There is no free lunch. Higher returns imply higher risks. The pension plans have to make a trade-off between these. The regulatory and accounting regime affects precisely where these plans strike this trade-off.

The Impact on Financial Asset Prices

In general, we find that the impact of the portfolio shifts on financial asset prices would be quite modest for three reasons. First, the defined benefit plans that would be affected by these changes hold a relatively small share of the total US corporate equity and bond markets. For example, corporate defined benefit plan holdings of equities and mutual fund shares (we assume that these were predominantly equities, although the largest equity mutual fund category, growth and income, currently has a substantial fixed income component) were estimated by the Federal Reserve Board at $766.9 billion as of year-end 2002. This was only about 6% of the total value of the US equity market (see Exhibit 4). The share of the US bond market (Treasuries, agencies, corporate, and asset-backed securities) is even smaller. As shown in Exhibit 5, slightly less than half of total defined corporate pension fund assets were held in equities, including mutual fund shares, as of year-end 2002.

Second, most of the survey respondents do not expect to make particularly large shifts in their portfolios away from equities. More than ¼ of all respondents plan no change in their portfolio mix. Only about 22% of those surveyed expect to reduce their equity allocation by more than 20%. To calculate the total shift, we take the midpoint of the survey responses, weighted by the proportion of respondents. In the top category, reduce equity by more than 20% of total assets, we assume that this group would reduce exposure by 50%. This would seem to be the high side of what actually is likely given that the survey respondents only had, in the aggregate, 62% of their assets in US and international equities. Also, a lower value than this seems likely, given that only 22% of all respondents view an all bond portfolio as possible.

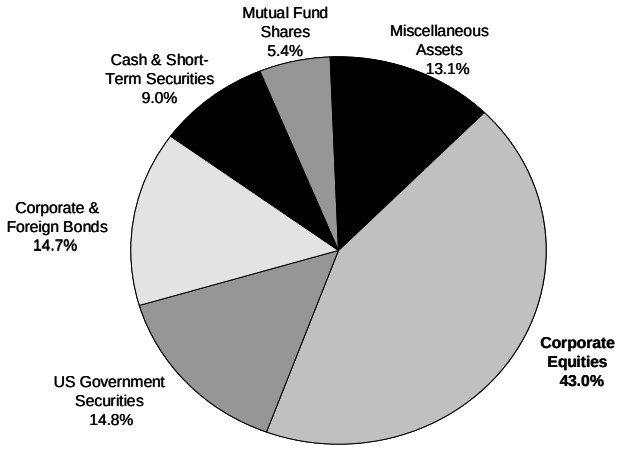
Exhibit 4: Corporate Defined Benefit Plans: A Small Share of the US Equity Market…



Share of Corporate Equities Outstanding by Sector
2002 Q4

Source: Federal Reserve Board.

Exhibit 5: …But a High Share of Plan Assets



Composition of Corporate Defined Benefit Pension Fund Assets
2002 Q4

Source: Federal Reserve Board.

Calculated in this manner, the survey results imply a reduction in equity exposure of about 16%. Applied to total corporate defined benefit pension fund equity holdings of about $1.6 trillion, this implies a reduction in equity holdings of about $250 billion. (We are assuming that the entire universe of corporate pension benefit plans responds in the same way as those companies that participated in the CIEBA survey, as we have no *a priori* reason to believe that non-respondents will react differently). The $250-billion figure compares to a total market capitalization of the US equity market of about $12 trillion as of year-end 2002.[4]

Third, we believe that the price elasticity (i.e., how much the price changes relative to shifts in supply) is relatively low. As a result, the equity sales by the pension funds would not result in a large decline in the equity market. We base this conclusion on an analysis by our Equity Derivatives Research Group of the impact on share prices over the 1992-2000 period when a stock was added to the S&P index for the first time. This research finds that the average share price increased by about 9% when measured to its relative preannouncement price to the time shortly after it was added to the index. With funds indexed to the S&P 500 representing about 9% of the total market capitalization of the S&P 500, this implies a price elasticity of about 1.

Applying this elasticity to the shift in supply—about 2% relative to the market capitalization of the US equity market—this implies a price impact of about 2%. In fact, this estimate of the price effect is likely to reflect an upper bound for three reasons. First, sales by defined pension benefit pension plans will occur much more slowly than when indexers purchase a particular stock after it first is added to the S&P 500 index. Second, there are offsetting impacts. Any fall in equity prices would tend to lead to less equity issuance, all else equal, which would dampen the

[4] For simplicity, we assume that the reduction in equity holdings occurs exclusively in US equities. In fact, it would occur more broadly, leading to a somewhat more modest impact than our calculations imply.

price impact. Also, if pension funds were to increase their demand for bonds and extend the duration of their bond holdings, this would tend to flatten the yield curve, and this could provide some lift to the equity market. Third, this impact is based upon the collective impact of all seven initiatives being enacted. In fact, some probably will not be enacted, or enactment will occur over different time intervals, dampening the impact on the US equity market. Taking these factors into consideration, we would be surprised if the enactment of the seven initiatives discussed above had an impact on the level of equity prices of more than 1%. In other words, the impact would be negligible.

We also believe that the impact on the fixed income market would be very small. If we assume that all the equities that are sold were invested in bonds, the increase in bond demand would represent only about 1½% of total outstanding Treasury, agency, corporate, and foreign bonds. The impact of such a shift on long-term interest rates is also likely to be modest. To see this, consider that a recent Fed staff study concluded that an expected increase in Treasury supply of 1% of GDP that lasted for a decade would increase long-term yields by about 25 basis points.[5] Currently, this represents an increase in prospective supply of about $100 billion per year.

To calculate the likely impact on the bond market of the increased appetite by corporate defined benefit plans, we assume that all the equity sales are invested in bonds over a two-year period. This implies an increase in demand of about $125 billion per year. Taking the ratio of the increase in supply to the $100-billion benchmark of the Fed study implies a reduction in interest rates of about 30 basis points. In fact, the reduction would likely be considerably smaller than this for two reasons. First, the increase in demand would be smaller on a relative basis than the $100-billion benchmark set in the Fed study because it would occur versus a larger universe of securities. The total value of the bond market—Treasuries, agencies, corporate and foreign bonds, and mortgage-backed securities—is many times the size of the Treasury market. Second, the sharp increase in demand would be transitory. In calculating the impact on Treasury yields, the Fed staff study implicitly assumed that the supply shift persisted for a very long period. Thus, we would be surprised if the increase in demand would push down long-dated yields by more than 10 basis points.

These results assume that defined benefit plans sponsored by state and local governments do not alter their own asset allocations as corporate plan sponsors shift their asset mixes. We believe that this is a reasonable assumption because the changes that are being contemplated would not apply to state and local government plan sponsors. The proposed changes do not alter the actual risk associated with pension fund investing in terms of asset risk/return characteristics. Instead, the changes influence how this volatility in asset returns and the liability of pension fund obligations is reflected in accounting and funding rules.

If state and local governments were instead to adjust their portfolios in the same way as corporate defined benefit plans, then the impact on stock and

[5] See "New Evidence on the Interest Rate Effects of Budget Deficits and Debt," Thomas Laubach, *Finance and Economics Discussion Paper* 2003-12 (April), Board of Governors of the Federal Reserve System.

bond markets would be considerably greater given the fact that these plans hold a significant proportion of equity and bond assets.

Our results also do not explicitly consider the risk that equity markets might overshoot on the down side as other equity investors anticipated the forced liquidation of equities by plan sponsors. While this is certainly a possible outcome, it is difficult to evaluate. By its nature, such "overshooting" would be irrational in the sense that efficient markets theory implies that astute investors would profit by intervening and purchasing equities on an overshoot, thereby preventing such overshooting from occurring.

Other Impacts

If defined benefit plan sponsors shift their portfolios away from equities into bonds, one consequence will be lower expected returns and higher expected contributions over time. However, this increased burden is not likely to be particularly large. In the current environment, we believe that the excess return on equities is about 2 percentage points compared to high-grade corporate bonds. Thus, a shift of $250 billion into bonds from equities would reduce expected returns by about $5 billion per year. Our equity risk premium assumption is lower than that implied from *ex post* historical returns on equities versus corporate bonds. However, a lower risk premium than that suggested by historical returns appears appropriate given that a significant proportion of the higher *ex post* returns were generated by a secular rise in stock market valuation. This provides a one-time boost to returns. Once a higher valuation level is reached, the expected excess returns from equities should be lower rather than higher going forward. This is why we believe a 2% excess return assumption for equities versus corporate bonds is appropriate.

In the current environment, some of this increased cost could be offset by the planned increase in the duration of pension fund bond portfolios. According to the CIEBA survey results, about ½ of the respondents would increase the duration of their bond portfolios. Given the fact that the yield curve is normally upward sloping, longer durations would tend to raise the long-run rate of return on fixed income assets.

An increase in annual funding cost of $5 billion, however, would be large enough to have consequences on employment, wages, profits, and the willingness of plan sponsors to continue to keep their plans open to new employees. At first, corporate sponsors would bear the costs in the form of lower profits. However, over the longer run, corporations could be expected to shift this burden onto workers in order to remain competitive. In the long run, the burden would probably be mainly borne by the workers in the form of lower employment, wages, and/or the loss of pension benefits.

At the margin, the proposed changes would exacerbate the decline in the defined benefit pension system. This is unfortunate because the continued shift to defined contribution plans significantly increases the burden on households in their retirement planning. Under a defined benefit plan framework, corporations, backstopped by the PBGC—funded by premium income from plan sponsors—typically guarantee a fixed monthly retirement benefit. This shifts the investment risk from the individual to the plan sponsor. It also reduces the risk of an individual outliving his or her financial assets under the defined contribution plan framework.

Exhibit 6: Equity Risk Diminishes as Holding Period Increases

Holding Period	Standard Deviation*	Expected Excess Return on Equity	Risk of Real Annualized Returns Below 3.5%	Risk of Real Returns Below 0%
10 Years	5.9	1%	43%	22%
		2	37	18
		3	31	14
20 Years	3.3	1	38	8
		2	27	5
		3	18	2
30 Years	1.5	1	26	0
		2	10	0
		3	3	0
40 Years	1.4	1	24	0
		2	8	0
		3	2	0

* Standard deviation of annualized real equity market returns over the holding period.
Source: Robert Shiller. Our estimates.

Also, it should be noted that the defined benefit plan sponsors are well-suited to undertake equity investments. That is because the duration of their liabilities is usually quite long. This is important because while equities are riskier than bonds, the likelihood that equities will under-perform bonds declines markedly as the investment horizon lengthens (see Exhibit 6).

Exhibit 6 illustrates the standard deviation of equity returns and the risk that equities will outperform bonds over different time horizons (we assume that bonds generate an annualized real rate of return of 3.5%). The calculations are based on Robert Shiller's 1871-1999 US equity market dataset. As can be seen in the exhibit, the standard deviation of equity returns falls sharply as the holding period rises from 10 to 30 years.

The likelihood that equities will underperform bonds is also dependent on the expected excess return from holding equities versus bonds. For example, if the excess return is 3%, then there is only a very small risk that the real rate of return from holding equities will be below 3.5% per year on a 30-year time horizon. If one assumes a lower expected excess return, then the risk of underperformance increases. But even at 1%, the risk of underperformance is relatively low (26%) on a 30-year time horizon.

The exhibit illustrates the point that if one can take a long-run view—which is appropriate when the pension fund liabilities are of long duration—then there is an excellent case for equities as a core asset holding. As most corporations expect to be going concerns for many decades, such a long investment horizon is appropriate for the defined benefit plans that these corporations sponsor.

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Pension Missiles: Is the Cure Worse than the Disease?

A Report to CIEBA

- **Tough Medicine for Pension Plans**
  Proposed changes to defined benefit (DB) pension plans might kill the patient if applied as shock treatment. Appropriately phased implementation of any agreed changes is essential to strengthen the DB system, but doing nothing could condemn the patient to a slow death.
- **End of the Perfect Storm?**
  The markets' recovery has reduced plans' huge funding gap. But unfavorable demographics and the legacy of inadequate funding mean that plans' underlying health is worse than it appears under today's flawed accounting, funding, and tax rules.
- **Trouble still ahead**
  Absent significant contributions or returns that we think are unattainable, the underlying economic gap between plan assets and plan obligations will widen. Critically, the least healthy plans are infecting the system, shifting liabilities to stronger DB plans and ultimately, to retirees or taxpayers.
- **The reform proposals as "missiles."**
  DB plan CIOs see these proposals as an attack and will likely respond by increasing bond allocations and bond portfolio duration. This response would reduce plan risks. But it would also add to the short-term stress on corporate cash flows and doubtless increase the reported costs of a DB plan. Thus, even the gradual adoption of some of these proposals could prompt plan sponsors to reconsider DB plans entirely.
- **Macro Impact**
  The economic impact of this reallocation of funds likely would be small, because it probably would temporarily reduce equity prices and flatten the yield curve. The macro impact of freezing DB plans and/or the impact of pension contributions on corporate cash flow (and thus capital spending and hiring) would also probably be small.
- **Balanced reform needed soon**
  The corporate DB system can be healthy and efficient if plans make affordable choices and if both sponsors and regulators manage them appropriately. Neither group should overreact to the recent past, greater transparency and a balanced approach to reform are both critical.

Executive Summary

Tough medicine for pension plans. Proposed changes to the measurement, funding requirements, and reporting transparency of defined benefit (DB) pension plans might kill the patient if applied as shock treatment. While appropriately phased implementation of any agreed changes is essential to strengthen the DB system and its plan sponsors, doing nothing could condemn the patient to a slow death. We believe that appropriate reforms would reinforce the legitimate role of DB plans in contributing to retirement savings.

Why now? The perceived crisis from shortfalls in DB plans and the associated but opaque risk to investors and the taxpayers were the catalysts for the proposals. To be sure, the simultaneous sharp decline in equity markets and interest rates that triggered the crisis was probably a once-in-a-generation event, and, over the long haul, rates and returns should recover. Plan asset managers have done their job in the past, if anything delivering average returns that exceed the long-run return assumptions of typical DB plans. Moreover, circumstances beyond plan sponsors' control contributed to the crisis: Regulations discouraged appropriate funding, and, in the early days of DB plans, few could have anticipated plan sponsors' declining business fortunes, the shift to early retirement, or the increase in longevity that boosted post-retirement obligations, especially relative to current business activity.

Nevertheless, the proposals are aimed at correcting real flaws in the DB system. The bull market of the '80s and '90s gave corporate managers an artificial boost to reported earnings and led them to increase benefit promises without annually funding them. Managers became complacent about the long-term challenges of funding these promises when returns inevitably reverted to the mean, and they overlooked the need to match assets and obligations. The shortfall from the bursting of the equity bubble and the simultaneous decline in interest rates unmasked the basic mismatch, and many plan sponsors will be forced to make additional cash contributions for many years to come. We believe the time has come to calculate precisely the economic and financial risks to plan sponsors in DB plans, and to fund them more appropriately in order to minimize the risks for all stakeholders.

Trouble still ahead. Some think we are crying wolf when the worst appears to be over for DB plans in aggregate. Rising equity prices and bond yields as well as increased company contributions have reduced the asset-liability shortfall, and many plans will continue to contribute to sponsors' reported operating earnings this year. But without significant contributions from plan sponsors, the underlying economic gap between plan assets and plan obligations will widen as the pool of retirees exceeds the active workforce. Critically, some plan shortfalls and duration mismatches are far worse than others. Maintaining the status quo allows the least healthy plans to continue infecting the system, shifting liabilities to stronger DB plans and ultimately, to the taxpayer.

The reform proposals as "missiles." The reform proposals are aimed at exposing the underlying economics of DB plans and giving sponsors incentives to reduce the risks that all stakeholders face. The missiles fall into three categories: increased transparency (via changes in financial reporting rules); funding and guarantee rules for government entities (through changes in regulated rates for calculating obligations and pricing asset allocation risks); and a reevaluation of rating agency approaches.

Impact on Corporate America. Plan sponsors are being forced to inject larger amounts of cash into their plans to address shortfalls. If adopted, the proposed changes could magnify and accelerate that trend in the short term. For a few companies, the short-term contributions and earnings impact of changes will swamp their operating performance, for most, the outcome will be easily manageable, if addressed now.

Risk reduction response: No free lunch. DB plan CIOs see these proposals as an attack and will likely respond by adopting a more risk-averse, matched asset mix — increasing bond allocations and bond portfolio duration. This response would add to the short-term stress on corporate cash flows and increase the need for shifts to avoid further mismatches. Critically, reducing risk in the portfolio is a two-edged sword: It will better align plan assets and income with future cash benefit payments and strengthen the DB system, but it will doubtless

increase the reported costs of a DB plan. Thus, even the gradual adoption of some of these proposals could prompt plan sponsors to reconsider DB plans entirely.

Impact on asset prices. This reallocation of funds from stocks to bonds theoretically could produce offsetting moves in asset prices. If state and local government retirement funds follow suit, the rebalancing could temporarily reduce equity prices by as much as 8–12% and flatten the yield curve by as much as 40–150 basis points from prevailing levels. The impact would also depend on the speed of reallocation and on changes in the supply of bonds and equity.

Macro impact: Beyond asset prices. These crosscurrents in asset prices are unlikely to have a major impact on the economy because lower bond yields would offset the impact of lower stock prices on economic activity. Freezing DB plans and/or the impact of pension contributions on corporate cash flow (and thus capital spending and hiring) could be more important, but from a macro standpoint the expected impact of such events would also probably be small. The numbers appear daunting: In response to the implementation of the proposals, 30% of surveyed CIEBA members think they would likely freeze accruals or new entry. And while only one-fifth of the private workforce is covered by DB plans, limiting the economy-wide effects, ripple effects could magnify the impact. In any case, freezing a DB plan does not eliminate a shortfall, especially for the plans most at risk, which must fund existing accrued benefits.

Conclusion and recommendations. The corporate DB system can be healthy and efficient if the promises made are affordable and appropriately managed. Market conditions over the past three years have exposed weaknesses in the current DB system that should be carefully addressed, but neither regulators nor plan sponsors should overreact to the recent past, in our view; the worst of the funding shortfall appears behind us, at least for now. Thus, greater transparency and a balanced approach to reform are both critical. At the same time, neither regulators nor plan sponsors should let today's improved market conditions renew complacency about DB plans' health. Unfavorable demographics mean that, for any level of risk appetite, DB plans will cost more than originally thought. DB plans' underlying obligations and funding will require plan sponsors to adjust their actions. The future of the DB system depends on carefully implementing appropriate reforms that ensure that plan sponsors act promptly to adequately fund liabilities while taking on prudent economic risks.

Pension Missiles: Is the Cure Worse than the Disease?

Incoming Missiles

Proposed changes to measurement, funding requirements, and the reporting transparency of corporate defined benefit (DB) pension plans are aimed at improving them, but there is a risk that these cures would kill the patient if applied as shock therapy. If implemented abruptly, five of the seven proposals or "missiles" we evaluate here might result in significant changes to asset allocation and/or lead to plan freezing, outcomes that in our view could unfortunately sound the death knell for the defined benefit concept. Under current circumstances, we believe that too-rapid implementation would impair or threaten the financial health of a substantial number of plan sponsors, which might respond with bankruptcy and/or plan termination. And while we believe that US financial markets and the economy can easily absorb the short-term macro impact of such an abrupt adoption, the aftershocks could trigger some macroeconomic dislocations. For example, the bankruptcy of some leading companies could disrupt suppliers and customers.

If implemented gradually, however, we believe that appropriate measures would strengthen the DB system and ensure a legitimate role for DB plans in providing retirement savings. Such measures would modify some of the proposals and go beyond them. It is not our purpose here to recommend specific remedies to fix the DB pension system. But we do generically endorse four major areas for improvement:

1. Realistic and appropriate funding rules and incentives for sponsors to implement them;

2. Realistic and appropriate pension accounting principles that provide transparency about the financial health and riskiness of each plan to investors, regulators, and sponsors;

3. Require that plans report scenarios that stress-test future plan costs (cash flows) under a variety of assumptions, akin to "value-at-risk" calculations for financial institutions; and

4. Improve the portability of DB plans so that active participants can change jobs without losing "earned" but "unsecured" benefits from generous final pay plans. This may also limit the lump sum withdrawals on early retirement that disrupt matching and efficient management of plan assets and obligations.

Some believe that a third alternative — maintaining the status quo with minor changes — is now viable. After all, the financial storm created by falling rates and stock prices during 2000–2002 was a "70-year flood" for DB plans, and the worst of the resulting funding shortfall is likely behind us — for now. A combination of this year's recovery in equity markets and over $80 billion in plan contributions in 2002–03 has reduced the expected 2003 funding gap below the 2002 and mid-2003 shortfalls.

Unfortunately, however, DB plans' problems run far deeper than the snapshot of their financial health conveyed by today's or even tomorrow's funding gap. Indeed, their problems are rooted not in financial but economic mismatches created by years of underfunding relative to the promises made, and overly optimistic mortality and retirement assumptions. These problems are manifest most clearly in the increasing ratio of inactive to active plan members. That mismatch will magnify the drain on plan sponsors' operating performance of any negative market outcomes.

Looking forward, some plans face massive short-term funding needs as the growth and duration of retirements increase over the next decade. Even if yields and equity prices rose by enough to eliminate plans' current short-run funding gap — and such a rise seems to us to be highly unlikely — they would have to keep rising at an unrealistic pace to solve their long-term problems. Our calculations illustrate the two discouraging sides of the same coin: If returns average 8%, sizable annual funding needs will likely persist. Alternatively it would take implausible returns to eliminate the need for increased funding.

Thus, retaining the status quo in our view is a non-starter: It would condemn the DB system to a slow death, for four reasons. First, we estimate that, under reasonable economic and financial assumptions, the funding gap for DB plans in aggregate is still in the vicinity of $170 billion — not large in relation to the economy, but large relative to plan sponsors' current resources. Second, the aggregate ABO/PBO present value calculation under similar assumptions masks the immediate and daunting time profile of plan liability cash flows over the next ten years. In other words, time may not be on plan sponsors' side because the growth in

benefit payments is likely to rise steeply over the next decade, and asset returns needed to cover interest and service costs are high. Any shortfall in these returns has a quickly compounding effect that would require new funding. Third, the economic fortunes of DB plan sponsors seem unlikely to improve soon enough to provide the needed funding. Finally, and as a result, while the worst of the crisis may seem to be over, several sponsors still lack the resources to fund their plans as promised and may ultimately file for bankruptcy and/or terminate their plans — with or without changes to regulations. So doing nothing is simply not a sustainable alternative.

Why Are the Missiles Coming Now?

The perceived crisis in DB plans and associated risk to the taxpayer and shareholders were the catalysts for the reform proposals. The missiles are not aimed at plan asset managers; after all, they have done their job in the past decade, if anything delivering average returns in excess of assumed long-run expected returns. Rather, they are aimed at correcting the inappropriate funding and accounting regulations and assumptions of the past that laid the foundations for the crisis. We believe, and we think the authors of the proposals believe, that the time has finally come to better understand and calculate the magnitude of the promises made, reflecting economic and financial risks to the plan sponsors in DB plans. Transparency and better measurement of the underlying obligations can lead to more appropriate funding and risk analysis so that DB plans rarely become a burden to stakeholders.

The proposals are aimed at forcing plan sponsors to take the steps needed to assure the DB plans' fundamental long-term health as one of the three basic legs of the retirement saving stool. The proposals go beyond simply assuring actuarial solvency by matching the present value of liabilities to today's assets. Instead, they would require matching much more closely the cash inflows and reserves with the likely path of cash outflows that plans face today.

Of course, the framers of the DB plan funding reform proposals focused only on reducing shortfall risk in DB plans, not on whether plan sponsors could continue to afford the plans under new rules of the game. The hard truth, in our view, is that with or without appropriate changes to such rules, DB plans in general will require more funding. The pension funding holiday taken by many corporations in the 1990s, combined with increased promises and unrealistic assumptions, placed an intolerably high burden on the returns that plan asset managers need to generate. With this funding holiday in our view effectively over, the critical need now is that the required "catch-up" and rethink of asset allocations must be gradual to avoid a rush to the exits. With appropriate rule changes, policy makers can still achieve the right balance between plan risk and affordability so that most plans can deliver on their promises.

It was not always thus for DB plan sponsors; time was once on their side. Employees were not as footloose as they are today; in the early development of industrial organizations, employers, and employees often expected a lifetime partnership. The result was that payments to employees for services rendered were assumed to continue from the time of employment through retirement until death, for both the employee and his/her dependents.

In addition, two other key principles made DB plans attractive. First, plan sponsors could achieve superior returns to individuals through professional management and scale economies in investment management and administration. Second, DB plans mutualized the risk of protracted bear markets across overlapping generations, so today's retirees could still count on their retirement. It's worth stressing that these two principles remain cornerstones of the logic for sponsoring DB plans.

Moreover, it was reasonable to assume that an investment-grade corporation at a minimum had the following strengths that could provide the resources for DB plans at a cost they could afford: A ten-year or longer time horizon, reasonably steady operating cash flow, access to financing, and expectations for productivity enhancement and growth. When combined with the economies of scale in management and administration and the discipline in investing that most individuals lack, it made perfect economic sense for corporations to help employees save and invest for their retirement period while providing an insurance premium.

The DB concept is straightforward: Estimate the employee's retirement age, annuity amount (or lump sum), and life expectancy. Then withhold from each period's wage or salary the amount that will be sufficient to fund those payments, and invest the deferred cash salary in a manner that will provide the appropriate cash payments.

While the framework is straightforward, there clearly have always been uncertainties that determine the sources of risk: specifically, the actuarial estimation of life expectancy, retirement age, and appropriate investment returns. The question is, who does or should bear these risks, and how or to

what extent can they be minimized? In a DB plan, if the sponsor is financially healthy, its shareholders and bondholders bear the risk. If the sponsor is ailing, the employees and, where available, a government guarantor — the Pension Benefit Guaranty Corporation (PBGC) — or indirectly healthy plan sponsors and the taxpayer will share the burden of the risk.

Importantly, plan risks and required benefit payments rise with plan maturity. Thus, funding and asset allocation in our view should reflect the different time profile of cash flows when a plan is mature — even for a going concern. In the early stages of a DB plan, the workforce is young, so the bulk of payments to retirees will not occur for 30 to 50 years, and there is time to fund them. In contrast, for a mature plan with active and retired participants, payments to retirees and contributions for new deferred compensation should occur each period.

Critically, in our view, to mutualize risks across generations, the flow of retirees must be offset with new employees participating in the plan. If the risks are managed appropriately, then there is a steady state where the cash inflows (from returns on the plan assets) and cash outflows to retirees are matched and the DB engine runs smoothly.

This mutualization requirement does not mean that we view DB plans as perfectly analogous to our nation's Social Security system. Far from it. Social Security is the "safety net" in our nation's retirement saving system. Despite current surpluses in the so-called Social Security trust funds, we fund Social Security from taxes on the assumption that economic growth will enable society to meet promises made. In contrast, the DB system has worked under the assumption that plan sponsors could meet promises made by investing deferred compensation, taking prudent investment risks and generating returns commensurate with those risks.

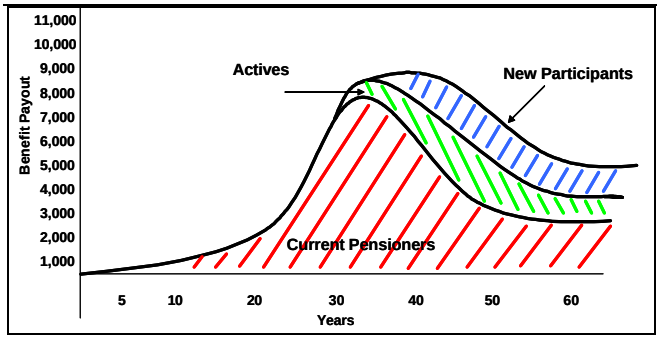
But here are two crucial similarities: First, like Social Security's actuaries, plan sponsors traditionally assume that the plan will go on forever and that the company will grow and add new employees. Those future employees' retirement needs are what enables sponsors appropriately to direct plan investment managers to invest in a portfolio of appropriately risky securities, mutualizing risk across generations. Absent the increasing number of future employees, plan sponsors in our view should direct CIOs to hold a smaller proportion of a DB pension plan's assets in equities than today's 60% norm. We recognize that most CIOs will reject such a notion. Even with no growth, their liabilities stretch far into the future, so taking on investment risk seems appropriate. True enough, as long as the returns are there to meet current cash flow needs, without having to dip deeply into the pool of assets when market returns fall below assumptions.

And that's where the second similarity drives the point home. Actuaries for both Social Security and DB plans have persistently underestimated longevity, so that those current cash flow needs are rising faster than anticipated. So even in a growing economy — or at a growing company — the fact that the retiree population is growing faster than current workers dictates a change in funding and in risk-taking from that steady-state growth assumption outlined above. It's worth noting that current funding regulations make the problem worse by directing plan sponsors to use a 1983 mortality table, so underestimating the size of the cash obligations.

Exhibits 1 and 2 show the typical pattern of cash obligations a company faces in its DB plan, depending on the maturity of the plan (i.e., the proportion of retirees relative to active employees). Exhibit 1 shows a relatively young plan while

Exhibit 1

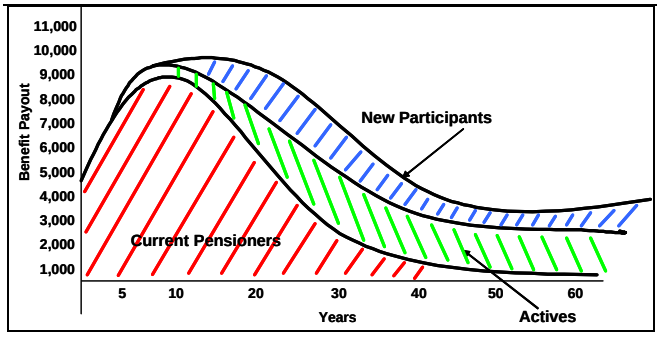
Pension Fund for a Young Company



Source: Morgan Stanley Research

Exhibit 2

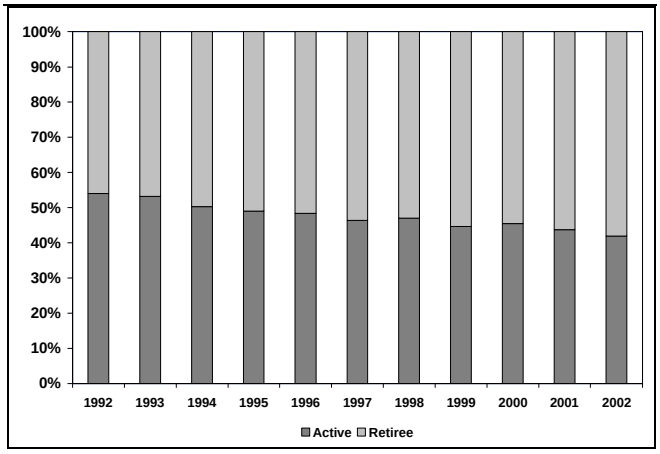
Pension Fund for a Mature Company



Source: Morgan Stanley Research

Exhibit 3

CIEBA Sample: Distribution of Active to Retiree Defined Benefit Plan Participants, 1992–2002



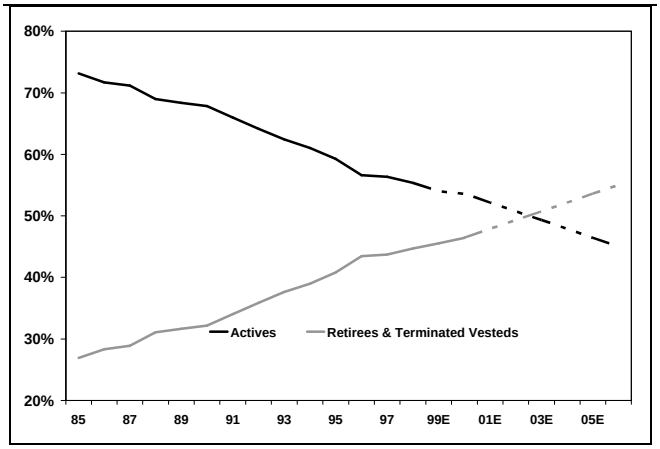
Sources: CIEBA Pension Survey, Morgan Stanley Research

Exhibit 2 shows a more mature plan where retirees (including dependents) are a high proportion of total participants. Exhibit 3 indicates that the mature plan is more typical of the companies in CIEBA.

We should emphasize that today's problems in DB plans arose partly because of circumstances beyond plan sponsors' control: People lived longer than expected; greater competition and changes in technology have forced companies to reduce their workforces over time, changing the demographic profiles; and government regulations of funding rules, including the tax deductibility of funding, and restrictions on the role of pension trustees and advisors, have limited their choices.

Exhibit 4

Retirees Now Outnumber Active Participants, and the Trend Is Unfavorable



Source: US Department of Labor, including estimates

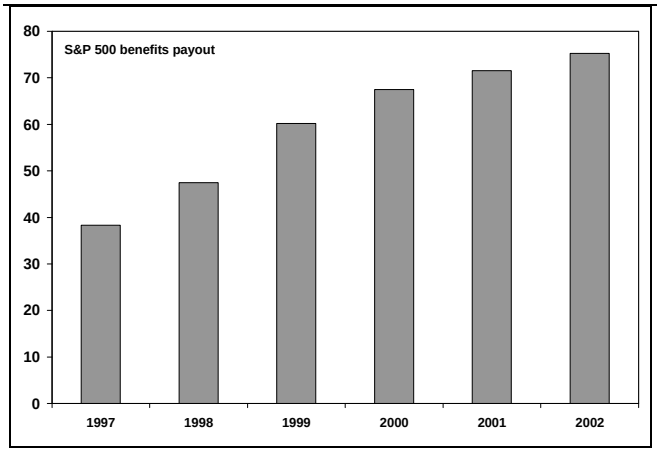
But in hindsight it is also widely agreed that the lack of transparency in financial reporting systems meant that many stakeholders did not understand either the costs or the risks in DB plans, while investors and rating agencies chose to overlook the underlying economic costs and risks, even when information was available.[1] For their part, companies have chosen investment policies that substantially mismatch the timing of cash inflows and outflows, thus hoping to boost returns but also adding risk to their plans.

Thus, without changes, we believe that the US defined benefit pension system as a whole is unlikely to be able to keep promises made. Fundamentally, the problem has two dimensions. The first is a mismatch between the underlying demographics of the workforce and the fortunes of the industries/companies offering these plans. The second is the fact that existing asset allocations that are the legacy of past decisions cannot meet future needs for cash outlays. The fact that the average US company with a DB plan has a demographic bias toward retirees, as shown in Exhibit 3 for the CIEBA universe, suggests that cash outlays are going to grow continuously over the next decade or two (depending on mortality). To be sure, the average is affected by a few companies in the tails of the distribution, so that the median company is healthier than these means imply. Yet we believe that continuous restructuring and outsourcing by plan sponsors exacerbate this trend, and that those tails are getting fatter.

Exhibit 4 shows the same result for the broader universe of all DB plans, based on projections made in 1998 out to 2006. That retirees and terminated vested participants were then projected to outnumber active participants represents a demographic watershed for America's DB plans. The result

Exhibit 5

S&P 500: Pension Benefit Payments, 1997–2002



Sources: Company reports, Morgan Stanley Research

is not just that cash distributions have grown rapidly (Exhibit 5), but that they will continue to grow in the medium term.[2] And in our view, those trends will swamp the impact on plans' long-term funding gaps of almost any plausible rise in interest rates or in equity prices. That view rests partly on our belief that mean reversion is the most powerful force in finance, that the investment climate of 1982–2000 will not be replicated any time soon, and that prudent plan sponsors should not use their CIOs' track records over that period as a basis for future planning.[3]

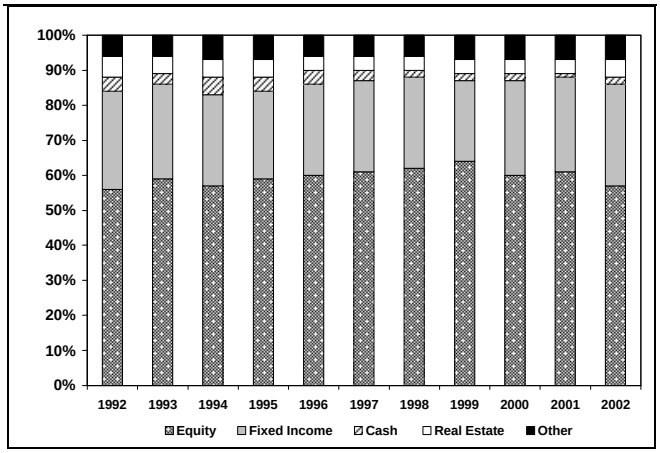
Despite the trend of growing payouts to participants with lower levels of replacement by active employees, the investment patterns have changed little. Exhibit 6 shows the CIEBA data on asset allocations of respondents to its survey from 1992 to 2002. Assets in equities have ranged around 60% depending largely on market cycles, with 1994 and 2000 levels around 57% and peaking in 1999 at 64%, with fixed income capturing most of the change. The survey data also reveal fixed income duration of about 5–6 years, suggesting that on average DB plans are taking both duration and market risk. The market risk in the plan is exaggerated by the economic risk in the sponsor: Many US companies with DB plans are in cyclical industries, so that a fall in equity prices often occurs at the same time that the operating businesses face difficulties.

The result of this mix is shown in Exhibit 7, which also provides a graphic illustration of why so many players are still concerned about the DB pension system. Looking at the companies in the Standard & Poor's 500 Index (S&P 500) with DB pension plans, we see that in 1993–95, prior to the bubble years, companies in aggregate were adequately funded relative to the projected benefit obligation (PBO).[4] As the bull market took off, interest rates were falling and economic growth was rapid, so from 1996–99, aggregate surpluses rocketed to a peak of more than $250 billion.[5] From then on, we see a deteriorating picture, with both asset values and interest rates falling, leading to the large plan deficits reported in 2002. The picture for 2003 is not yet fully known, as companies are only required to report their position annually, and the final numbers depend on the state of the markets and the contributions made by companies by year-end. The projections we include in Exhibit 6 are estimates based on known contributions to date and discount rates and asset market returns through December 2003 (assuming a standard asset mix of 60% equity/35% fixed income/5% cash). What jumps off the page is the fact that by our estimates, funded status has improved only slightly after plan sponsors contributed $47 billion to their plans in 2002 (a 300% increase over 2001 funding levels) and around $35 billion in 2003, a year when the S&P 500 rose by 26%. Even in 2004 we estimate that with an 8% actual return on plan assets and stable discount rates at 6.25%, the aggregate deficit would increase without new funding.

In hindsight, the stock-market bubble actually hurt plans' long-term health. Worse, the bubble made plans look overfunded but gave little indication of the duration and funding risk the companies were taking. We believe that this environment fostered complacency among plan sponsors, their CIOs, and most of the regulators. In a period where many companies could have reduced their funding risk and better matched the cash inflows and outflows, a majority of companies did little. There are many reasons why no action was taken. But we believe the prime candi-

Exhibit 6

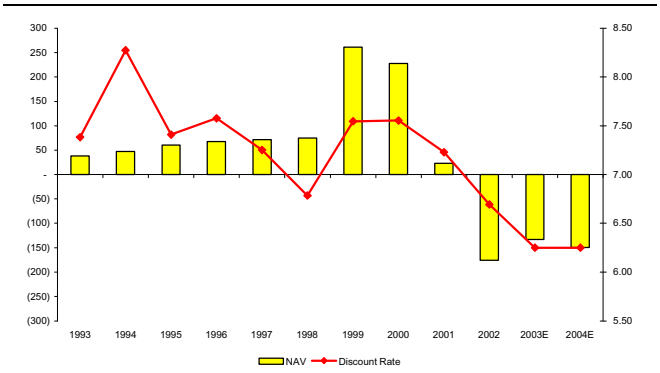
CIEBA Sample: Asset Allocation for Defined Benefit Plan Assets, 1992–2002



Sources: CIEBA Pension Survey, Morgan Stanley Research

Exhibit 7

S&P 500 Pension Net Asset Value and Discount Rates, 1993–2004E



Sources: Company reports, Morgan Stanley Research

Note: 2004E assumes an 8% actual return on plan assets and no funding

dates are as follows:

- First, under US GAAP requirements, high expected returns associated with high asset values were reported as part of operating income. In an investment world myopically focusing on operating income (EBIT) as a measure of performance and EBITDA as a measure of operating cash flows, this was "manna from heaven" for companies hungry for growth and capital. Moving from high-return equity to lower-return fixed income would have been a big negative to EBIT-based numbers.

- Second, actuaries and ERISA-based calculations encourage the use of discount rates that incorporate some risk premium and smoothing of shortfalls so that there is no "penalty" for investing in riskier assets.

- Third, tax rules penalized companies with surpluses from funding annual deferred compensation and some potential shortfalls.

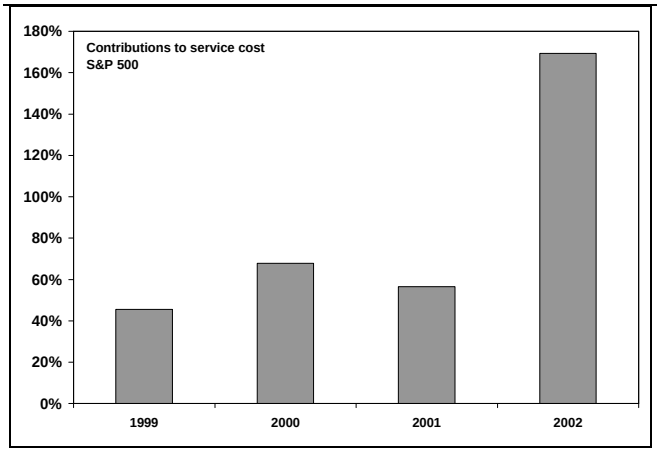
- Fourth, analysts, investors, and rating agencies largely overlooked the pension accounting and funding issues.[6]

Finally, the apparent cash benefits were exaggerated because instead of steadily contributing the deferred compensation of their active employees to pension plans, plan sponsors took extended contribution holidays. As indicated, this action was encouraged by the tax system. In Exhibit 8, we show the ratio of corporate contributions to "service costs" (the accounting measure of deferred compensation) for S&P 500 companies from 1999–2002. Under normal circumstances, that ratio should be 100%. The pension holiday (underfunding) for the period pre-1999–2001 lulled many corporate managers into a false perception that the high returns earned by plan asset managers were not risky and constituted sustainable free cash. Ironically, had the corporate managers chosen to limit the risks by reducing the exposure to risky assets, some of the "missiles" might not have been launched. Instead, they have enjoyed the benefits of the pension holiday and the boost to reported operating income, so the jump to a 160% contribution-to-service-cost ratio in 2002 and the declining benefit to income is a painful shock to many, and demonstrates that the pension holiday is clearly over. We also show the ratio of contributions to benefit plan payouts for the S&P 500 companies in 1997–2002 and for the CIEBA survey respondents in 1992–2002 (Exhibit 9). While these payments are not directly related, companies need to fund their cash payments to retirees from cash returns on their plan assets, annual contributions, or sales of existing assets (including the realization of actual returns). Exhibit 9 clearly shows not only that contributions have grown but that even more must be done to make up for existing shortfalls unless the markets continue to surge.

Ironically, the risk in the current equity rally and backup in rates is that these market developments will alleviate the underlying problem in the short term, making relevant parties feel their problems are solved. In turn, this could create complacency and induce companies to defer actions needed to combat underlying problems, especially if necessary and inevitable increased funding occurs (we detail these actions below).

Exhibit 8

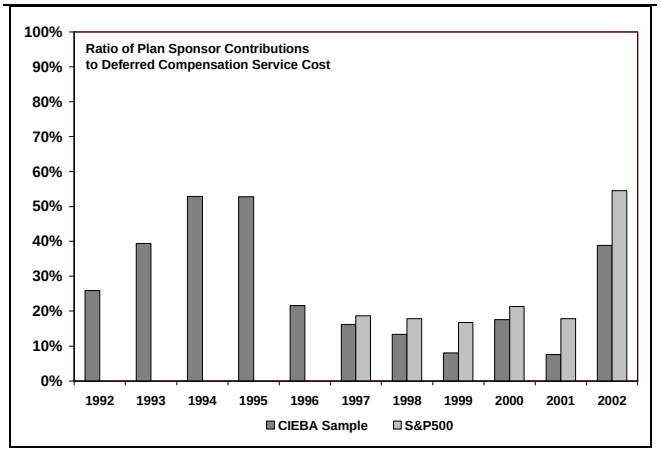
S&P 500 Ratio of Pension Contribution to Service Cost, 1999–2002



Sources: Company reports, Morgan Stanley Research

Exhibit 9

Ratio of Pension Contribution to Benefits Paid for S&P 500 and CIEBA Sample



Sources: CIEBA Pension Survey, Company reports, Morgan Stanley Research

But not taking action now would be a mistake. In our view, given current equity market valuations, further significant improvements in equity markets (i.e., sustained double-digit returns) would require implausible earnings growth. And as we show in Exhibit 7, even with the healthy equity markets of 2003, the aggregate short-term funding gap has been narrowed but not eliminated, and long-term requirements are still growing, so we view the reported obligations to be understated unless benefits promised are reduced. Deferring action in our view risks another pension funding crisis in the near future, which would create an added competitive disadvantage for US corporations.

Responses to the Funding Crisis: Cures or Missiles?

Responses to the shortfall in funding seem to be coming from all sides as various regulatory, accounting, and rating agencies propose changes designed to improve the transparency and funding of plans. The major shift from abundant surplus to significant deficit within a three-year period, shown in Exhibit 7, was the major spur to this relatively swift and prolific set of responses; the recent spate of corporate malfeasance that undermined DC plans at a few companies probably was another catalyst.

In what follows, we consider each of these "missiles" and how they may affect plan sponsors and the overall picture of the corporation's economic health that we argue is needed for an accurate diagnosis. The missiles fall into three categories: changes in transparency of financial reporting; changes in rates used by government entities to regulate funding and risk tolerance of asset allocations; and rating agencies' responses.

Proposed Changes in Financial Reporting

Current US accounting rules under Statement of Financial Accounting Standards 87 (SFAS 87) dictate that plan sponsor companies recognize four main components in the pension cost included in operating costs (see the Appendix for a description of current and forthcoming accounting treatments):

1. *Service cost:* The deferred compensation earned by active employees;

2. *Interest on the pension obligation* (using PBO and an aggregate discount rate);

3. *Expected return on plan assets* (an expected rate of return applied to a market value measure of plan assets); and

4. *Amortization of the difference between actual and expected returns on plan assets* or actuarial gains and losses, based on a complex set of rules.

Plan assets and obligation are shown as a net amount on the balance sheet, subject to complex rules allowing deferral of unrecognized gains and losses. These rules can lead to illogical outcomes, as in the 2002 fiscal year, when many companies swung from reporting pension assets to pension liabilities with offsets to equity and even the creation of an intangible asset. Since our first *Apples-to-Apples* report published in February 1998, we have expressed our concerns with the US GAAP treatment of pension costs and obligations. Specifically, we advocated the separation of service costs, which are operating in nature (deferred compensation) from the financing costs. We also expressed concern over (1) the lack of transparency in the asset allocations and (2) the timing and potential uncertainty in the benefit payments due to participants.

As increasing numbers of analysts and investors became concerned with the accounting for pensions, a broad push for changes began. The FASB has begun its review of the pension accounting question with a rethink of its disclosure rules for the second time in the last five years. The primary focus of this change, which was passed and took effect in December 2003 for companies with fiscal years ending in December, is to provide more information about the asset allocations and distributions of the obligations, so that the funding and performance risk in pensions can be assessed more effectively (see the Appendix for a summary). We applaud these changes and believe they will help investors to more clearly differentiate the relative riskiness of the pension obligations and investment policies of plan sponsors. However, it is clear to the FASB and other observers that many of the current and new disclosures are burdensome and are only necessary to help investors understand and often unravel the inappropriate measurement rules under the current accounting rule FASB 87. So the FASB is expected to take up the larger question surrounding measurement of the pension cost and net obligation (or surplus) in 2004–05.

As part of this rethink (or as part of another project on how to change the income statement as a measure of performance), FASB is likely to take a second step of leaving only the service cost (and prior service cost adjustments) in operating earnings and putting the other items below the EBIT line, as we have advocated for many years. The new disclosures and removal of financing costs from operating income

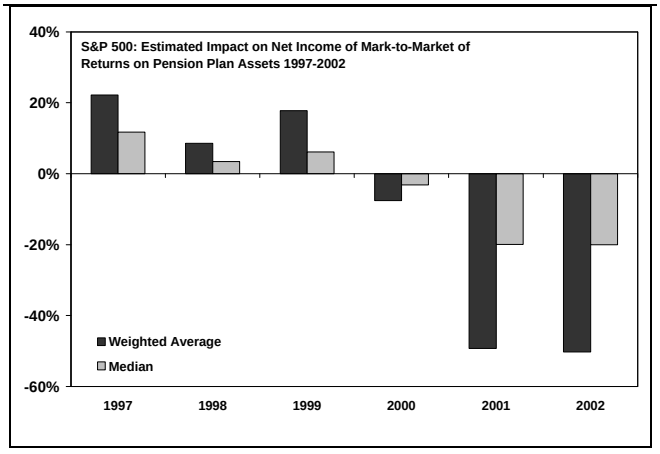
make up an accounting missile that, to our surprise, 92% of CIEBA survey respondents said would have little impact on their actions. We believe that the new disclosures of asset allocations alone will have some impact, as they will make high expected return assumptions difficult to justify in some cases. Furthermore, we expect that the removal of the financing income from operating income will eliminate one incentive to keep equity levels in pension portfolios higher than prudent asset-liability management and risk-taking would otherwise suggest.

In contrast, CIEBA survey respondents believe that the most potent accounting missile comes from a potential move to eliminate the smoothing of returns on plan assets and liabilities, as would occur if the accounting rules moved to a mark-to-market system. This is likely to occur either in response to the current situation or as part of the FASB's convergence with International Accounting Standards.[7] The IASB is widely expected to revise its existing standard to follow the UK's Financial Reporting Standard No. 17 (FRS 17), which requires a mark-to-market approach for all pension assets and liabilities, although the annual change does not all flow through earnings.

We believe that the adoption of a mark-to-market approach where all benefit payments are discounted at a single corporate bond rate and pension assets are valued at market value at the year end, is not the correct answer. But this FRS 17-like approach is certainly better than the arbitrary smoothing under FAS 87 that distorts the economic realities for long periods of time. A plausible alternative would be to discount the obligation at a rate reflecting the incremental cost to the company (using the curve) and mark-to-market both assets and liabilities but report the annual changes as financial gains and losses. In addition we would encourage disclosure of the sensitivity to rate and return changes to indicate the "value at risk."

Exhibit 10

S&P 500: Estimated Impact on Net Income of Mark-to-Market Returns on Pension Plan Assets, 1997–2002



Sources: Company reports, Morgan Stanley Research

But it is useful to understand the potential impact of an FRS 17-like approach. Exhibit 10 shows the percentage change in annual reported net income from a marking to market of the assets alone (that is, adjusting for the after-tax impact of the difference between actual and expected returns). These numbers probably exaggerate earnings volatility because in some companies, liabilities moving in the opposite direction would smooth earnings (especially if there is appropriate matching). However, most companies' disclosures do not provide sufficient information to distinguish these changes.

These estimates are unlikely ever to materialize because we expect companies to adjust to the reporting regime under which they operate. A full mark-to-market system would induce companies to reduce the "risk" in their investments. In sum, for most years the data in Exhibit 12 represent the extreme of potential adjustments. We see that the median (weighted average) adjustment swings from a positive 11.7% (22.1%) in 1997 to a negative 20.0% (50.3%) in 2002. As the negative returns in 2002 were combined with lower interest rates, the actuarial adjustment from marking the liability to market would have added to the negative impact on earnings, resulting in a median hit of almost 27% and a weighted average hit of more than 67%.

While reemphasizing the exaggeration of these numbers, this change in accounting rules would clearly increase earnings volatility, unless asset allocations or hedging strategies change dramatically. However, we believe investors will not apply a standard "multiple" to the mark-to-market adjustment. Rather, they are likely to be rational and view it like any other matched book of financial assets and liabilities, focusing more on the riskiness of the net amounts than the annual adjustments, and not assuming that unrealized gains and losses continue indefinitely. Hence, no "multiple" will be applied to such gains/losses in pricing the sponsor's equity.

Proposed Regulatory Changes

The second set of missiles relates to responses from various regulatory agencies. One issue is the potential move by the Pension Benefit Guaranty Corporation, (PBGC) a quasi-government pension insurance agency, to charge premia according to the riskiness of the plan based on its asset allocations. The second issue relates to the potential move to a

single long-term corporate bond rate or to an unsmoothed yield curve to replace the current discount rate (a weighted average of 30-year Treasuries) used for ERISA funding purposes.

Gearing PBGC premiums to plan risk is appropriate, in our view. But risk should be measured comprehensively, rather than solely by the share of equities in plan assets, as has been proposed. CIEBA respondents are clearly concerned by this PBGC proposal, based on the fact that 49% of respondents stated that it would affect their asset allocation. But the response may understate the impact of the proposed change. If implemented, plan sponsors of "healthy" plans that have managed their benefits and assets and liabilities to minimize shortfalls and duration mismatches would pay for other sponsor companies' mismanagement (through higher premiums paid to the PBGC). In response, they likely would freeze their DB plans so as not to be "caught" as the insurer of the deficit plans, a move far more draconian than asset reallocation. In contrast with the proposal, we favor comprehensive risk-based pricing that would reduce the moral hazard in the pension safety net. The only reason we can see why healthy companies would not want the PBGC to have true risk-based pricing is that they fear it could trigger bankruptcies and plan terminations Such "adverse selection" would increase the burden on the PBGC, thereby forcing the healthy companies to incur the cost anyway.

The strength of the negative reaction to the proposal to move to an unsmoothed yield curve again was a little surprising to us. Clearly, some of the reaction is to the potential balance sheet and earnings volatility that this change likely would cause, especially if combined with a move to marking to market in financial reporting. However, the intensity of the reaction suggests that many companies have a significant duration mismatch in their plans that will be highlighted with the lower short-term discount rates used with a full yield curve. If this is true, then any move to use a single corporate bond rate without any immunization of the near-term cash outflows could be disastrous for many of the DB plans if the markets do not provide very healthy returns for the next several years, hardly a riskless call. It also brings into question the argument that the obligations are predominantly long-term in nature, as this would mean that the low rates at the short end of the curve would have little impact on the total obligation.

Rating Agency Responses

The final set of missiles relates to rating agency reactions. For many years the rating agencies seemed to pay little attention to the pension obligations in their evaluations of corporate debt. We obviously cannot know why they chose this course, but it is plausible that aggregate surpluses blinded them to the risk that many of the sponsors were taking as shifting demographics were changing the active-to-retiree ratio. This has changed in the last couple of years, in particular for Standard & Poor's, which has made significant adjustments, both in adopting a new approach to its definition of core earnings and in a move to treat the PBO as debt — the latter seemingly also being done by the other major rating agencies, Moody's and Fitch. CIEBA survey respondents correctly dismiss the core earnings issue, in our view, as Standard & Poor's has clearly created a measure with little economic logic that investors are largely ignoring.[8] However, while CIEBA survey respondents seem less concerned about the impact on debt ratings than we had expected, (with 67% indicating that this would have no impact on their asset allocations) we suspect that there will be a lagged effect as companies are required to increase their funding and the rating agencies' bite on riskier plans becomes more evident. We have already seen the rating agencies cite pension issues when putting companies on credit watch or in some cases downgrading their ratings.

In sum, some plan sponsors view many of these missiles as negative and "dangerous." Yet it is unclear whether it is the nature of the cure or its timing that turns them into missiles. For example, if we were starting a DB system from scratch today, few of these issues would be viewed as threatening. On the contrary, many of the proposed changes — such as increased transparency of asset allocation and of estimated future contributions and benefit payments — would be encouraged to ensure economic efficiency and appropriate risk management. That is certainly our view, and to be fair, it is also the view of many DB plan CIOs and their bosses. Yet it is fair to argue that it may be inappropriate to shock a system that has been in place for decades into a new equilibrium over a very short time frame. But inaction won't save the DB pension system.

Impact on Corporate America

DB plans are having a profound impact on Corporate America today as plan sponsors are being forced to inject large amounts of free cash or debt into their plans to overcome the current shortfalls. As we show in Exhibits 7 and 9, the size of contributions has grown significantly in 2002 and is estimated to remain at a higher level than the 1990s through 2001. The new accounting disclosures that require disclosure of the benefits to be paid in the next five years, by year, then years 6–10 in aggregate, and the contributions ex-

Exhibit 11

Missiles' Impact: Plan Sponsor Changes to Equity Allocation

		Percentage point change in equity allocation
1	FASB elimination of smoothing	-9.0%
2	Treasury requires the use of an un-smoothed corporate yield curve	-8.1%
3	PBGC alters premium system so that premiums are based on equity allocation	-7.0%
4	Discount rate process altered to allow use of a single long-term growth rate	-0.8%
5	Rating agencies treat the PBO as "debt"	-7.0%
6	Broad adoption of S&P's definition of core earnings	-5.5%
7	FASB requirement to disclose expected returns	-0.3%
	Collective impact	-12.7%

Note: Includes US and international equity.
Sources: CIEBA Pension Survey, Morgan Stanley Research

pected looking forward at least one year, will help to clarify this. Yet the data also reveal that contributions — while above service cost in 2002 and 2003 (in aggregate at least) — are still less than benefits paid, so that returns on plan assets must contribute to the payment of benefits. To the extent that these payments have to be made in the near term, corporations are continuing to take on short-duration market risk that can bite if economic growth is inadequate.

Depending how companies react, the proposed changes would likely have an impact that goes beyond how sponsors run their plans. Short-term required plan contributions would be larger, and if investment policies remain the same, the volatility of reported earnings would rise substantially. For some companies, the contributions and earnings impact would swamp their operating performance, while for others, the outcome should be far less dire. Either way, gradual but disciplined implementation of funding and investment policy adjustments would buy time for both groups to restore the health of their plans while maintaining the health of their companies — obviously vital for the well-being of current workers, debt holders, and shareholders.

Plan Sponsor Responses to Proposals Indicate Risk Reduction.

The CIEBA survey indicates that DB plan CIOs see these proposals as incoming "missiles" that will be triggers for changing the rules of operation for their plans. The survey strongly suggests that CIOs will respond to some of them by adopting a more cautious asset mix in two important dimensions.

First, in response to the implementation of several of these proposals, plan CIOs would decrease assets allocated to equities and increase their allocation to bonds by a similar dollar amount. Companies would want to reduce equity exposure and increase fixed-income allocations to reduce the extra earnings volatility, higher PBGC premiums, and the wider duration mismatch between plan assets and liabilities that would otherwise accrue under the new proposals. Note that because the typical equity allocation is twice that for fixed income, fixed-income allocations would jump by roughly twice as much in percentage terms as equity allocations were reduced. Note too that the response to the collective implementation of all proposals is far smaller than the sum of the individual responses, because each additional proposal has a successively smaller impact.

Exhibit 11 summarizes the asset allocation changes respondents would make in response to each proposal separately, and to the implementation of all seven proposals collectively. The responses are presented in terms of percentage point reductions in equity allocations; for example, elimination of smoothing would likely trigger a 9 percentage point reduction in equity exposure.

Implementing four of the seven proposals would significantly shift asset allocation from equities to bonds (with a 5–6% reduction in equities), according to the survey. (It's worth noting that the survey results were meant to characterize such shifts under normal market conditions, e.g., with real interest rates closer to their historical means, and not necessarily under today's market conditions.) Small wonder: These are the "missiles," such as eliminating the smoothing for income reporting purposes of pension portfolio gains and losses, that would have the largest impact on plan sponsors' income statements and balance sheets. *The seven missiles collectively might trigger a 12.7 percentage point (22.2%) reduction in equity allocation — and a 45% increase in assets allocated to fixed-income securities. Given that private DB plans hold roughly $900 billion in equities, such a shift would reallocate $200 billion between the two asset classes.*[9]

Exhibit 12

Duration Policy: Plan Sponsor Responses to Missiles

Impact Duration Policy	Eliminate smoothing	'Collective'
No	63%	53%
Yes	37%	47%
If Yes, Increase	89%	100%
1-4 Years	12%	15%
5-8 Years	69%	52%
+8 Years	19%	33%
Mean increase (years)	6.7	7.1
If Yes, Decrease	11%	--
1 - 4 Years	50%	--
5 - 8 Years	50%	--
+8 Years		--
Mean increase (years)	4.5	--
Net increase (years)	6.4	7.1

Sources: CIEBA Pension Survey, Morgan Stanley Research

The second dimension of the reaction, detailed in Exhibit 12, would also be profound: In response to the smoothing proposal, more than one-third of CIOs would change their duration policy (indicated in the second row of the table). What's more, those CIOs making the change would increase bond portfolio duration by a whopping 6.4 years, more than doubling the current duration of 5.75 years. And the seven missiles collectively would trigger a 7-year increase in duration, to nearly 13 years (see the last row of the table). *Given that CIEBA respondents indicate that the average duration of their US PBO is about 11–13 years, such an increase seems entirely appropriate regardless of whether the proposals are implemented. No doubt, such changes would increase the volatility of the typical DB portfolio, but they would more closely match the duration of assets and liabilities.*

The management of risk and duration, especially in a period of transition, does not all have to occur in the instruments themselves. A variety of strategies using derivatives allow plans to manage their risk profiles without disrupting short-term flows. While the current scope, size and breadth of some derivatives markets pose practical obstacles to such a massive undertaking, increased demand and a relaxation of the restrictions on how pension trustees seek advice would likely provide a solution that would ease any transition. Furthermore, as investors and rating agencies increasingly view the pension obligation as part of corporate debt, a move to fixed-income investments can be value-accretive for investors (while providing increased safeguards for employees and retirees) if companies simultaneously issue bonds and repurchase their own equity.[10]

Ideally, plan CIOs should separate their asset-allocation decisions from their bond-duration decisions, because the first relate to the funding of current versus future retirees, while the second relate to how to fund the obligation to current retirees. Taken together, however, these changes would effectively move a significant sum into long-duration bonds. The combination would dramatically reduce the risk profile of private DB plans and "immunize" a large portion of their current ABO. The conundrum of course is that most plans don't have enough assets to match or immunize their liability. In addition, as discussed below in greater detail, an abrupt shift in asset allocation/duration could trigger significant asset price swings, reflecting the current limited supply of long-duration bonds (for example, there is $400 billion of outstanding Treasury debt with current maturities greater than 10 years). However, as noted below, a significant step-up in the demand for long duration debt would probably bring new supply, at least from private issuers.

This asset allocation shift would itself have an impact on reported pension costs and operating earnings as expected, and presumably actual returns would be lowered. The primary shift would occur in the year of transition: Our estimates suggest this would reduce aggregate operating earnings by around 2% for the companies in the S&P 500, depending on the size of the adjustment and the assumptions used for actual/expected returns.[11]

That's not the end of the story, however. State and local government DB plan sponsors will be watching the private plans' asset allocation moves with great interest, since in all likelihood they will be required to follow suit. *State and local plan holdings of equities are nearly double those of private plans. If both reallocated 22.2% of their equity holdings into bonds, such sales would amount to nearly $600 billion, or 3.7% of US equity market capitalization.* We assume that private and state and local plans spread their sales out over a multi-year period, as indicated in the survey. We also assume that state and local plans would follow private plan sponsors' asset allocation and duration decisions with a three-year lag, but we also explore the case in which they follow suit immediately. Exhibit 13 depicts potential paths of equity sales from private and public plans for the "collective" scenario under these assumptions (we don't separately calculate such paths for each missile, as the net effect of each is much smaller).

Exhibit 13

Sales of Equities: "Collective" Scenario

(Billions of dollars)

	Total	2004	2005	2006	2007	2008	2009	2010	2011	2012
Sales by private DB plans of domestic equities	145	64	36	36	3	3	3			
Sales by private DB plans of foreign equities	59	26	15	15	1	1	1			
Sales by state and local plans	377				166	94	94	8	8	8
Total equity sales	582	90	51	51	170	98	98	8	8	8
Addenda										
Domestic sales as share of US market cap	3.7%									
Foreign sales as share of foreign market cap	0.4%									
Sales as share of global market cap	2.1%									

Sources: CIEBA Pension Survey, Morgan Stanley Research

Beyond changes to asset allocation, the responses to the survey suggest that in some cases, the proposed changes might trigger a significant backing away from DB plans. Sponsors might freeze plans for existing and/or new participants. In the first case, freezing a plan for existing participants would save sponsors from accruing deferred compensation, but they would still be responsible for all benefits accrued to date. Thus, such a move also would have critical implications for asset allocation because the time profile of the plan's cash distributions (in the ABO) would shorten considerably and would be more certain. Freezing a plan thus would probably promote an even quicker move from equities to bonds, and thus a more precise matching of duration between assets and liabilities.

By comparison, eliminating new participants from an ongoing plan would still leave aging active participants in the plan, with asset allocation implications somewhere in between current practice and a full freeze. It's worth emphasizing that — apart from tax considerations, which could have an important bearing on capital structure — moving asset allocation to 100% bonds makes little sense for a going concern. Allocation of some plan assets to equities covers the "long tail" of the plan's PBO from future and even yet-to-be hired retirees in perpetuity. For a going concern, equities can also hedge the inherent uncertainty of future payments in the PBO. For the individual plan sponsor, extending bond duration and reducing equity exposure can also be done through derivatives.

When contemplating the impact of freezing DB plans, it is always important to incorporate the likely increase in alternative compensation, in the form of either a defined contribution plan or higher cash compensation. Anecdotal evidence suggests that employees trade off pension and healthcare benefits for other forms of compensation, so an elimination of DB pensions requires some payback to employees. Most alternatives require companies to pay earlier, exaggerating the short-term negative cash consequences, as both DC and cash compensation are paid out almost immediately as earned, while DB funding is currently often deferred. It's worth noting that individuals would thus be much more reliant on their own resources to manage their retirement nest eggs.

Clearly, plan sponsors who see the handwriting on the wall may make all these changes regardless of any changes mandated by the authorities. But the incoming missiles would likely accelerate the process.

Guessing the Impact on Asset Prices

In theory, this reallocation of funds from one asset class to another should produce small, temporary, and offsetting moves in stock and bond prices. The reallocation, including that from state and local funds, probably would be large enough in relation to the overall size of equity and debt markets to reduce stock prices and flatten the yield curve. The doubling (or tripling) of bond duration would further flatten the curve, the more so because the supply of long-duration debt is currently limited. As a result, plans seeking duration might well turn to derivatives to increase duration synthetically. In practice, however, several factors seem likely to affect the impact.

First, if the reallocation and duration extension were phased in over a multi-year period, the market impact of even such a large portfolio rebalancing move — including shifts in state and local government plans — likely would be swamped by more fundamental factors, such as inflation, growth, and monetary policy. The so-called "technical" factors of supply and demand typically magnify, but do not overwhelm, those fundamentals. In addition, knowing that it was coming, market participants would likely anticipate the rebalancing and adjust portfolios accordingly, and per-

haps more quickly than we assume. For example, assuming that state and local government retirement funds follow suit, we estimate that the gradual rebalancing could temporarily reduce equity prices by 8–12% and flatten the yield curve by 35–60 basis points in the first few months following implementation, based on the size of today's markets. Continued equity sales to rebalance portfolios — even if known to market participants — might overhang the market and permit only a gradual rebound in prices or yields. The allocation of new DB contributions primarily to bonds could contribute to that effect.

Third, however, the more abrupt the rebalancing move, the more dramatic the price action would be while it occurred, and the swifter the ensuing rebound in prices toward values dictated by fundamentals. Issues of market liquidity in both cash and derivatives markets come into play in thinking of a massive rebalancing in a relatively short period of time. In a second alternative, therefore, we assume that implementing abruptly the "collective" scenario would temporarily reduce equity prices by 10–15% and flatten the yield curve by 75–150 bp. This magnified, nonlinear response reflects market dislocations that could follow such an abrupt move.

Exactly what the reaction might be under such circumstances is far from clear, however. Some think that such an abrupt reaction would be akin to forcing a "fire sale" of assets at the bottom of the market — like the forced liquidation of European insurance company equity holdings in 2002, or the forced sales of high-yield debt by thrift institutions in 1989 following FASB's change in the accounting treatment of such bonds. We believe that the analogy is imperfect. In those earlier episodes, institutions were forced to sell assets; in this case, however, we are assuming that CIOs are merely choosing to be — appropriately — more conservative in response to changes in circumstances, and that the proposed changes in rules and regulations are the catalyst. As a result, the market reaction to implementation seems likely to fall far short of those in the two scenarios we have outlined.

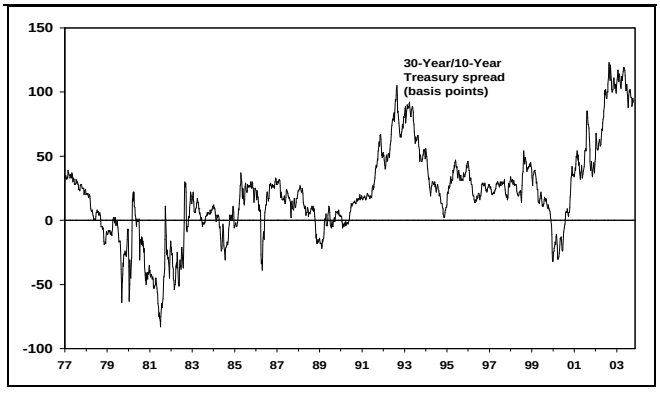
Likewise, while the reallocation to bonds from equities and the doubling of DB bond portfolio duration will significantly flatten the yield curve, we believe that comparisons with the impact of the 1997 Minimum Funding Requirement on the Gilt yield curve in the United Kingdom are inexact. The MFR was a much more comprehensive mandate than the proposals now on the table in the US. Nonetheless, we are highly sympathetic to the notion that under current circumstances, these changes would flatten the Treasury yield curve dramatically.

Fourth, however, the impact also depends importantly on how corporations and governments act to change the supply of bonds and equity. For example, the British retailer Boots went beyond shifting plan assets from equities to appropriately matched bonds. The company also changed its balance sheet by issuing bonds and repurchasing equity, thus in some sense reestablishing an equivalent "net" exposure, thus taking advantage of a tax arbitrage opportunity. If plan sponsors and state and local governments issue debt on their own balance sheets to reflect and measure more precisely the PBO, and corporations repurchased their own equities, these changes in the supply mix would mute the decline in equity prices and yields.

In that regard, it is tempting to speculate that the implementation of these proposals would offer the Treasury's debt managers an opening to resume bond issuance. A step-up in bond supply could significantly offset the flattening in the yield curve that the reallocation to bonds and duration extension would otherwise induce. Arguably, a dramatic shift in the maturity composition of government supply toward bonds would facilitate what would otherwise represent a major scramble for duration by plan sponsors and others. The debt managers aren't likely to see the picture in those terms, however. Regular and predictable auctions have served them well over the years, and they need a compelling reason to alter the maturity profile of debt issuance. With the spread between 10-year and 30-year yields at a still-wide 88 bp (as of January 16, 2004), close to the recent record, issuing bonds would be expensive and counterproductive. If the scramble for duration narrowed that spread significantly, Treasury officials then — and only then — might be inclined to listen.

Exhibit 14

Spread Between 30-Year and 10-Year Yields



Source: Federal Reserve. As of January 16, 2004

Macroeconomic Impact

What would be the likely macroeconomic fallout from these asset price moves?

In our view, these crosscurrents in asset prices are unlikely to have a major impact on the economy, for two reasons. First, even a perceptible decline in equity prices would only nick the economy; and second, lower bond yields would offset the impact of lower stock prices on economic activity.

Those factors are illustrated in simulation exercises aimed at approximating the impact of the "collective" scenario on the evolution of the economy. The first exercise, illustrated in Exhibit 15, shows that the impact of even the most dire scenario on growth, inflation, and employment would amount to only a few tenths of a percentage point.[12] Note that the initial decline in GDP reflects a quicker depressing effect from falling stock prices than the boost from falling bond yields. That gives way to a slightly positive effect after four years. In turn, that is the product of our assumption that the rebalancing into bonds slightly but permanently lowers yields, but that stock prices rebound after the selling abates.

In the second exercise, shown in Exhibit 16, we add the duration extension to the rebalancing scenario. Again, the effects of this move on the economy are relatively small.

More interesting and much harder to assess would be the effects of freezing DB plans and the impact of pension contributions on corporate cash flow and thus capital spending and hiring. As pensions are deferred current compensation, we expect that in any such freeze, DB plans would be replaced by a DC alternative or simply increased salary/wage levels. This loss of perceived permanent income could produce a much more significant shortfall in economic activity than in the rebalancing scenarios, but we have no way to measure the impact.

The good news on this score is that the expected macroeconomic impact of these scenarios probably would be limited. Only one-fifth of the private workforce is currently covered by DB plans, so even if every active participant in response to the perceived wealth loss doubled his/her saving out of current income and curbed consumption by a like amount, such retrenchment might trim overall economic growth by about half a percentage point. And not all CIEBA respondents say that they would freeze accruals or new entry even in response to all missiles fired. On a weighted average basis, about 27% might freeze accruals, while 35% might freeze entry of new participants in response to these changes collectively.

But freezing accruals or new entrants would not let sponsors off the hook. Even a frozen DB plan must fund the existing accrued benefits, so shortfalls and mismatches would bite into current cash flows more deeply in the early years of any switch. That would be especially true if the advent of the missiles and related actions reveal bigger funding shortfalls and funding rules require large contributions in a short time frame. Sizable contributions in turn could limit cash flows available for investment needs, with further macro spillover effects. As a result, the reaction of plan sponsors will dictate the ultimate outcome.

Exhibit 15

Economic Impact of "Collective" Rebalancing Scenario

Percentage point difference from baseline scenario

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Real GDP	-0.1	-0.3	-0.5	-0.4	0.1	0.4	0.7	0.8	0.8	0.7
Prices*	0.1	0.1	-0.1	-0.5	-0.8	-1.1	-1.2	-1.4	-1.4	-1.4
Unemployment rate	0	0.2	0.3	0.3	0.1	-0.1	-0.2	-0.3	-0.2	-0.2

** Consumer price index*

Source: Morgan Stanley Research

Exhibit 16

Economic Impact of "Collective" Rebalancing and Duration Extension Scenario

Percentage point difference from baseline scenario

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
Real GDP	0	-0.1	-0.2	-0.1	0.2	0.5	0.7	0.7	0.6	0.5
Prices*	0.2	0.4	0.1	-0.4	-0.8	-1.1	-1.2	-1.4	-1.4	-1.3
Unemployment rate	0	0.1	0.2	0.2	0	-0.1	-0.2	-0.2	-0.1	-0.1

** Consumer price index*

Source: Morgan Stanley Research

Either way, the legacy costs as a result of past actions create a real cost disadvantage for these US corporations: Benefit costs, including pension contributions and healthcare insurance premiums rose by 6.5% in the year ended September, 2003, when they amounted to 28.4% of hourly compensation. In contrast, governments in many other countries provide such benefits, so the taxpayer bears both their costs and risks.

But using hindsight to place blame is pointless. The partners, plan sponsors, their owners, employees, and retirees, as well as the implicit government guarantors, all need to cooperate in finding a solution. The missiles do not change the underlying economic reality, so the real macro impact is a question of timing and managed response. Both moving too fast and not moving at all will have a negative impact on the US economy.

Conclusion and Recommendations

The corporate DB system should remain a key element in our country's long-term system for retirement savings. Market conditions over the past three years have exposed weaknesses in the DB system that should be carefully addressed. Neither regulators nor plan sponsors should overreact to the circumstances of the immediate past; in all likelihood, the worst of the pension funding shortfall has passed. Thus, a balanced approach to reform is critical. At the same time, neither regulators nor plan sponsors should let today's improved market conditions renew complacency about DB plans' health. With unfavorable demographics, for any level of risk appetite, DB plans are simply going to cost more than previously thought. And the cost of increased benefit promises needs to be rethought. DB plans' underlying obligations and funding will require that plan sponsors adjust their thinking. The future of the DB system depends on carefully implementing appropriate reforms that ensure that plan sponsors act promptly to adequately fund the promises made while taking on prudent economic risks.

While the macroeconomic impact of these proposals, if implemented, as a result of changes in stock prices and bond yields alone is likely to be small, the effects on the defined-benefit pension system will be substantial. Indeed, the future of the system now hangs in the balance and will depend not only on whether the proposals examined here are implemented, but more importantly, on whether plan sponsors act promptly to balance the economic risk in their plans with realistic return objectives.

Hence, while we believe that transparency is a big step forward, we are less focused on endorsing one or more of these missiles as cures for the DB system's ills, and more on exhorting DB plan sponsors to address the fundamental issues. In any case, additional accounting changes are likely to be phased in, and they will not hit until 2005 or 2006, given the FASB's current timetable. But the correct long-term solution is not to argue about the right discount rate and whether to mark assets and liabilities to market but to show the matched book over time. As the regulatory proposals now stand in Congress, the Senate version offers a two-year grace period followed by punishment for failure to comply, while the House version carries no penalties for failure. We strongly believe that any remedies that carry the carrot of a phase-in will only be meaningful if they also carry the stick of penalties for failure to reduce plan risk.

But we see no alternative. The key lesson from the past is that had Corporate America funded the DB system appropriately over the past decade, the massive cash infusions that plans now require would not be needed. In contrast, maintaining the status quo today in our view condemns the DB system to another funding crisis at some point in the future.

Appendix

Exhibit 1

Disclosures Under Current FASB Rules

Measure	Description
Income Statement	
Service Cost	Increase in obligation arising from employees' service during the period
Amortization of Prior Service Costs	Cost of adjustments to pension benefits from new labor contracts
Interest Cost	Reported obligation multiplied by the discount rate
Expected Return on Plan Assets	Value of plan assets multiplied by company's assumed expected return
Recognized Net Actuarial Loss/(Gain)	Recognition of "smoothed" gains/losses from changes in discount rates, actual vs. expected returns and other actuarial adjustments
Curtailments, Settlements, And Other	
Net Pension Cost in Operating Expense	
Balance Sheet Items	
Projected Benefit Obligation (PBO)	Present value of expected payments based on projected salary levels.
(beginning of period)	
Service Cost	As above
Interest Cost	As above
Amendments and Actuarial Losses/(Gains)	Changes arising from adjustments to actuarial assumptions
Benefits Paid	Payments made to retirees
Projected Benefit Obligation	
(end of period)	
Fair Value of Plan Assets	Assets set aside to meet the obligations to employees, adjusted to current values
(beginning of period)	
Actual Return on Plan Assets	Actual returns earned on plan assets
Employer Contributions	Cash contributions paid by the plan sponsor
Benefits Paid	
Fair Value of Plan Assets	
(end of period)	
Actuarial Assumptions Used for Pension Estimates	
Discount Rate	
Expected Rate Of Return	
Rate Of Compensation Increase	

Source: Morgan Stanley Research

Exhibit 2

Additional Disclosures Under FAS 132 Amended

Plan Assets:

- Major categories of actual asset classes (e.g., equity securities, debt securities, real estate, other)

Plan Obligations:

- Accumulated benefit obligation (excludes projected salary increases in PBO)
- Expected future benefit payments for each of next five years and for years 6–10 in the aggregate
- Best estimate of aggregate expected contributions for the next fiscal year

Other Disclosures:

- Description of investment strategies and policies employed including: target asset allocations, if used, and other pertinent factors such as investment goals, risk management, allowable and prohibited investment types, including the use of derivatives, diversification, and relationship between plan assets and benefit obligations
- Further breakdowns of plan assets if useful to understand market risks and expected long-term rate or return
- A description of the basis used to determine the overall expected long-term rate of return on assets assumption
- Assumptions used to determine the benefit obligation and (separately) net periodic cost
- Measurement date, or dates, used that make up at least the majority of plan assets and benefit obligations

Source: Morgan Stanley Research

Notes

[1] We do not think that all investors ignored the risks, but see Julia Coronado and Steven Sharp, "Did Pension Plan Accounting Contribute to a Stock-Market Bubble?" *Brookings Papers on Economic Activity 1: 2003*, ed. William C. Brainard and George L. Perry (Washington, DC: Brookings Institution, 2003), for evidence that investors in the 1990s failed to distinguish between operating and pension-generated income.

[2] CIEBA surveys of its members from 1992 to 2002 show pension payouts growing from $27 billion in 1992 with 105 respondents to $54 billion in 2002 with 104 respondents. The payout peaks in 2000 at $57 billion but that was with 119 respondents, so is not really comparable with the 2002 numbers.

[3] See Richard Berner "Future Investment Returns and Social Insurance" in *The Future of Social Insurance: Incremental Action or Fundamental Reform?* Peter Edelman, Dallas L. Salisbury and Pamela J. Larson, eds., National Academy of Social Insurance, Washington, D.C., 2002

[4] Some pension specialists argue that the accumulated benefit obligation (ABO) is more relevant than the PBO as a summary measure of the obligation. There are pros and cons to both arguments but more than 80% of the companies that responded to the CIEBA survey have a PBO/ABO ratio = 1.1 so we focus on the PBO number.

[5] Many companies do not split their US and non-US plans in published financial statements. Where this split is given we use only the US data but we are aware of several cases where the non-US plans distort the size of the deficit (e.g., Procter & Gamble). We believe that on average the non-US plans are likely to increase deficits and reduce surpluses in the S&P 500 data.

[6] Our early *Apples-to-Apples* reports published in 1997/1998 pointed out many of these issues, but we found little traction with investors, who continued to focus on EBITDA-based measures in sectors like telecoms.

[7] New standards put out by the International Accounting Standards Board (IASB) are now known as International Financial Reporting Standards (IFRS).

[8] In a report we put out when S&P first announced this measure, we showed it did not make sense.

[9] These estimates are from Morgan Stanley's Pension Strategies Group and differ from those published in the Federal Reserve's Flow of Funds Accounts.

[10] This was the strategy adopted by Boots PLC when they changed their asset allocations prior to the imposition of FRS 17 in the UK.

[11] We assume a 10% return on equity and 6% on bonds in this calculation.

[12] We carried out these exercises with the Macroeconomic Advisors' forecasting model of the US economy.

Hewitt

Hewitt Associates LLC

Response to CIEBA Request for Impact Analysis of Emerging Issues

Ari Jacobs, F.S.A.
and Mike Johnston, F.S.A.

March 12, 2004

The voluntary private employer defined benefit system in the United States is under attack. Current legislative and regulatory proposals, as well as recent judicial rulings and potential accounting changes, are forcing employers to question their ongoing commitment to these plans. While significant barriers to entry exist, exiting is simple even though it is costly to individuals and ultimately the economy. Large employers (those with 1,000 or more employees) are at a crossroad and forced to make decisions in an environment of tremendous uncertainty and ambiguity.

Why are defined benefit plans so important?

Defined benefit plans remain a critical part of the U.S. retirement system. The best private retirement programs combine defined benefit and defined contribution plans to give employees the advantages offered by both sources. From Hewitt's 2003 survey of over 1,000 large employers, 68% provide both of these benefits to their active employees. From recent PBGC statistics, over 34 million Americans participate in private defined benefit plans.

While over the last few years we have seen a rise in "hybrid" defined benefit plans such as cash balance plans (approximately one-third of plans are hybrid plans), the same reasons exist for sponsoring defined benefit plans—the ability to group and transfer risks and retirement costs from the employee to the employer. On their own, defined contribution plans cannot provide the same retirement security that a combination of defined benefit and defined contribution plans can. That's why Social Security remains a defined benefit and is complemented by individual savings through vehicles like Individual Retirement Accounts and 401(k) plans.

Defined benefit plans provide core retirement security

Defined benefit plans are designed as core retirement programs. No forms or elections are needed to join. Participants do not need to manage their investments. Few plans require employee contributions. Generally longer vesting requirements and benefit accrual patterns allow cost to be allocated to longer service employees for retirement. And, few employees have a similar benefit structure on an individual basis beyond what they receive from Social Security.

Nearly all defined benefit plans are fully paid by the employer. From Hewitt's 2003 study, only 2% of employers require contributions to join their plan. In contrast, many defined contribution plans require employees to contribute a portion of their pay in order to receive the benefit. Yet, only 76% of employees participated in their defined contribution plan in 2002, leaving a material number of employees underutilizing their benefits. Also, the incidence of participation is directly related to pay levels—employees earning less than $40,000 only participate at a 59% level and generally contribute about 3% less than those earning in excess of $40,000.

Transfer of investment risk and greater investment returns

Many risks are transferred from an individual to an employer under a defined benefit plan, including, most notably, investment risk. Beyond the risk transfer, defined benefit plans are generally invested more effectively. Here are some reasons why:

- According to a 2001 Dalbar, Inc. study entitled "Quantitative Analysis of Investor Behavior," individual investors (which includes 401(k) investors) achieved only a 5.2% average return over the period 1984 to 2000. During this same period, the stock market, as measured by the S&P 500, increased at a compound rate of 16.3% per year. This difference is attributable to a number of factors, including poor market timing by individuals.

- Defined contribution plans often require or entice employees to invest substantial portions of their total assets in employer stock. This lack of diversification significantly increases the risk profile of the individual employee.

- Defined benefit plans are managed by experts and have the advantage of pooling much larger sums of money to more efficiently balance risk and return. Even as employee investment and savings education improves, the average employee is still not in an equal position to make the same choices as the professional investors responsible for these significantly larger defined benefit funds.

- Employees' defined contribution balances tend to be less diversified than employers' defined benefit plans assets. From a 2002 Hewitt study entitled "How Well are Employees Saving and Investing in 401(k) Plans":

  — 8% of employees have no equity investments and 16% have only one equity investment in their portfolio;

  — 18% of employees hold only one fund in their account; of those holding only one fund 37% hold only company stock and 31% hold only GIC/stable funds;

  — 17% of employees hold just one asset class and 22% of employees hold just two asset classes;

  — Of those that hold company stock in their portfolio, stock averages 42% of the employee's total balance; and

  — Lower paid employees are even less diversified, with those earning less than $40,000 invested primarily in short-term fixed income or balanced funds, well below both the average of those earning more than $40,000.

- Defined benefit plan sponsors have the opportunity to invest under a much longer time horizon. Since the plan is an ongoing entity with participants constantly joining and leaving, the plan sponsor can invest assets as if the plan will effectively exist in perpetuity. The importance of time horizon on investment return is easy to demonstrate. Based on mainstream assumptions as to expected returns by asset class and the impacts of diversification, a typically diversified defined benefit trust might be expected to have the following distribution of returns, based on various time horizons:

	Rate of Return at a Given Confidence Level				
Time Horizon in Years	**95th Percentile**	**75th Percentile**	**50th Percentile**	**25th Percentile**	**5th Percentile**
1	-12.13%	-.031%	8.83%	18.81%	34.79%
3	-3.82%	3.45%	8.83%	14.48%	28.13%
5	-1.10%	4.64%	8.83%	13.18%	19.75%
10	1.71%	5.85%	8.83%	11.89%	16.45%
20	3.75%	6.71%	8.83%	10.98%	14.16%

- Furthermore, defined benefit plans can be structured with a greater appreciation of and emphasis on total portfolio risk. Plan sponsors have the opportunity to invest in alternative assets, such as private equities, real estate, and hedge funds, which offer a greater opportunity to use risk effectively to deliver larger returns.

Financially, a company is only willing to devote a fixed amount of resources to providing employee retirement income. Over time, then, the amount of retirement income available to retirees is constrained by the employer commitment and the resultant investment returns. During the 1990s, large investment returns resulted in contribution holidays; effectively, companies were able to provide a zero cost benefit and employers had no real reason to change benefit structures. Currently, with the reductions in funded level caused by recent market events, companies are again faced with defining their long-term commitment and, in many cases, are redefining the benefit structure that they believe the commitment can support.

Given the likelihood of superior returns from a defined benefit plan, the benefits provided under a defined benefit structure can ultimately be larger than if the comparable employer cash was put into a defined contribution plan. For example, if an employer is willing to commit 5% of pay to a retirement program, then for every extra 25 basis points of long term investment returns, an additional 6% in retirement benefits can be provided. If the difference is 100 basis points, the increase could be nearly 25%, which translates to a benefit equal to about one-year's worth of pay at retirement.

The graph below shows how the funds available to pay benefits grow with either a 25 and 100 basis point difference in investment returns. An extra 100 basis point return increases the available benefits as a percent of pay from 399% of pay to 504% of pay.

Combined defined benefit and defined contribution plans generally offer higher retirement benefits

Further, as employers shift from a combination of defined benefit and defined contribution to a defined contribution only program, the resulting program often offers lower retirement income than the previous combined program did. In some cases, this is to be expected because the company making the shift is financially weak and looking to cut costs. These new benefit programs generally yield smaller retirement benefits, even after discounting for the additional value from the larger investment earnings. At the same time, defined contribution only programs provide larger benefits to people who terminate before retirement. If the employer's objective is to spend the same amount of money, the conversion to a defined contribution only program trades some retirement income for extra value provided to terminated employees. This philosophical shift is frequently due to HR and business goals that focus more on the mobility of the workforce than longer career benefits.

The table below compares illustrative employees under a typical traditional program that includes both defined benefit and defined contribution benefits (1% final average pay and 3% defined contribution) versus a typical program that only offers defined contribution benefits (7% defined contribution).

Sample Employee	Ratio of Value of Age 65 Benefits from DC Only Program to Combined DB/DC Program	Ratio of Value of Age 65 Benefits When Program Changes Five Years after Date of Hire
Age 30	**83%**	**76%**
Age 40	**75%**	**69%**
Age 50	**67%**	**68%**
Age 60	**60%**	**100%**

Two results should be taken from the table above:

- DC only programs offer lower retirement benefits as compared to similar cost combined DB/DC programs at virtually all ages and particularly less valuable retirement benefits for older employees that do not get the advantage of the value in the earlier years.

- Changing from a combined DB/DC program to a DC only program mid-career leads to a further reduction in benefits, especially for employees in their 30s and 40s. DC only programs tend to build up relatively larger benefits at the beginning of a career as compared to combined DB/DC programs. Therefore a mid-career shift catches the employee on the less valuable side of both programs—earning a DB benefit when they are younger and a DC only benefit when they are older.

Transfer of non-investment risk

Beyond investment risk, defined benefit plans provide employees with protection against a series of other risks including:

- ***Longevity or aging risk*** is limited through the availability of life contingent annuities as the base benefit payout form in defined benefit plans. Even as some defined contribution plans offer annuities, 95% of employees elect a single sum payment from their plan. While the opportunity for portability is one of the advantages of defined contribution plans, taking a retirement benefit in one payment rather than as an annuity jeopardizes an employee's ability to have sufficient income as he or she ages.

- ***Morbidity risk*** is frequently reduced in a defined benefit plan by the common practice of offering disability benefits and early retirement subsidies that allow the less healthy to retire earlier without a large penalty.

- ***Inflation risk*** is eliminated during employment under a final average pay or inflation adjusted flat dollar amount formula—still more than half of defined benefit plans have one of these mechanisms. And while few defined benefit plans offer automatic post-retirement cost-of-living adjustments, the opportunity exists if inflation increases significantly.

A Brief History of Pension Plans

One of the earliest "pension plans" was an arrangement set up by Andrew Carnegie in the early 1900s to provide pensions to disabled employees of his steel mills. The trust was funded by a one-time donation of bonds given by Carnegie. There was no notion of ongoing funding; instead, the trustees had to manage pension payments in relation to the size of the trust and the income thrown off by the corpus.

As pensions developed over the next 50 years, the primary purpose of the plans remained the provision of pensions only to those employees who actually retired from the company. While it became increasingly popular to provide some kind of preretirement vesting, the concept of protection of retirees and employees beyond the funds invested was foreign. Most companies either assumed or explicitly said that their obligation was only to the extent of the funding to date. In this sense, companies were indifferent from a risk perspective between defined benefit and defined contribution plans. When plans terminated, assets were typically allocated first to retirees and then to vested employees. If the assets didn't suffice, the obligations were reduced proportionately to match assets.

In the 1960s, both because of tax law and practice, it became common to fund normal costs and amortize any unfunded liabilities over very long periods (sometimes 30 or more years, and sometimes just interest only). Accounting was based on the amount contributed in a year. However, even as funding became somewhat more formalized, the obligation of the employer to a terminating plan was limited to the assets already committed to the trust.

During this decade, several fairly large companies, including Studebaker, liquidated without enough assets to cover obligations. The resulting public concern led to the passage of the Employee Retirement Income Security Act in 1974. This law changed the nature of defined benefit plans in several important ways:

- Vesting—The formalization of vesting changed the nature of pension obligations by explicitly giving active employees a right that survived separation of service from employment and plan termination.

- Funding—Funding rules became much more rigorous. Amortization periods were shortened dramatically, particularly for gains and losses.

- Plan Termination Insurance—The Pension Benefit Guaranty Corporation (PBGC) was an afterthought in the ERISA deliberations. However, it arguably has had the greatest impact on funding and employer obligations. The creation of the PBGC added a pension right that clearly survived plan termination and extended beyond the assets in the trust. And, because the PBGC was financed by employers who had pension plans, it caused some level of employer desire for faster government required funding under the theory that "my company might be responsible, but others may not."

Faster and higher funding and the creation of the PBGC with its resulting claims of plans against employers was at least one impetus for the Financial Accounting Standards Board to more formally recognize the liability of pension plans upon corporations. While the FASB diverged from the formal definitions of pension liability, FAS 87 eventually called for pension cost to be determined using relatively short amortization periods and the recognition of a balance sheet liability if the plan is significantly underfunded through a charge to equity.

The creation of the PBGC also had another unforeseen effect. Where the government once was interested only in making sure that employers did an "adequate" job of funding plans, the potential for the PBGC to absorb liability from terminating plans changed the government's view from one of relatively benign oversight to one of "protect the PBGC at any cost." This has been played out in many ways. Legislative changes in1987 (the Pension Protection Act of 1987,part of the Omnibus Budget Reconciliation of 1987), and then again in1994 (the Retirement Protection Act of 1994,part of the General Agreement on Tariffs and Trades Act of 1994), tightened funding requirements and introduced amortizations that were proportional to the level of underfunding on a quasi plan termination basis. Interestingly, the employer community was relatively accepting of these more rapid funding requirements, perhaps because of the communal nature of PBGC funding and the penalties to underfunded plans through the PBGC variable premiums.

While more rapid funding rules had little impact because of the bull markets in the 1990's, the rules set the stage for the so-called "perfect storm" of the last several years. The combination of very low interest rates – which inflated the size of plan termination liabilities—and the dramatic stock market decline, resulted in the current panic about pension funding.

What is interesting about the current environment is that people—clearly the public and Congress, but also many plan sponsors—have come to believe that pension plans need to be fully funded at all times. Any amount of underfunding is, in this view, a risk to either employees or to the PBGC (and, since the U.S. Treasury ultimately stands behind the PBGC if employers can't or don't fund PBGC shortfalls, the overall budget deficit of the country is ultimately influenced).

So, Why Haven't Employers Staged a Mass Exit from the Defined Benefit System in the Past?
The pension system has weathered various negative regulatory changes in the past. Yet, most of these changes have resulted in a relatively small decline in the number of pension plans sponsored by large companies. Although there are frequent reports of an overall decline in the number of pension plans, the primary source of this decline occurred mainly in defined benefit plans sponsored by small employers (i.e., under 100 employees). Among large employers, while there has been a decline, it has been less severe and many of the changes relate to new companies moving into the large company category. For example, in 1991, 90% of the Fortune 500 had defined benefit plans, but by 2002, this number declined to about 75%. In terms of coverage, the number of people covered by the defined benefit system has actually increased, from 31.9 million in 1991 to 34.4 million in 2001 (although the number of active employees covered by these plans has declined somewhat, from 26 million to 23 million).

The advent of ERISA, as mentioned above, added significant burdens, both financial and administrative, to the operation of pension plans. Over the next 20 years, however, regulation and legislation only caused somewhat incremental changes to the burden of operating a plan. However, the cumulative impact of these changes was relatively substantial, including:

- The addition of variable rate PBGC premiums and substantial increases in overall PBGC premiums. Under ERISA, the PBGC premium had been set at a flat $1.00 per participant. Over the years, the flat rate premium has risen to $15.00 per participant and a variable rate premium has been added that calls for a contribution at the rate of 0.9% of unfunded vested liabilities (which are calculated at a very low interest rate),

- Complicated nondiscrimination rules. Congressional concern over perceived abuses of pensions (either as tax shelters for small firms or as executive perquisites at large firms) led to the eventual promulgation of very complicated numeric tests that caused many companies to either reduce pensions paid to higher paid employees or increase those paid to lower paid employees, and

- Faster vesting requirements. ERISA required vesting after ten years of employment. Subsequently, the requirement was changed to require five year vesting, effectively increasing the number of people who receive benefits apart from the retirement purpose of the plan. This requirement was also one of many that made administration, and the risks of noncompliance, that much more expensive to employers.

The many cumulative straws were not significant enough to break the camel's back.

Many predicted that FAS 87 (issued in 1985) would cause significant numbers of employers to abandon plans, yet the strong market that occurred just prior to the implementation of the new standard actually created good news—pension income—due to the recording of transition assets.

The strengthening of funding requirements in the mid 1980s and again in the mid 1990s also caused a few employers to leave the system, but once again, a strong stock market made these provisions less problematic.

Perhaps one of the most severe disincentives for employers to maintain defined benefit plans were the changes in the plan termination rules in the Revenue Reconciliation Act of 1990. Effectively, these changes required terminating plans to pay a 50% excise tax (on top of regular corporate rates) on any reversion resulting from the termination of an overfunded pension plan. While this excise tax could be reduced to 20% under certain circumstances where the employer allocated some of the excess assets to employees in a successor plan, the net impact on the pension system was an artificial disincentive to overfund pension plans. This is one of many areas in which pension regulation penalized employers from doing the right thing --but not enough to significantly change the willingness of companies to sponsor plans.

During the 1990s, many aspects of the employment relationship changed. The previous focus and assumption that an employee would work for the same company throughout his/her careerwas replaced with a more transactional model, both because this fit employer needs and because of the social attitudes of younger employees. Under this new employment regime, many employers found that traditional defined benefit designs did not fit a changing workforce or did not have the retention value that they once had, or (and maybe most importantly) were not viewed by employees as having as much value as other plans. At the same time, the rise of 401(k) plans caused employees to be more "account focused," reducing the perceived value of defined benefit plans even further. Fortunately, the advent of cash balance plans provided these employers with a way to use the strong features of a defined benefit—the ability to take on long term risk, manage money professionally and cheaply, and protect employees—with the appeal of the account structured under a defined contribution plan.

And, particularly during the 1990s, there was substantial growth of employment in industries that focused less on "long term security" types of benefits. In particular, employment in both the service sector and the technology sector grew rapidly, and neither industry focused particular emphasis on defined benefit plans. This resulted in a decreasing number of employees (and percentage of the workforce) who were covered by defined benefit plans. The combination of fewer new companies starting plans and shifting demographics resulted in a maturing of pension demographics. This can be seen in the following data from the 2003 PBGC Insurance Data Book:

Trends in Pension Coverage (based on Single Employer Pension Sponsorship)

Year	Number of Plans with 1,000 or more Participants	Percent of Private Sector Workforce Covered	Total Number of Participants in Plans with 1,000 or more Participants	Percent of Total Participants Who are Active**
1980	3572	27.3%	20,653,000	77.6%
1985	3914	24.4%	22,467,000	72.2%
1990	4335	22.7%	24,676,000	68.1%
1995	4395	18.5%	27,613,000	57.8%
2000	4027	16.5%*	30,300,000	52.5%
2002	3855	N/A	31,102,000	N/A

*1999 Data

**Based on all plan sizes.

The statistics above can be interpreted in several different ways. Those larger companies that have traditionally sponsored defined benefit plans have been willing to stick with them, recognizing the value of the programs and the funding mechanism. This is in contrast to the small employer market, where sponsorship dropped from roughly 35,000 companies in 1980 to only 14,000 in 2002. However, the larger companies that have sponsored the plans employ a smaller part of the civilian workforce and are far more mature in their demographics. The maturity of these workforces, and the pension plans covering them, should be of concern to policymakers because the non-working workforce can represent a legacy cost and/or earnings drag to the sponsoring companies. In a competitive world, policy that makes these plans even more cumbersome or complicated is misguided.

On balance, while the defined benefit system sustained many "hits" during the almost 30-year period following ERISA, these happened during a time when markets were strong, interest rates higher, and CEO support of the defined benefit construct relatively strong. It is no wonder, then, that the decline in numbers of plans was relatively small.

What's Different This Time?
At this point, the pension world faces hard decisions in a tough environment.

- Many see the move in the accounting community to more "market-based" measures as the biggest threat to pensions. However, it can be argued that the accounting profession is only asking for changes because of the changes made to funding rules over the past 15 years. If pension funding rules cause high levels of volatility of contributions for sponsoring companies, then it is hard to argue why the accounting profession should not recognize that volatility. Unfortunately, if public policy requires pensions to be fully funded at every point in time, the rational accounting response could be to also move to a market measure. This pressure also exists from recent non-US standards that apply more of a "market-based" approach as well.

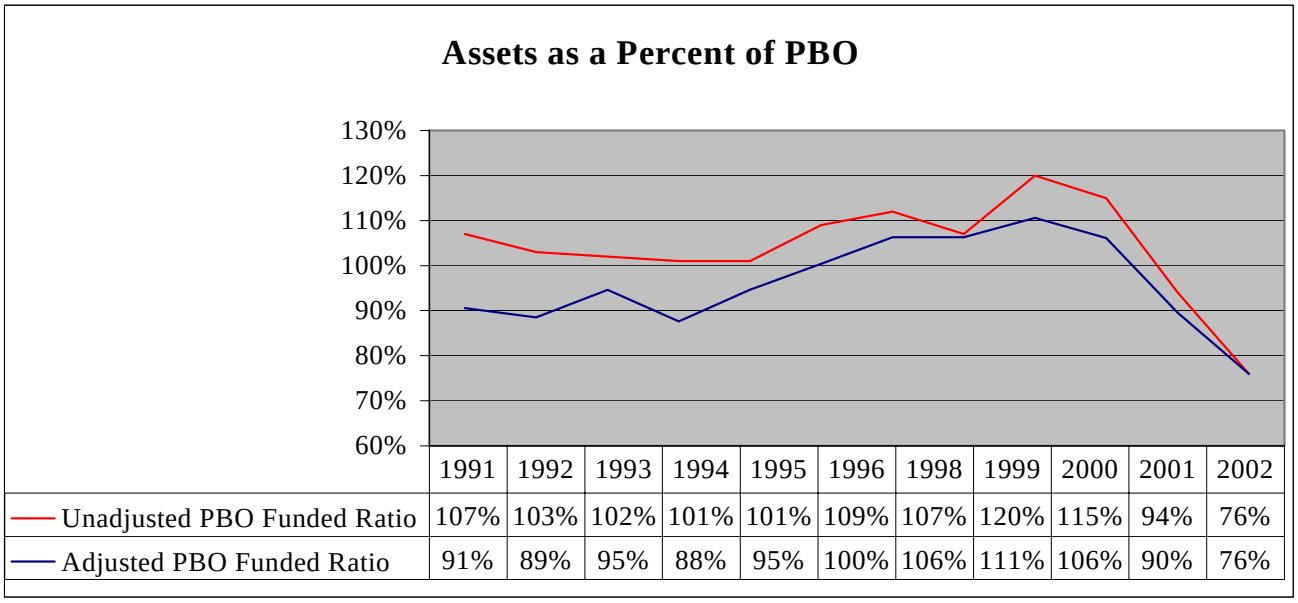
- While current public sentiment suggests pension plans should always be fully funded, there is no conceptual reason why this should be necessary if – and this is an important caveat – the sponsoring company is an ongoing entity. However, at a time when we have seen the downgrading of many "marquee name" companies, this may be a hard conversation to have.

- The call on companies for very large contributions comes at a time when the economy has been in a recession. In many cases, companies have to allocate limited resources between growing the business and funding the pension plan.

- Anecdotally, there are numerous stories of companies that negotiate pension increases instead of wage increases with no clear ability to eventually fund their commitment. Similarly, there are various companies where there was a "run on the bank" by participants just prior to a plan termination. In these cases, active employees took highly subsidized lump sums that left the plan in worse shape for the subsequent termination. To the extent these stories represent widespread practice, demands for tighter funding requirements are more likely to gain traction.

Many feel that current conditions are likely to cause many employers to exit the defined benefit system. In a recent CIEBA survey, nearly half suggested that if some key legislative and regulatory proposals are approved they would seriously consider freezing their pension plan. Since these plans have survived lots of changes in the past, it is worth asking what's different now. There are a few reasons why employers are more likely to abandon ship in the current environment:

- ***Funded status*—**While much has been made of the "perfect storm," the confluence of the lowest interest rates in five decades and a three year stock market downturn has resulted in a significant unfunded "burden" in defined benefit plans. As the following chart shows, the ratio of assets to Projected Benefit Obligation (PBO) for the Fortune 500 is significantly lower today than at any point in the past. (The chart also removes the impact of today's low interest environment by restating all liabilities to the same interest rate that is in effect today. This "Adjusted PBO Funded Ratio" shows that, even absent any changes of interest rates, plans funding has never been below the high 80% range until this past year). The low funded status has the following impact on the comfort of an employer in continuing to sponsor defined benefit plans:



	1991	1992	1993	1994	1995	1996	1998	1999	2000	2001	2002
Unadjusted PBO Funded Ratio	107%	103%	102%	101%	101%	109%	107%	120%	115%	94%	76%
Adjusted PBO Funded Ratio	91%	89%	95%	88%	95%	100%	106%	111%	106%	90%	76%

1. The tighter funding rules that the employer community accepted in the late 1980s and 1990s have now caused a large cash call on many companies, just at a time when employer cash is in short supply. The problem has been particularly acute in the airline industry. Perhaps the most visible discussion has been around the United Airlines bankruptcy, where United has publicly said it can either fund the business or fund the pension plan, but not both. The PBGC annually tracks the underfunding of companies with less than investment-grade bond ratings, where the implications of a cash call are particularly acute. The following table shows data from the PBGC's 2002 Pension Insurance Data Book.

Year	Underfunding in Companies with Less than Investment-Grade Bond Ratings (in billions)
1990	$8.00
1995	$14.56
2000	$3.79
2002	$34.10

2. Since cash contributions are currently dependent on a 30-year Treasury rate, the inability of Congress to permanently provide a better measure has led to significant uncertainty about future cash flows.

3. The accounting profession, stung by charges that pension accounting overly inflated earnings during "good times" and concerned about the impact of these plans on the corporate sponsor, has piled on, suggesting changes that could introduce substantially more volatility into corporate financials.

4. The stock market has become more likely to react negatively to companies that miss their earnings targets. The suggested accounting changes therefore raise the concern of the impact of pension cost timing on stock valuations.

5. The large number of employers that have booked a significant charge to equity due to their underfunded Accumulated Benefit Obligation, which adversely impacts their debt-to-equity ratio and possibly ratings with rating agencies. The following data is taken from Hewitt's annual survey of the pension disclosures of the Fortune 500 (about 370 companies have pension plans and show information in their financial statements)

Year	Number of Companies Reporting a Balance Sheet Adjustment Due to Pensions
1998	107
1999	124
2000	128
2001	175
2002	194

- ***A hostile environment***—In the last decade, employers have steadily redesigned their pension plans to make them more appropriate to the HR needs of today and to limit employer risk and exposure. While most large company pension plans were of a final average pay design in the early 1990s, today about one-third have moved to some form of hybrid design, most notably cash balance. Most employers provided significant transition protection even though there was no legal requirement to do so. However, the public confused and ignored the differences between the drop in the future promise and the transition benefits offered to many employees. Instead, they began shooting the cash balance messenger rather than understanding the business and HR rationale that accompanied these changes. At the same time, as companies were being held under a microscope, analysts and Congress also began applying more pressure. The confluence of these different interests has

lowered the resolve of many managements, resulting in less support. Finally, the most recent recession has been typified by stronger and faster corporate adjustments. When confronted with criticism or excess cost, companies have reacted far more decisively than ever before. Since defined benefit plans are, by nature, a long-term commitment, they are likely victims of a new management process that focuses on making short-term adjustments.

- ***Transparency***—The legacy of Enron and Sarbanes-Oxley is a demand that every nuance of corporate management be laid open to public inspection. Defined benefit plans are an easy target. With their muddled nomenclature and complicated actuarial underpinnings, they became the poster child for a perceived hidden (or, in more emotionally charged terms such as "off balance sheet") liability. The demand for greater disclosure resulted in suggestions that smoothing is bad, that corporate income was greatly misstated because of these plans, that underfunding could not be expressed on a longer term basis, and so on.

Prescriptions for the Future

Given where we are, there are a number of actions we suggest for a more rational and effective pension system:

- ***Replace the 30-year treasury rate permanently with a high-quality corporate bond-rate index.*** Congress is beginning to act on this one, but a permanent solution is needed for both the funding rules and the lump sum rules. Using 30-year treasury rates for plan funding requires companies to pay more than needed to fund their plans on either a long- or short-term horizon. Changing from a single rate to a yield curve will do little but complicate an already complex set of minimum funding requirements and introduce more contribution volatility. The continued use of the 30-year treasury rate for lump sum benefits leads to an enormous subsidy for this optional form that almost forces employees to elect this option as it is economically more valuable. This inflated lump sum costs employers money and diverts the value from the real purpose of defined benefit plans offering secure annuities. This rate should be based on a weighted-average over a period of four years rather than a shorter period of 90 days. A permanent solution should be put in place soon, not over a long five-year transition. The 30-year treasury rate also is used to calculate lump sum benefits. Maintaining this linkage has caused plans to pay lump sums that are larger than they actually should be, and have encouraged participants to ignore annuity types of distributions.

- ***Create certainty around defined benefit programs.*** There is too much ambiguity right now: plan sponsors cannot budget for 2004 cash requirements since the funding rules are not known; over the course of less than one year, the IRS and the Courts have differed on the legality of cash balance and other hybrid plans; US and non-US accounting standards continue to diverge with no clear path being set. Management is unable to plan for changes that are not known and will soon run out of patience for clear direction.

- ***Continue use of smoothing for funding and expense.*** As discussed throughout, regardless of financial models, pension plans represent a long-term instrument that can take on the risks of equity investment because of the time horizon of the plan. In an age of "transparency," investors and employees need to see the short-term picture of assets versus liabilities, but funding and accounting policy should be based on the long term, and smoothing should be accepted. Few corporate liabilities have the life span of pension liabilities, so to expect them to be managed under the same short-term horizon as other corporate liabilities is unreasonable. This suggests that disclosure on a marked-to-market basis is needed, but that the actual calculation of expense is best kept on a smoothed basis.

- ***Enact more rational funding rules for both minimum required and maximum deductible contributions.*** The volatility created by the proposed move toward immediate and short-term minimum funding requirements causes great concern. Current funding rules were never intended to anticipate a "perfect storm" type of situation, nor geared towards forcing plan sponsors to fund for a worse case scenario. These could be modified by placing a "cap" on the amount of contributions that need to be made in any one year, particularly in situations where the contribution levels have increased dramatically from previous years. At the same time, maximum tax deduction rules should be changed to allow companies to develop better funding cushions during good economic times. Many companies would have made contributions to their plans during the 1990s but for the limitations on tax deductions. Loosening these requirements by allowing deductible contributions up to a higher level of funding, say 120%, would give employers the opportunity to fund when cash is available in anticipation of times in the business cycle when it might not be as accessible.

- ***Create new forms of benefit obligations.*** Currently, employers have two choices. They can either provide defined contribution plans, where all risk is shifted to employees, or defined benefit plans, where no risk is shifted. As conditions cause more and more companies to find the defined benefit system overly problematic, companies will shift out of defined benefits, leaving employees to absorb large amounts of risk. There is no conceptual reason there couldn't be alternative approaches to retirement that might allow for a better sharing of risk between employees and employers. One idea offered by the American Academy of Actuaries is a DB-K Plus Plan, which would allow defined benefit plans to offer many of the advantages of defined contribution plans through a defined benefit plan. This would include pre-tax employee contributions, opportunity for employer matching, sharing in investment returns, and more flexibility around phased retirement payouts.

- ***Reform benefits payable upon a plan termination.*** If companies are, indeed, negotiating pension increases or otherwise making business decisions that represent uninsurable risk to the PBGC, then the termination rules should be changed to protect the PBGC against that risk, with appropriate disclosure of the issue to plan participants. Several proposals have also been made that would restrict the ability of sponsors to improve benefits if the plan was not funded to a targeted level. Ultimately, one new form of risk sharing could be achieved simply by lowering the amount of PBGC protection. This can be done by eliminating the protection of plant shutdown benefits or insuring less than 100% of the accrued benefit (e.g., 100% up to one-half of the current PBGC guarantee and 75% for the next half up to the PBGC guarantee). While such a suggestion is likely to be greeted with shock by many, most employees should appreciate a reduced guarantee to allow for the survival of the system. Finally, plan termination rules should be amended to reduce the excise tax to 20% (or 0%) for all situations on surplus assets that exist at plan termination. This excise tax has had two consequences. First, it causes many employers to resist developing a funding cushion. Second, it causes the financial community to discount (entirely) excess pension assets while emphasizing underfunding. If pension assets were entirely fungible, accounting principles would recognize excess as well as deficit.

Closing

The defined benefit system survived attacks before. Over the last 30 years, changes have reduced the number of defined benefit plans, but the majority of large employers have stayed in the system recognizing that a program offering defined benefit and defined contribution features is more effective retirement than a program supported only through a defined contribution plan. Unfortunately, this time it is different. The combination of missiles from multiple fronts during an economic environment of historically low interest rates and volatile stock market returns, may leave employers with no choice but to revisit their ability to sponsor these plans.

At the heart of the matter is a balance of short and long-term goals. If pension funding and financing must be viewed on a long-term basis with severe limitations and penalties for overfunding, but simultaneously on a short-term basis utilizing market related measures, employers cannot manage the challenges. For this reason, we think it is critical that pensions are considered for the long-term obligations they are. There are numerous mechanisms in place today through ERISA Liquidity Requirements and FAS 87 Additional Minimum Liability that place safeguards around short-term market fluctuations that could damage a plan. But when these are taken to an extreme, the employers that are really in it for the long haul will lose. There is a difference between transparency—which can be accomplished via various disclosures, many of which are already in place—and coherent funding and expensing policies that recognize the long term nature of pension obligations.

And while the PBGC's charter is to "encourage the continuation and maintenance of voluntary private pension plans," many of these changes proposed by the PBGC and others may do the exact opposite. And worse yet, if the healthy companies leave the system, the PBGC and Federal Government lose the backing of these organizations as part of the insurance against the troubled plans. This is a voluntary system and if the costs and risks become too high, employers will voluntarily leave.

Sources of Information

1. *2003–2004 U.S. Salaried SpecBook* (Hewitt Associates 2003)
2. *Trends and Experience in 401(k) Plans* (Hewitt Associates 2003)
3. *How Well are Employees Saving and Investing in 401(k) Plans (Hewitt Associates 2002)*
4. *Pension Plan Disclosure Under FASB No. 87 from the 1991 Financial Statements of Fortune 500 Industrials* (Hewitt Associates 1992)
5. *An Evolving Pension System: Trends in Defined Benefit and Defined Contribution Plans* (Employee Benefits Research Institute September 2002)
6. American Academy of Actuaries Issue Brief—*DB-K Plus: A Defined Benefit Plan with 401(k) Features*

Pension Fund Missiles Project:
Source of Yield Data

Bridgewater Associates
3/9/2004

Data:

Available data on yields at different points along the AA corporate bond yield curve is limited, and thus the first step in investigating the impact of switching from a smoothed discount rate to using the current AA yield curve was to construct historical yield series. A long-term history of AA yields for intermediate and long-term bonds exists from Lehman Brothers, and these data combined with the corresponding treasury rates were used to estimate the credit spread on intermediate and long-term corporate bonds back to 1973. The estimated spreads were compared to option-adjusted spreads since 1988 that have been separately published by Lehman Brothers and found to be reasonably close. The credit spread was then added to various points on the treasury curve to estimate the AA yields along the full curve. Since Treasury yields are so much more volatile than AA credit spreads, these estimates are believed to provide a series that reasonably approximates the volatility of the AA corporate bond yield curve back through history to 1970.

Observations:

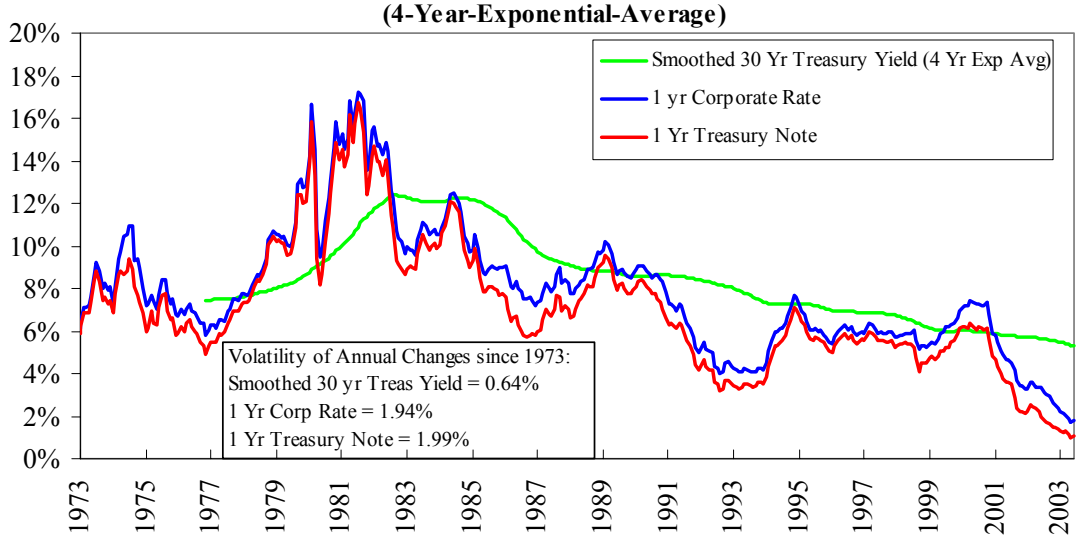
The switch from using the smoothed treasury bond yield to discount future pension fund liabilities to using the current AA corporate bond yield curve is likely to result in a significant increase in the volatility of the measurement of pension fund liabilities. As shown in the table below, the volatility of 12-month changes in AA corporate bond rates ranges from 2.2-3.3 times the volatility of annual changes in the four-year smoothed 30-year treasury rate since 1973, and the volatility difference has been even greater in the last ten years, ranging from 5.7-9.9 times as volatile.

Ratio of Std Dev of AA Corporate Rates to Std Dev of Smoothed 30-Year Treasury*		
Corporate Instrument	Since 1973	Since 1993
1 Year	3.26x	9.93x
2 Year	3.03x	9.91x
3 Year	2.88x	9.56x
5 Year	2.68x	8.70x
7 Year	2.52x	8.04x
10 Year	2.47x	7.28x
20 Year	2.30x	5.98x
30 Year	2.20x	5.67x

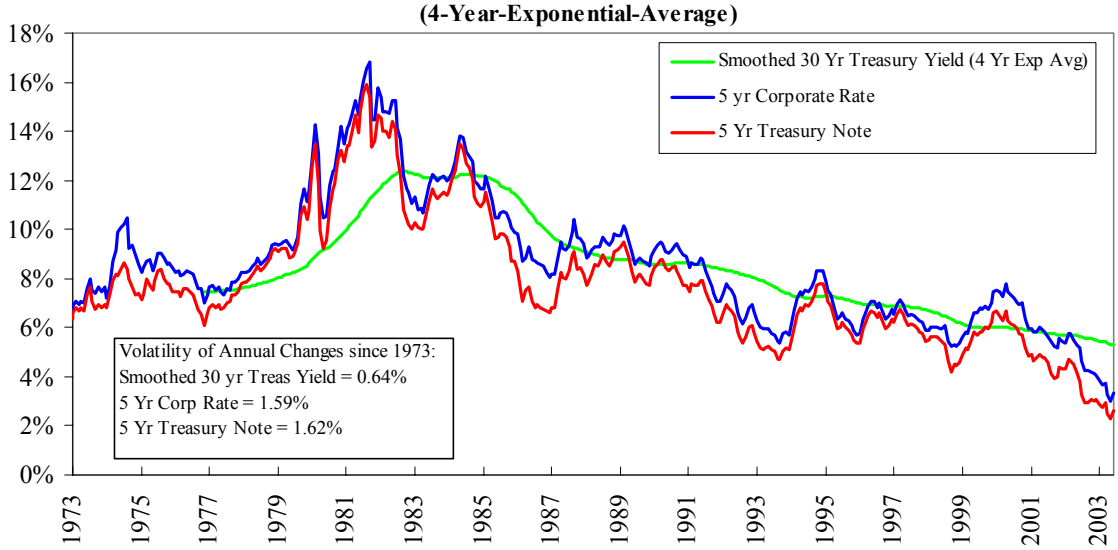
* standard deviations calcuated on the 12-month change in rates.

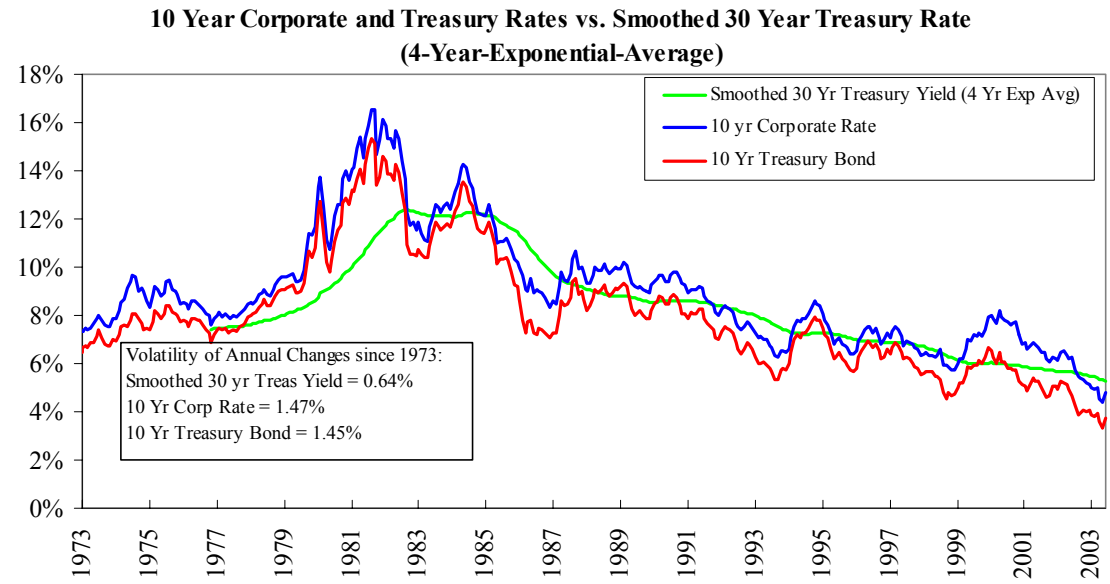
The following charts compare the smoothed treasury yield vs. the unsmoothed corporate bond yield at different points along the yield curve.

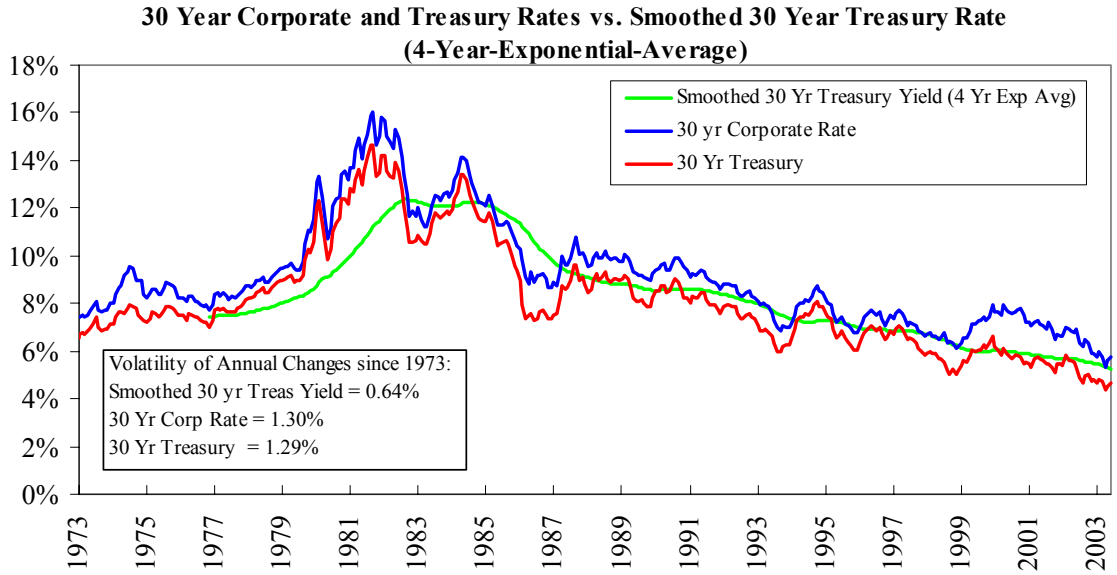
1 Year Corporate and Treasury Rates vs. Smoothed 30 Year Treasury Rate
(4-Year-Exponential-Average)



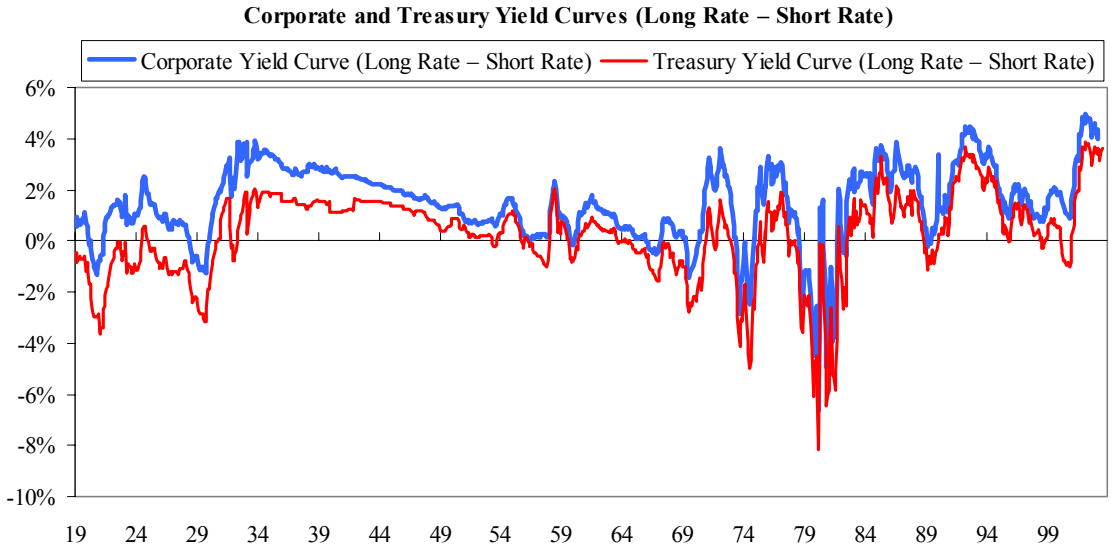
5 Year Corporate and Treasury Rates vs. Smoothed 30 Year Treasury Rate
(4-Year-Exponential-Average)







In addition to increasing the volatility of liability measurement, the valuation impact of shifting from the smoothed 30-year bond yield to using the corporate yield curve may be large if liabilities are of a very short duration since the yield curve is currently as steep as it has ever been in the last 80+ years, as shown in the next chart. As discussed later, however, the valuation impact is less clear since the switch from treasury rates to corporate yields results in lower valuations for very long-term liabilities and thus the valuation impact varies depending upon the profile of liabilities.



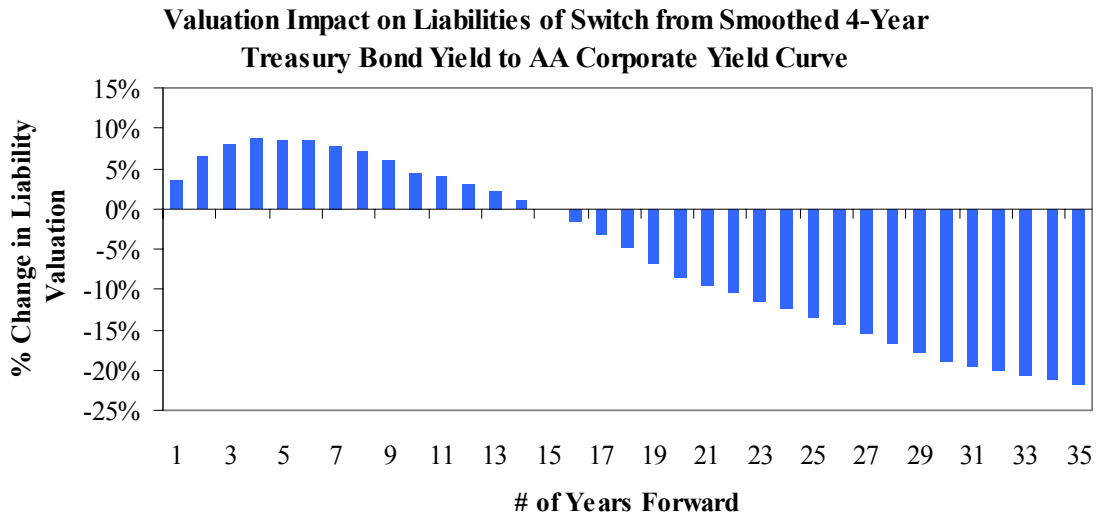
Lastly, using implied forward interest rates as a way to estimate the future level of interest rates along the curve was found to have limited value, and the predictive value drops the further into the future the estimate extends. Implied forward interest rates provided correlations as high as 0.6 in estimating rates two years in the future. Extending the estimate to three years out, the correlations dropped to 0.4-0.5, while estimates of rates five years in the future yielded a correlation of only 0.2.

Conclusions:

A change from discounting pension fund liabilities with the smoothed 4-year treasury yield to using the current AA corporate bond yield curve is likely to result in substantially greater volatility of pension liabilities, but the current impact on liability valuations varies based on the structure of the liabilities. The value of short-dated liabilities will increase whereas the value of long-dated liabilities will fall.

Based on historical data, the annual volatility of pension fund liabilities discounted using the AA corporate bond yield curve was found to increase by as little as two times and as much as six times that of using the smoothed Treasury bond yield. Data from the last ten years has been at the high end of the range (indicating an approximately six fold increase in volatility). While the volatility of liabilities will clearly be much higher going forward, the valuation impact of switching to the AA corporate yield curve is less clear. Although current treasury bonds yields are well below the smoothed 4-year rate, the switch from treasury bonds to corporate bonds helps to offset the impact of both lower bond yields and the very steep current yield curve.

Rough estimates of the valuation impact of switching to the current corporate yield curve indicate a less than 1% change in liabilities vs. discounting with the current smoothed 30-year treasury rate for a 12-year duration liability stream*. In practice, the valuation impact is likely to vary more based on differences in the profile of liabilities vs. the simple approximations that were used in these estimates, with short-dated liabilities increasing as much as +10% and the value of very long-dated liabilities falling substantially, as much as -20% for liabilities 30+ years into the future. The following chart shows a rough estimate of the impact of the switch from the smoothed 4-year treasury to the AA corporate yield curve on liabilities at various points in the future, from 1 to 35 years out.



The valuation impact is also very dependent upon the point in time of measurement, however, as it is at least as likely going forward that the corporate yield curve, with its embedded credit spreads, would be higher than the current discount rate and result in lower discounted values for liabilities as for corporate yields to be below the current discount rate and result in higher discounted values. In other words, the impact on valuations is not one-sided like volatility, and it is just as likely that valuations would fall as rise in switching to the corporate yield curve.

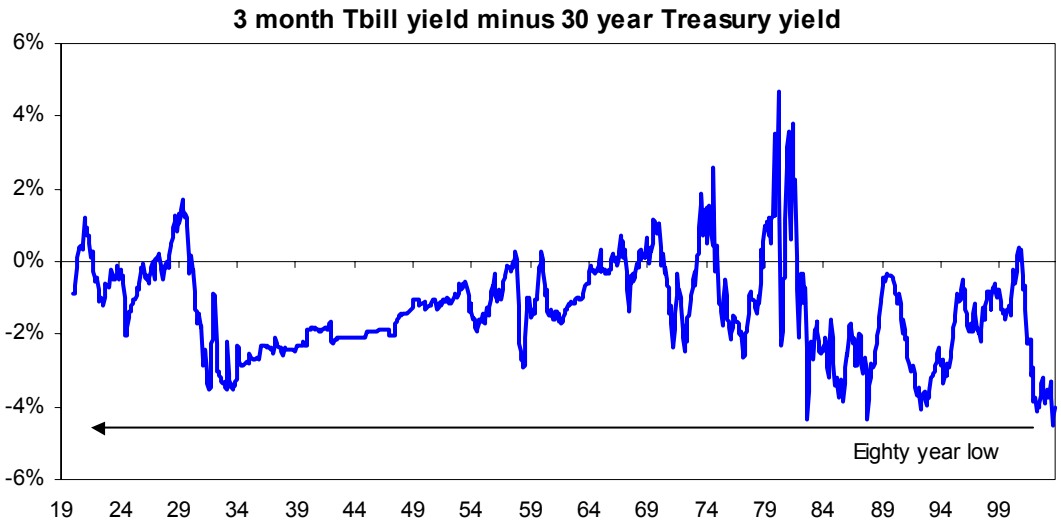
* Two simple examples were examined, both of which were constructed to provide a liability stream with an approximately 12-year duration using the current 4-year smoothed treasury yield of 5.27%. In the first, the liability stream was modeled by a 34-year annuity. In the second, liabilities were modeled with a 20-year bond. In switching from the smoothed treasury rate to the AA corporate yield curve, liabilities increased by less than 1% for both cases.

Interest Rate Dynamics in the Context of Pension Fund Liability Valuation

Bridgewater Associates
3/9/2004

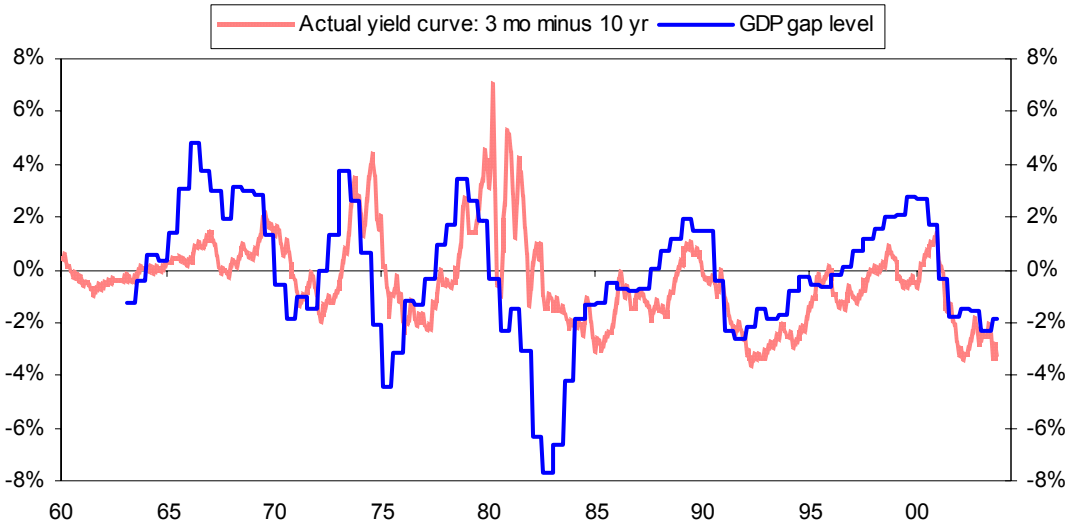
Since the level of interest rates is a driving influence on the net present value of pension fund liabilities and funded status, it is important to understand some of the dynamics of interest rates.

The current interest rate structure is very unusual in relation to history and in relation to what one would expect in a normal economic environment. For example, as shown below, the level of short-term interest rates in relation to the level of long-term interest rates is now at an 80 year low.



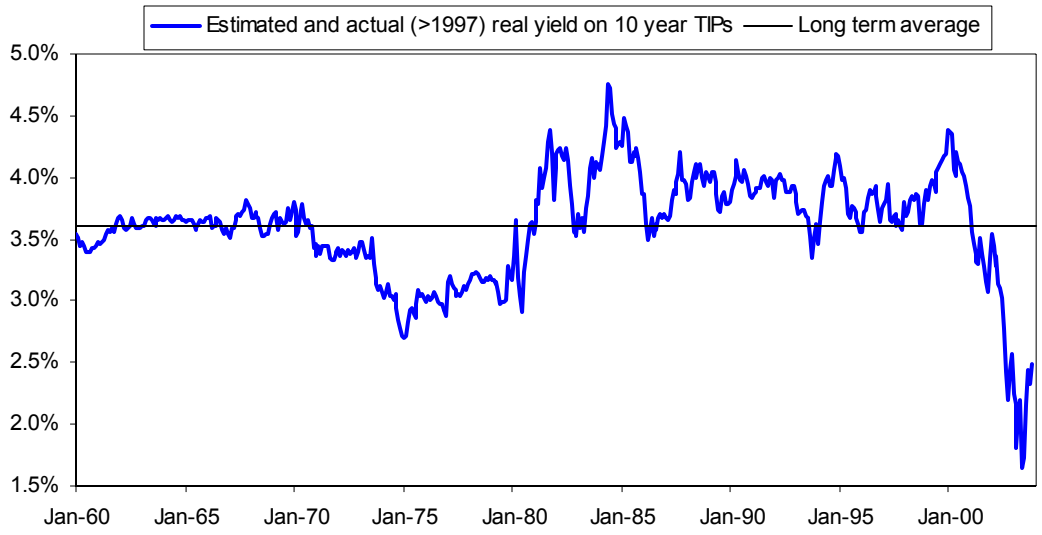
This interest rate structure directly reflects the exceptionally accommodative monetary policy currently pursued by the Federal Reserve Bank. The shortest-term interest rates are completely under the control of the Fed, while the longest-term interest rates are almost entirely driven by market forces. Interest rates in-between these two extremes reflect a combination of Fed policy and market forces. This is because the overnight rate is always the alternative investment to any particular bond, and the shorter term the bond, the closer the alternative. For example, the overnight rate is now 1.0% and the 30-year treasury yield is 5.2%. The ten-year yield reflects a combination of these forces and is now at 4.4%. The 0.8% yield spread between 10-year treasuries and 30-year treasuries is wide in relation to history. In other words, 10-year treasury yields are lower than normal in relation to 30-year yields. One reason that this yield spread is so wide is because the shorter term the bond, the more its yield competes against the overnight rate. Therefore, 10-year yields are substantially lower than 30 year yields because they compete more directly against today's very low overnight rate.

This fact has practical implications for the pension liability discount rate. Short-term interest rates are lowest in recessions because in recessions the Fed runs an easier monetary policy. Similarly, yield curves are steepest in recessions. For example, the following chart shows the slope of the yield curve vs. the output gap in the U.S. economy. Because yield curves are steepest in recessions, a shorter-term discount rate will create higher liability valuations in recessions. And as shown above, today's yield curve is the steepest in 80 years. In other words, the shorter-term discount rate will create the highest pension funding requirements in recessions, which is generally a time when companies are more strapped for cash and credit availability is lowest.

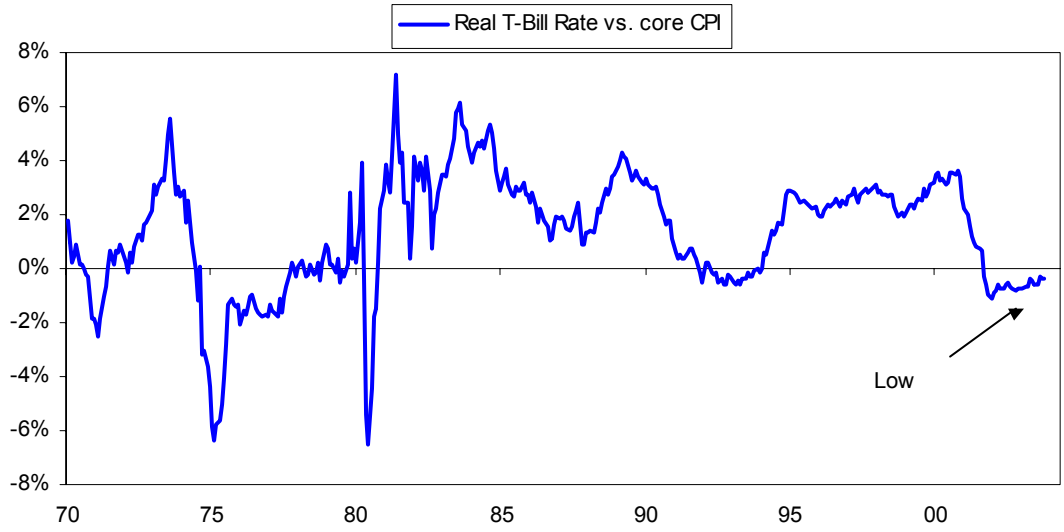


Another unique dynamic of today's interest rate environment is the extremely low level of real bond yields. Real bond yields are particularly influential on liability valuations. If nominal interest rates rise or fall because of a change in inflation expectations, the future value of pension liabilities should rise or fall in sync with the change in inflation expectations. The simultaneous change in the inflation rate used to estimate future pension payments and the inflation rate embedded in bond yields means that the two influences will be substantially offsetting. This is because a fall in inflation expectations would imply both lower future pension outlays and a lower discount rate to calculate their present value. But when real interest rates change there is no offset between the future liability value and the discount rate. As a result, changes in real yields pass through fully to changes in liability valuation.

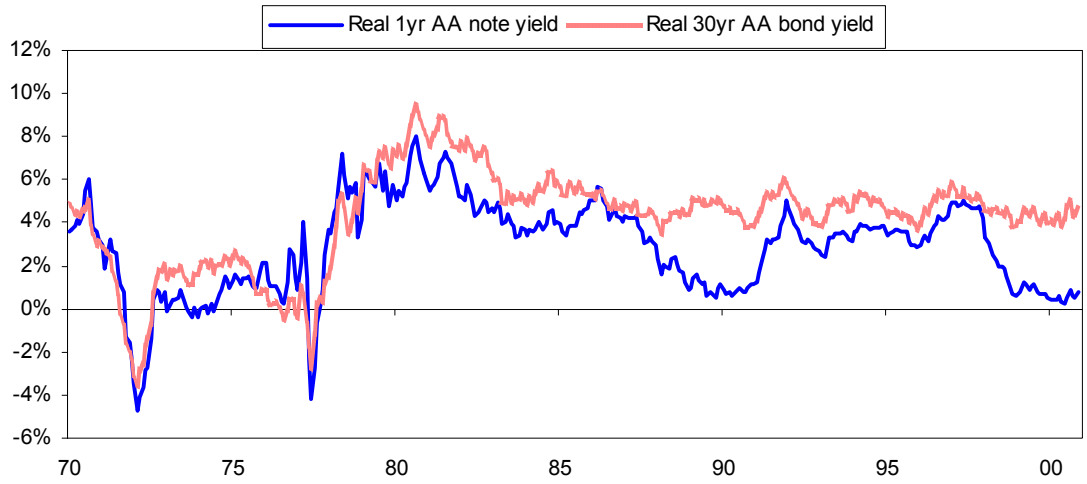
Today, the level of real bond yields is the lowest in decades. In fact, almost all of the recent decline in bond yields has been attributable to declining real yields, not declining inflation expectations. The following chart shows the history of real yields as priced into TIPs since 1997, attached to a simulation of prior real bond yields based on the analysis of Bridgewater Associates, Inc. an institutional inflation-indexed bond manager. As shown, today's 2.5% 10-year real bond yield is extremely low in relation to history.



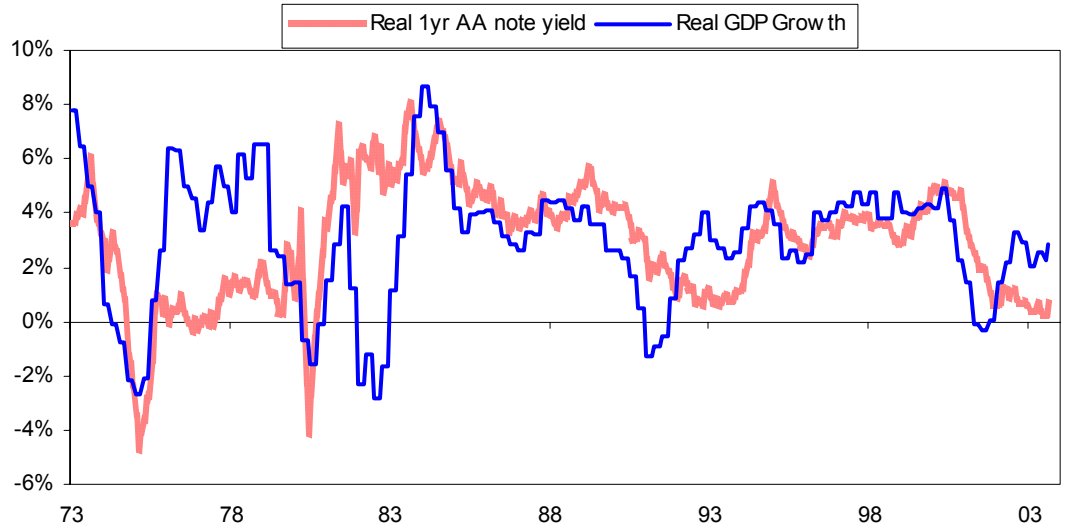
The low level of real bond yields is directly related to the current economic cycle. Real bond yields can be low because real short-term interest rates are even lower. For example, the real Tbill rate is now –0.4%. In other words, just as economic weakness and an easy Fed policy are creating a steep yield curve, the same conditions are holding real bond yields down at an extremely low level. The following chart shows the level of real Tbill rates.



Real short-term interest rates, and the conditions that cause them, substantially influence real long-term interest rates. The following chart shows how real long term interest rates move in sync with real short-term interest rates.

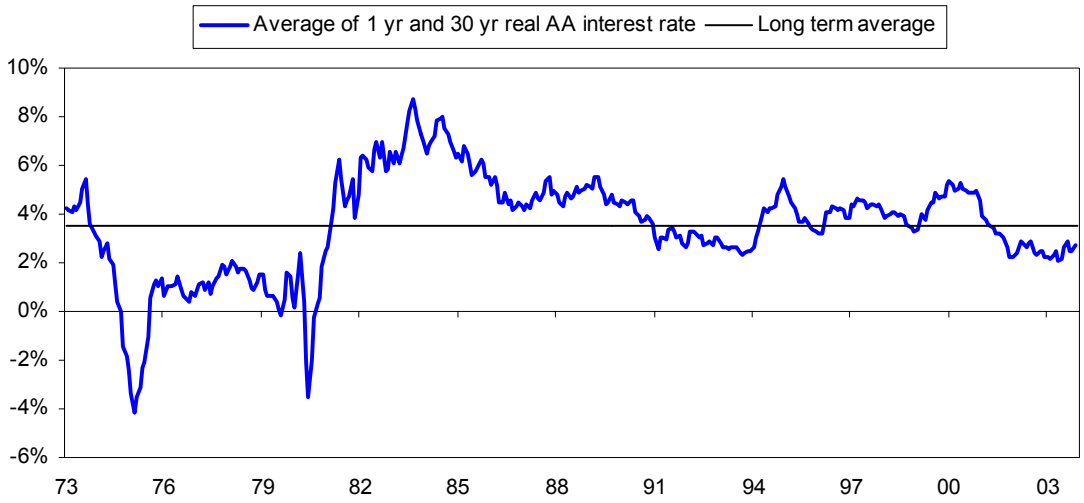


And real short-term interest rates are heavily influenced by the economic cycle. The following chart shows real short-term interest rates in relation to real GDP growth.

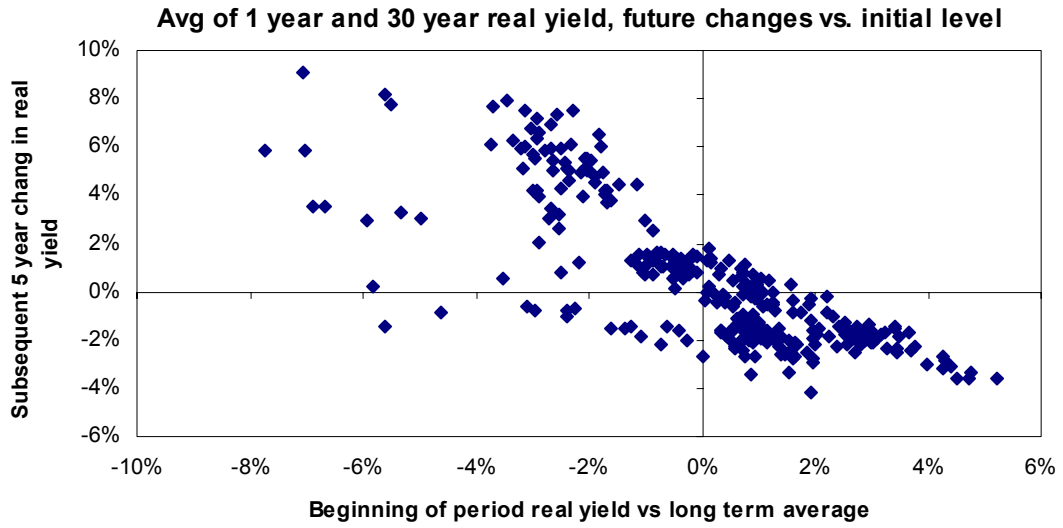


Because real interest rates are generally lowest during recessions, the real component of interest rates creates higher liability valuations and higher funding requirements during recessions, and lower valuations and lower funding requirements in economic expansions.

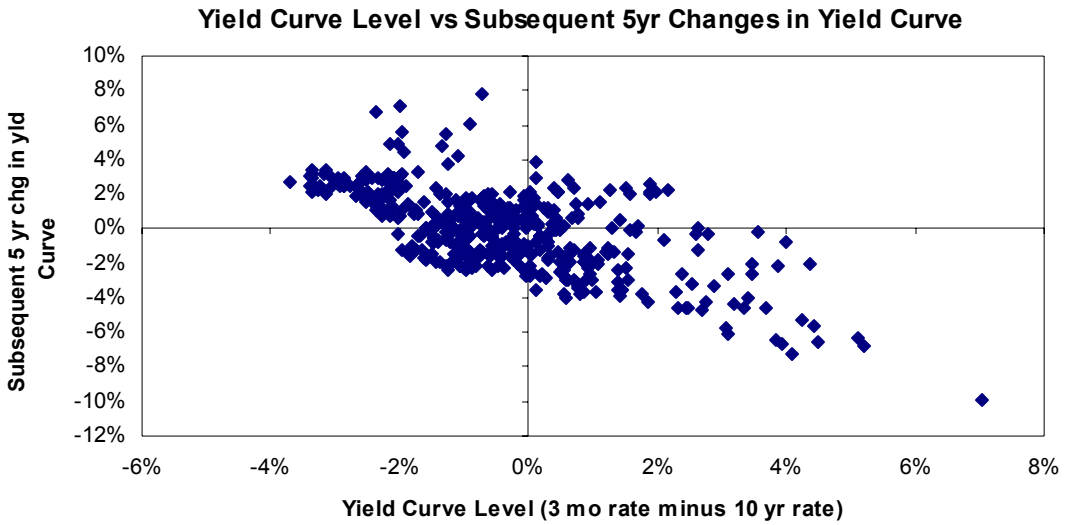
Because the slope of the yield curve and the level of real interest rates are directly related to the economic cycle, and because the U.S. economic cycle normalizes over time, the yield curve and real interest rates also normalize over time. The following chart shows how the average of one year and thirty-year interest rates oscillate around their long-term norm. The rationale for this is clear. The level of real interest rates should relate to real economic growth, because real economic growth is the source of cash flow to repay debt. Higher real interest rates would create unsustainable debt burdens and lower real interest rates would discourage lending.



If real interest rates should revert toward long-term economic growth, and if long-term economic growth remains normal, then real interest rates should revert toward a normal level over time. This has been true in the past. The following chart shows the five-year change in real interest rates in relation to their beginning level. When real interest rates are low they tend to rise in subsequent years, and vice versa.



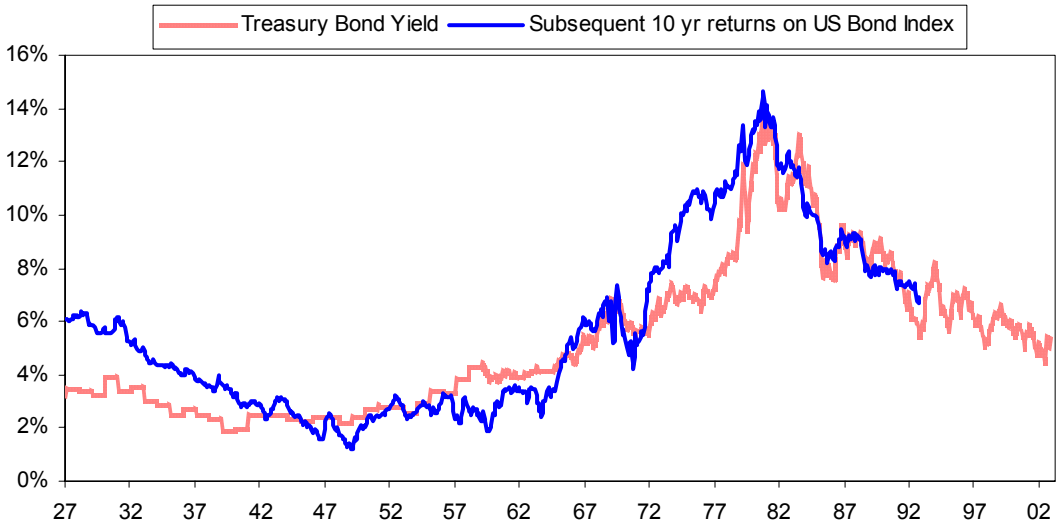
Likewise, the slope of the yield curve behaves similarly for similar reasons.



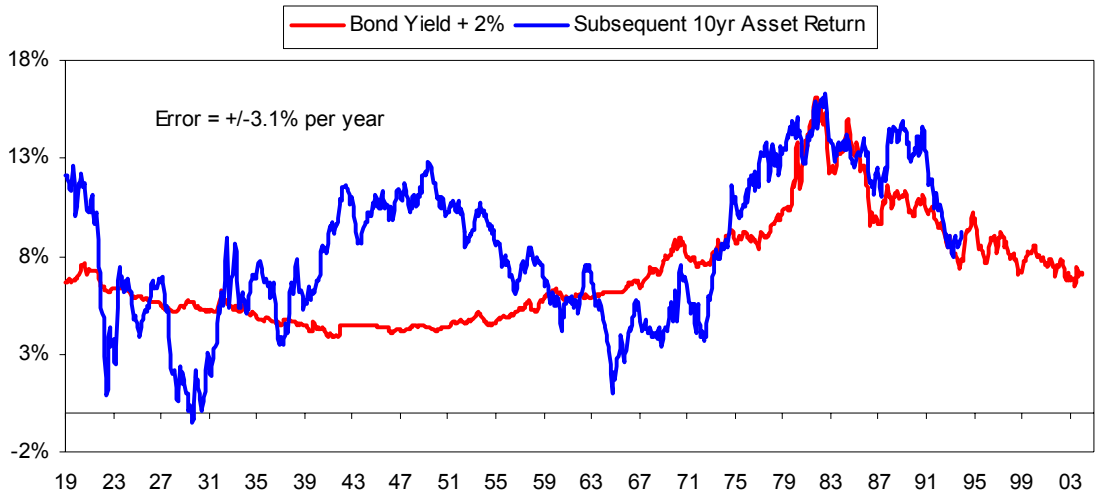
From a logical and observed standpoint we see that real interest rates and short interest rates create higher funding requirements in recessions and lower funding requirements in economic expansions. This pattern exacerbates the normal, cyclical cash flow pattern of corporates. The same pattern exists for public pension funds because tax revenues and government expenditures are highly cyclical.

Expected Returns:

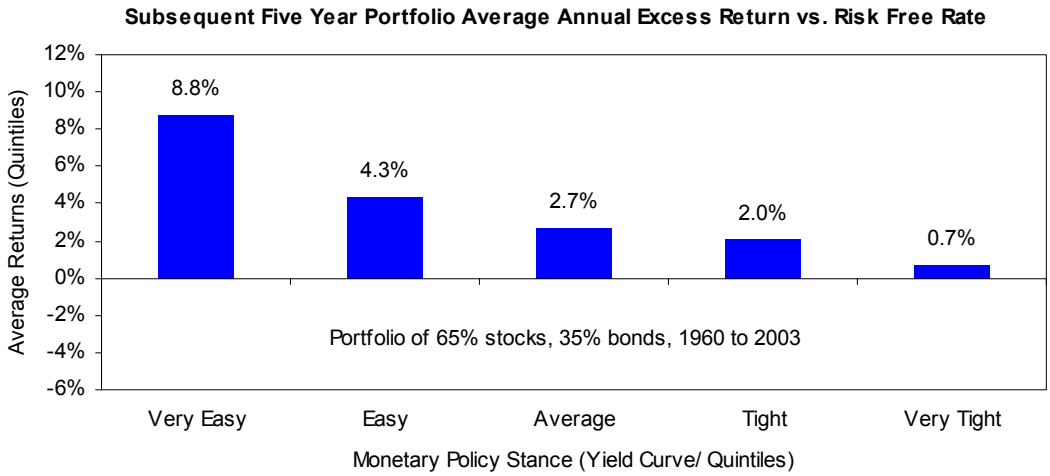
The long term expected return of bonds is largely driven by the level of yields. This is intuitively appealing since the yield literally reflects the contractual return due to the holder of the bond. The following chart shows the future ten-year return of bonds in relation to the ten-year treasury bond yield at the beginning of that period, since 1928.



Long-term bond yields are not necessarily good predictors of future returns on a diversified portfolio of stocks and bonds. The following chart shows the ten-year return of a portfolio that is invested 65% in U.S. stocks and 35% in U.S. bonds, compared to the bond yield at the beginning of the period. The accuracy of the bond yield with respect to the future actual return of a diversified asset portfolio has been with 3.1% per year 65% of the time, and within 6.2% per year 95% of the time. In other words, the bond yield is a very loose approximation of the future return of a diversified asset portfolio.



One reason that this is true is because low interest rates are *favorable* for equities, while they are unfavorable for bonds. While easy monetary policies drive interest rates down, easy monetary policies actually tend to produce *higher* future returns in a diversified portfolio of stocks and bonds. The following chart shows the five year return of a 65%/35% stock/bond portfolio relative to the easiness or tightness of monetary policy at the beginning of this five year period. As shown, the highest returns follow periods of easy monetary policy and the lowest returns follow periods of tight monetary policy.



Summary Observations:

Relating these dynamics to current conditions we see that:

a) Short-term interest rates are now very low in relation to long-term interest rates, i.e. the yield curve is very steep in relation to normal.
b) Real interest rates are very low at all points on the yield curve.
c) These two conditions relate directly to the recent weak economy and easy monetary policy.
d) The long term expected return of bonds is low.
e) The bond yield is a fair to poor measure of the actual future return of a diversified portfolio of assets that includes equities.
f) Funding requirements that would be based on current real yields and short-term interest rates would be high in relation to normal.
g) The current steep yield curve and the low level of real yields are unlikely to persist if the economy passes to the next stage of a normal economic cycle.