ERISA Industry Council Written Testimony
Private Sector Pension De-risking and Participant Protections
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EXECUTIVE SUMMARY

Developments in recent decades have made it challenging to manage pension risk at U.S. corporations. Equity returns hid cost and risk during the 1980's and 1990's, while plans grew bigger and more impactful. The 2000's brought big downturns in equity values and interest rates, as well as new rules which recognized the impact of these developments more immediately. Plan sponsors and their advisors found it hard to adapt to the new environment and reacted by closing and freezing many plans.

It is increasingly recognized that it may not make sense for corporations to take on significant pension risk in the form of large investments in equities, rather than liability-matching bonds. Financial stakeholders in a corporation can get exposure to equities more effectively by doing it directly. Pension liabilities that are not matched with bonds increase leverage (financial risk) for the sponsoring company. Therefore, corporations may prefer to take risk in their business, rather than their pension plan.

Plan sponsors have frozen and closed their plans, rather than looking for new ways to manage them. Pension plans which have been frozen or closed are likely to be terminated as soon as the plan can be fully funded. Currently, most plan terminations are being deferred while interest rates are low and substantial contributions would be needed for a termination.

In the meantime, sponsors are turning to interim measures, such as lump sum windows and group annuities for portions of their participant populations. These actions result in removing pension liability from the company and the risk related to securing future pension income is transferred to participants or to an insurance company. Ford, GM and Verizon made news with their transactions in 2012.

In 2012, plan sponsors took advantage of PPA's new lump sum interest rate rules and the fact that they could look back into 2011 for higher rates, knowing that rates had already dropped significantly in 2012. They offered lump sums, for a temporary "window" period in exchange for the annuity promises held by vested terminated participants, and in a few cases, by retirees as well.

Lump Sums are significantly less costly than securing the same benefits with a group annuity and also cost less than securing benefits directly with a low risk portfolio of assets. In addition, plan expenses are reduced. Lump sums do introduce anti-selection, which can increase the cost of a plan, especially for retirees. The anti-selection effect is likely to limit the number of lump sum offers made to retirees.

Group annuities are viewed as relatively expensive. This is because an insurance company will want to have ample assets to cover the risk taken on and still generate some profit for the insurer.

The table below shows approximate cost ranges for various pension de-risking options, expressed relative to the accounting or funding liability for the ongoing plan.

	Active	Vested terminated	Retired	Typical full plan
Ongoing liability (ABO or Funding target using yield curve)	100	100	100	100
Annuities paid from plan, with closely matched LDI portfolio	110 - 120	105 - 115	105 - 110	110
Group annuity	115 - 130	110 - 120	108 - 112	115
Lump sums[1]	95 - 100	95 - 100	100 - 110	n/a
Plan termination[2]	105 - 115	105 - 110	108 - 112	110

[1] includes impact of anti-selection and lookback period for interest rate selection
[2]combination of lump sums and group annuity purchase

Participants who are offered a lump sum have received a potentially valuable option, but making the choice is not easy. There is no right answer for everyone and there is usually no obvious answer for anyone. Some of the key factors that a knowledgeable person might consider are shown below.

Key Advantages of a Lump Sum from a Pension Plan

- Personal control over assets and investment decisions
- Flexibility to use the lump sum for a particular purpose
- More value received up-front in case of an early death

Key Advantages of an Annuity from a Pension Plan/Group Annuity Contract

- Don't have to manage assets and assume investment risk
- Guaranteed income for life
- Less expensive than purchasing an individual annuity

Other important Considerations

- Social Security and other guaranteed income compared to basic living expenses
- Impact of inflation on spending power of annuity or lump sum
- Potential for insurance company or pension plan to default on annuity payments
- Overall wealth and corresponding need for guaranteed income
- Size of benefits and lump sum
- Inclusion/Exclusion of early retirement subsidies in lump sum amount
- Level of interest rates used to calculate lump sum amount
- Use of unisex mortality factors as required by law

This testimony focuses on items A., B. and E. in the Council's description of Objective and Scope

BACKGROUND

Introduction

Thank you for the opportunity to present my thoughts on pension de-risking strategies being practiced by corporate defined benefit plan sponsors. I am personally a strong advocate for defined benefit plans and share with my employer, Vanguard, the idea that defined benefit plans can be an important part of corporate retirement programs if the risk is well understood and managed. The current trend toward de-risking by eliminating defined benefit programs or portions of them is easy to understand and sympathize with, given the chronology of events over the past few decades. However, a different approach to managing the financial risk in these plans might have reduced the extent of the current trend and helped preserve more defined benefit programs.

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Current Situation

Information as of the end of 2012 from the PBGC indicates that about 31% of plans (covering 14% of active participants) are fully frozen and an additional 5% of plans (covering another 14% of active participants) are closed to new entrants. Personal experience indicates that at least half of existing plans at medium and large employers are closed or frozen and other surveys support this notion. These are the plans that are likely to undertake significant risk transfer actions. Fully frozen plans are likely to terminate as soon as practical since the plan is no longer contributing to the sponsor's business, HR, and benefit objectives. Plans that are closed are likely to terminate as soon as practical after the closed group still earning benefits has retired or the plan sponsor decides to fully freeze the benefits. The risk transfer actions seen during the last year can be viewed as interim steps toward eventual full termination of these plans.

The trend of freezing, closing and risk transfer is primarily driven by new perspectives on pension risk by corporations sponsoring defined benefit pension plans. Factors driving this new perspective include turbulent financial markets, low interest rates, plan size relative to the size of the plan sponsor, and new rules for measuring funded status and determining lump sum amounts.

What is pension risk?

There are three key elements to pension risk:

- *Interest rate risk* –The value of any expected payment such as a pension, loan, or bond is determined with interest rates. Rates change based on many factors such as actions by the Federal Reserve and expectations for inflation. When interest rates change the value of a pension liability changes – lower rates increase the value of a pension obligation since less interest can be earned prior to making the payment.
- *Equity (or other non-matching asset) risk* – investment in equities or other assets that do not match[1] the liability expose the plan to the changes in value in those assets. Riskier assets are generally expected to have higher returns, but also have more and bigger unexpected changes in value.
- *Demographic risk* – the value of a pension obligation changes when the participants, as a group, live longer or shorter than expected; when they retire at ages that are different than expected; or when other developments such as disability, termination of employment, marriage, etc. happen at a rate other than expected. The expectations are developed by an actuary and used as actuarial assumptions in calculating the expected payments from the plan, which are then, valued using interest rates.

Interest rate risk and equity risk are much more significant for most plans than is demographic risk. Both interest rate risk and equity risk can be substantially eliminated by investing in the right, matching assets – usually long duration bonds.

Each of these items is a risk because it has the potential to change the value of the pension assets or the pension obligation unexpectedly. When that happens, the funded status of the plan changes unexpectedly and the future accounting cost and contribution requirements must adjust in recognition of the new funded status. It is these changes in cost that introduce risk for a corporation or insurance company that has responsibility for paying out future pension benefits.

Options for pension de-risking

There are many de-risking options available to defined benefit plan sponsors. The Council is focused on risk transfer options such as lump sum window programs and group annuity purchases, and implicitly plan terminations, which are mostly being deferred at this time. Because risk transfer is just part of a more comprehensive movement toward pension de-risking, other de-risking options are described below under Other Pension De-risking Options.

[1] Assets which "match" a pension liability are assets with a value that changes in the same way the value of the liability changes when interest rates change. These assets are usually bonds with payments that extend many years into the future, like the payments from the pension plan. These bonds and the pension liability are said to have long "durations". Duration is a measure of the sensitivity to interest rates of the value of an asset or liability.

CORPORATE FINANCIAL ANALYSIS OF PENSION RISK TRANSFER

Plan terminations

The most complete risk reduction mechanism is a full risk transfer, accomplished through a standard plan termination. A plan termination is accomplished by paying lump sum benefits to those who choose them (a lump sum option is usually introduced as part of the plan termination if it was not already available) and purchasing a group annuity contract from an insurance company to cover the benefit promises for other participants.

While many plan sponsors with frozen plans probably anticipated terminating their plans in 2012, when the PPA lump sum interest rates were fully phased in, most plans found themselves very underfunded and felt that it was too expensive to terminate their plan when interest rates were very low. This led to the numerous lump sum window programs and the large group annuity purchases in 2012 (lump sum window activity continues in 2013) which can be seen as interim steps toward an eventual full termination of the plan.

Plan terminations – plan size

Another reason to put off full plan termination for large plans is that it would be very difficult to fully terminate a large plan all at once. The key challenge is to purchase the large group annuity contract needed to effect the termination of a big plan. Insurance companies must plan carefully to fit large group annuity purchases into their overall business mix and work together with the purchasers to obtain the assets required to back the annuity obligations. Very few plans with more than a few hundred million dollars in assets have terminated in the past. However, the large annuity contracts purchased by General Motors and Verizon showed that it can be done with lots of careful planning and negotiation.

However neither of these transactions involved an annuity purchase covering active employees. The additional uncertainty in the ultimate cost of an annuity for an active employee (retirement date, benefit option, investment results over long time period until payment) makes it more expensive. General Motors (GM) and other employers with older workforces and pension plans that have existed for a long time may expect more of their active employees to keep their promised annuity, rather than choose a lump sum because of the size of the benefits that have been accrued. This would make the group annuity portion of the plan termination much more expensive for them than for other organizations.

Lump Sums

Plan sponsors view lump sum payments as a cost-effective way to eliminate pension liability and this is an accurate perception. A lump sum is significantly less expensive than purchasing an annuity (even as part of group annuity contract) for a participant – roughly 15% to 30% cheaper depending on circumstances. In theory a lump sum calculated according to PPA rules represents the market value of

the pension promise on an actuarial basis. However, when the risk in high quality corporate bonds[2] is factored in, along with longevity risk, and expenses, a lump sum payment can be viewed as representing about a 10% to 20% savings over keeping the obligation for a participant in the plan.

Prior to PPA lump sums were calculated using 30-year treasury rates which provided more generous, expensive lump sums, even though mortality assumptions used under old rules were less generous. Assuming that the same level of overall interest rates exists, the new lump sum rules provide payments that are about 10% - 50% (depending on age) less generous than under old rules. The new rules are arguably more consistent with basic financial principles, but should not necessarily be considered more or less equitable.

Plan sponsors waited for these new rules to be fully phased in, in 2012, before beginning significant risk transfer activity since most of that activity involved lump sum payments to some degree, with the significant exception being Verizon's group annuity purchase.

Plan sponsors who offered lump sums in 2012 generally used rates from the end of 2011, as is the typical practice based on PPA rules. Because interest rates had dropped during 2012, lump sum amounts paid in 2012 were even more cost effective, relative to the market interest rates that had developed by the middle of 2012. Some plan sponsors moved quickly to be able to complete their lump sum window during 2012.

Lump Sums to Retirees

In 2012, a long-held belief that lump sums could only be offered to retirees when a plan was terminated was reexamined. While the same rules apply for calculating lump sums paid to active, retired or vested terminated participants, certain IRC sections had been interpreted as prohibiting offering a lump choice to already retired participants except in the case of a plan termination. New, private rulings from the IRS explained a line of thinking which allowed plans to proceed with offering lump sums to retired participants that allowed Ford and GM to proceed with their programs.

Offering lump sums to the currently retired population has the potential to increase the cost of the plan. Those already retired, generally of ages 60 – 85, will on the whole have better knowledge about how long they might live than younger participants. Because those who do not expect to live a long life would naturally choose a lump sum payment over an annuity and those who do expect to live a long time will tend to choose an annuity, introducing a choice allows participants to select against the plan, choosing the best option for their circumstances and the most expensive option for the plan sponsor.

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[2] The corporate bond interest rates used to value pension liabilities and lump sums under PPA include a significant "spread" above the rate of interest paid on U.S. Treasury securities. This additional interest is paid because investors in those bonds perceive them to have various types of risk and they demand to be paid the higher rate of interest. A significant part of the spread is due to the potential for default on the bond payments, and the related issue of downgrades in credit quality. Downgrades, defaults and other risks inherent in using corporate bonds to cover an obligation to make pension payments result in the full cost of a pension liability being higher than that measured by PPA or accounting rules.

This "anti-selection" effect is likely the reason that GM only offered a lump sum choice to their younger retirees.

Group annuities

Securing an annuity promise with an insurer obviously involves transferring all risk related to making the future benefit payments to the insurer. Because an insurance company enters into business to make a profit and must guarantee payment, the basis on which they will take over the obligation to make promised payments many years in the future is relatively conservative. Very roughly, the cost of securing payments for already retired participants is about 108% - 112% of the liability calculated by most plan sponsors for accounting purposes while the plan is ongoing. As explained above, the group annuity cost for active participants is higher - typically in the range of 115% - 130% of the ongoing liability.

Because of the cost of group annuities relative to lump sums, plan sponsors will be able to settle their pension obligations at a lower cost if more participants elect to receive their benefits as lump sums.

Accounting treatment

When a company pays out a significant number or lump sums or buys a group annuity contract for a significant number of employees, they are said to have "settled" a portion of their pension obligation. Pension accounting rules under US GAAP require that a portion of any unamortized gains or losses[3] be recognized when a significant "settlement" occurs. Many plan sponsors view the immediate one-time recognition of a significant amount of unamortized pension cost as undesirable and this discourages them from risk transfer transactions. Other plan sponsors may prefer to get portions of their unamortized losses "out of the way" in chunks, which may be viewed as special one-time events, rather than have them drag down their operating earnings for many years into the future.

Other financial impact

Risk transfer transactions also reduce the number of participants covered by a pension plan. Therefore expenses such as PBGC premiums and administrative expenses are eliminated.

For plans that are not fully funded, the funded status of a plan, as a percentage (but not necessarily in dollar terms), will be reduced which means that at least some level of additional contribution will be required to meet minimum funding rules or avoid restrictions on lump sum payments.

[3] Most pension plan sponsors have accumulated significant unamortized losses in the equity portion of their balance sheet due to lower than expected returns on assets, but more significantly due to the steady drop in interest rates since the inception of FAS 87 rules in 1985. These losses are not recognized immediately in a company's profit and loss statement but are recognized (amortized) gradually and therefore accumulate until being recognized.

WHY PENSION RISK TRANSFER NOW

History (see Appendix A for more detail)

It makes sense to examine the roots of the current situation by looking back as far as the 1970's around the passage of ERISA. At the time, pension plan obligations were relatively small – there were few retirees, participants were young and the payments being promised were, for the most part, many years away. During the 1980's and 1990's plan's grew bigger as benefits accrued, employees retired, participants got older and interest rates dropped. By the 2000's pension plans were much bigger relative to the size of the company's sponsoring them. They had developed the potential to have significant impact on company financial situations. However, as this potential developed, the strong equity markets of the 80's and 90's covered the cost and masked the risk in the plans.

Plan sponsors relied on high investment returns and did not see a need to develop strong risk management for their pension plans. Corporations and their advisors were not prepared for the impact of the downturns in the equity markets and steady drop in interest rates that we have experienced in the 2000's. Rules were changed in response to the downturn in the early 2000's (FAS 158 for accounting and PPA for funding) so that changes in funded status were translated more immediately and directly into higher cost and contribution requirements. However plan sponsors and their advisors continued to manage their plans based on their earlier experiences while the plans "grew up" during the 70's, 80's and 90's. Without strong risk management, pension plans were devastated by the turbulent equity markets and low interest rate environment of recent years.

By 2009 many, if not most, plan sponsors were looking to "exit the DB business" – ideally by terminating their plans. However low rates made it look expensive and low levels of funding meant that large cash contributions would be needed at a time when companies wanted to have lots of liquid cash available. In addition, terminating a plan usually involves introducing a lump sum option for active and vested terminated participants, so plan sponsors were waiting for new PPA lump sum calculation rules to be fully phased in, in 2012. 2012 was destined to be a year of many plan terminations, except that interest rates and funded statuses dropped even further. That led to actions which accomplished at least some risk transfer, without a full plan termination.

Plan size relative to size of plan sponsor

The most important factor incenting plan sponsors to transfer risk is the size of the pension plan relative to the size of the plan sponsor. This can be measured as the ratio of the ABO or PBO[4] divided by indicators of the size of the corporation such as revenue, assets or market capitalization. Where the ratio of ABO to revenue or corporate assets is 10% or more, the plan may be considered of at least moderate size. Where these ratios are 50% or more, the pension plan has a significant impact on the corporate financial situation and pension risk is likely to be a significant concern for the plan sponsor.

[4] ABO (accumulated benefit obligation) and PBO (projected benefit obligation) are measures of the pension liability defined by US GAAP accounting standards. The ABO is an equivalent concept to the PPA funding target, but may be measured with a different interest rate.

These situations arise where plans have been in existence for a long time and where the plan sponsor's business has downsized in recent years.

Corporate finance perspective

The financial perspective on defined benefit plans for the past several decades has been one where assets and liabilities were managed mostly separately and where pension investing was viewed as a long-term endeavor. Short-term ups and downs in the markets were not a problem from this perspective, and, in fact, accounting and funding rules smoothed them away. Newer rules make short-term ups and downs more transparent and thus more of a concern for corporations and their investors, who often do not share the decades-long perspective that had pervaded pension financial management. These new rules allow and encourage a much lower risk approach to managing a pension plan and this should be viewed as a positive development. From a corporate finance perspective, there are many reasons why a corporation would not want to have significant equity and interest rate risk in their pension plan:

- Financial stakeholders in any corporation have the opportunity to invest directly in the equity market. They do not need the corporation to obtain additional exposure on their behalf in a pension plan, which introduces potential problems for the company such as making it difficult to plan capital expenditures given the uncertain costs in the pension plan.
- When the business cycle is in a downturn, equities are likely to perform poorly and interest rates are likely to drop, both of which lead to higher pension costs when a company can least afford it.
- Because uncertainty about a corporation's future financial situation is unattractive to investors, pension risk will lower the price that investors are willing to pay for equity in the corporation and increase the rate of interest that must be paid on debt. The expectation of high returns on equity investments by a corporate pension plan does not translate into a more valuable corporation.
- Because investment income from bonds is taxed at a higher rate than investment income from equities, bonds have a relative advantage when used in tax advantaged vehicles such as a qualified pension plan.
- Financial analysts view pension obligations as debt and pension liabilities, which are not funded and hedged with bonds, effectively increase leverage (financial risk) in a corporation.

One way to express all of this is that a corporation is in business to make cars (or whatever its business may be) not to invest in the stock market. While various economists, academics and actuaries have explained this perspective for at least a few decades, it is only recently that plan sponsors themselves seem to be acknowledging it and acting on it. Public statements made by GM and actions taken by other plan sponsors indicate that managing the financial impact of the pension plan within the context of the overall business of the plan sponsor has become a more important objective.

OTHER CONSIDERATIONS FOR PENSION RISK TRANSFER

Other Pension De-risking Mechanisms

In addition to risk transfer mechanisms described above, plan sponsors have other options available to reduce pension risk:

- *Liability-driven investing* – because a pension obligation is a series of promises to make future payments to another party (just like a bond), its value changes with changes in interest rates (just like a bond). Plans that invest in the right kind of bonds can significantly reduce the potential for unexpected changes in cost because the value of their investments will change in the same way, at the same time, as the value of their pension liability changes. While most plan sponsors have adopted a liability-driven perspective and many of them use longer duration bonds (pension liabilities also have a long duration), very few have moved most of their assets into bonds which match the liability, so they retain a significant amount of asset-liability mismatch, and therefore a significant amount of pension risk. More pension assets are likely to move into matching bonds as funded statuses increase and if interest rates increase. Insurance companies use a liability-driven investment approach and invest primarily in high quality, long duration bonds to cover the pension liabilities that they take on.
- *Buy-in* – a contract is purchased from an insurance company which covers a subgroup of the plan participants (typically all or some of the retirees). Financially this has the same effect as purchasing a group annuity in that the insurance coverage of benefits is fully guaranteed. However, a buy-in contract is an asset of the ongoing plan – the plan retains the entire obligation but has fully secured a portion of it. The buy-in contract is revocable, and a key potential advantage is that settlement accounting (described above) is not required. While this type of transaction has been used by many plan sponsors in the U.K., only one such contract has been sold in the U.S. to date. Expenses related to participants, such as PBGC premiums and administration, remain with the plan sponsor.
- *Insured LDI* – at least one insurance company is offering a product, similar to a buy-in, but that only covers investment risk, not demographic risk (how long people live).

All of these de-risking mechanisms and risk transfer through plan termination, lump sums or group annuity purchases have very similar financial impacts. They all "lock in" the cost of the plan based on interest rates at the time of the transaction.

The future of pension risk transfer

For reasons described above, 2012 saw much risk transfer activity focused on taking advantage of the new lump sum rules and the interest rate situation that existed in 2012. At this time, risk transfers are still happening, but activity has tapered off. There is likely to be a steady stream of risk transfers going forward which will be accelerated when interest rates rise or when funded status improves due to contributions or equity market returns.

While a substantial number of plans are likely to terminate in coming years, it also appears that a substantial number have weathered the storms of the last decade and their sponsors have remained committed to keeping the plan.

Smaller plans (< 5000 employees) are more likely to be fully frozen than closed to new entrants and these plans can be expected to terminate steadily during the next decade, with the rate of termination increasing and decreasing as conditions such as funded status and interest rates change.

Larger plans are more likely to be closed than fully frozen and these plans can be expected to terminate over a more extended period than smaller plans. Many of these plans will wait for their closed groups of covered employees to retire and they are likely to implement a termination gradually over a period of years through a series of smaller annuity purchases and lump sum offerings.

Barriers to large waves of risk transfer may arise. These would include

- challenges at insurance companies to administering defined benefit obligations for many new plans and participants
- difficulty at the IRS and PBGC with large numbers of filings
- lack of supply of long duration corporate bonds to cover pension obligations

PARTICIPANT PERSPECTIVE ON LUMP SUM OPTIONS

Participant perspective on the choice of lump sum vs. annuity

Participants who are offered the choice of a lump sum or annuity benefit have received a potentially valuable option, but the "right" choice is not an obvious one, even for a financial expert. Ultimately it will be possible to determine which option would have turned out best, but at the time a choice needs to be made, participants and their advisors can only make educated guesses about what may transpire in the future. Some of the relevant factors to consider are fairly complex financial concepts, and emotional and cognitive biases will also impact these decisions. A desire to make the best of this offer, combined with the significant potential consequences, complexity and lack of an obvious right answer for most people can make the decision-making process very stressful. Some of the factors that a well-informed participant might consider are described below.

Key Advantages of a Lump Sum from a Pension Plan

- Personal control over assets and investment decisions
- Flexibility to use the lump sum for a particular purpose
- More value received up-front in case of an early death

Key Advantages of an Annuity from a Pension Plan

- Don't have to manage assets and assume investment risk
- Guaranteed income for life
- Less expensive than purchasing an individual annuity

Other important Considerations

- *Social Security and other guaranteed income* – Social Security will provide a base level of guaranteed monthly income at retirement. Social Security offers a higher replacement rate for lower-income workers, which may reduce the need for the plan annuity, while higher-income workers may potentially seek a higher level of guaranteed replacement income. Meanwhile, the participant may have other guaranteed income sources (a prior employer pension, a spouse with a pension) that may reduce the need for the annuity.
- *Basic needs* – Often having a guaranteed source of income to cover a participant's most basic needs in retirement is desirable. If the current annuity can provide a portion of this guaranteed income, the annuity may be worthwhile. If the participant has Social Security and/or other annuity income that will meet this need, the lump sum may be more useful. However, participants' definition of basic needs varies considerably and having too much guaranteed income without inflation protection may not be appropriate.
- *Inflation risk* – A corporate pension annuity is generally permanently frozen at its current level. For younger participants, inflation may significantly erode the benefit value over many years, both to and through retirement. For older participants, inflation is still a risk, but somewhat

smaller because of the shorter period to and through retirement. The ultimate value of a lump sum payment may also be eroded by inflation to the extent investment returns are not high enough.

- *Insurance company credit risk* – Annuities from the terminating pension plan will be provided by an insurer through a group annuity contract. If the participant elects an annuity, they are exposed to the credit risk of the insurer, although guarantees are in place through state guaranty funds to protect annuity income up to certain limits. For some participants there is risk that full benefits would not be paid from the pension plan in the event the plan is taken over by the PBGC.
- *Level of assets* – For participants with substantial retirement assets, whether in retirement or taxable accounts, guaranteed retirement income may not be as important, as they are more likely to have the ability to weather the investment risks of taking a lump sum payment. Alternatively, for participants with lower savings and/or lower pay, the value of guaranteed income from an annuity may be greater.
- *Benefit level* – For participants with relatively small pension benefits that will be of little meaning to their overall retirement income, a lump sum may be preferable.
- *Early retirement benefits* – Annuity benefits provided by a pension plan may provide additional financial value in any benefit that begins before the age of 65 (early retirement benefits). These "early retirement subsidies" are not always included in the lump sum being offered, as this is not required.
- *Interest rates* – When interest rates are lower, lump sum amounts will be higher (relative to annuities) and vice-versa. Another way to look at this is that annuities are more expensive when interest rates are low. Generally it is not advisable to try to time the interest rate market, and interest rates may also impact the amount of investment return that can be expected to be earned on investing a lump sum amount.
- *Gender-specific calculations* - Lump sum payments from a pension plan are calculated to provide the same expected value as the annuity payment that the participant has earned. However combined mortality tables for men and women are used to do all benefit calculations. Since women expect to live longer than men, using combined mortality information means that women get a bit less and men get a bit more in a lump sum payment than if the lump sum value was determined based on their gender specific mortality.

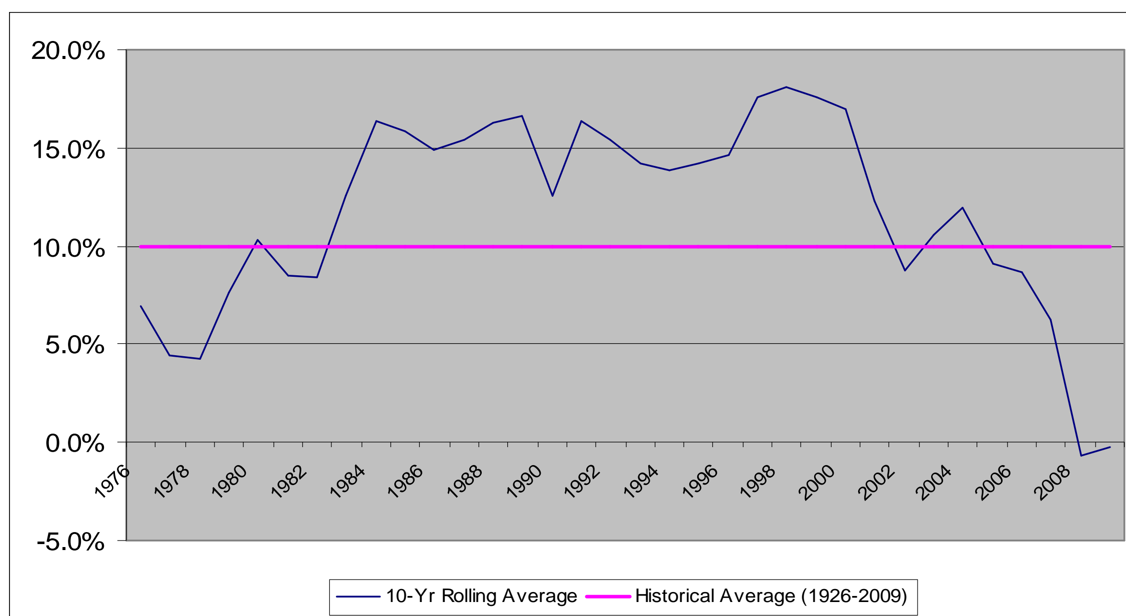
Appendix A – Historical Perspective with Data[5]

In the years following ERISA, regulatory, legislative, and market conditions made the underlying guarantees in DB plans appear to be relatively inexpensive. Financial Accounting Standard (FAS) 87 (now Accounting Standards Codification (ASC) 715) and ERISA's funding requirements allowed smoothing and delayed-recognition of liabilities.

These features reduced the impact of volatile markets on required employer contributions when plan sponsors dedicated a majority of plan assets to equities. Sponsors expected that the greater risk associated with equities would result in greater returns, reducing the need for contributions. As a result, the dominant paradigm for managing DB pension assets was a total-return approach which did not consider the role of pension liabilities. For example, in 2004, the average equity exposure for large pension plans was 62% compared to the average fixed income exposure of 29%.[6]

High equity returns also reduced plan costs substantially during the great bull market that began in 1982. In the mid-1980s through 2000, the ten-year rolling return hovered around 15%--well above the long-term average return of 10% from 1976 to 2009 (Figure 2). Notably, the highest 20-calendar-year period on record was 1980-1999, when return on equities reached 17.9.

Figure 2. Ten-year rolling average equity returns: 1976 to 2009

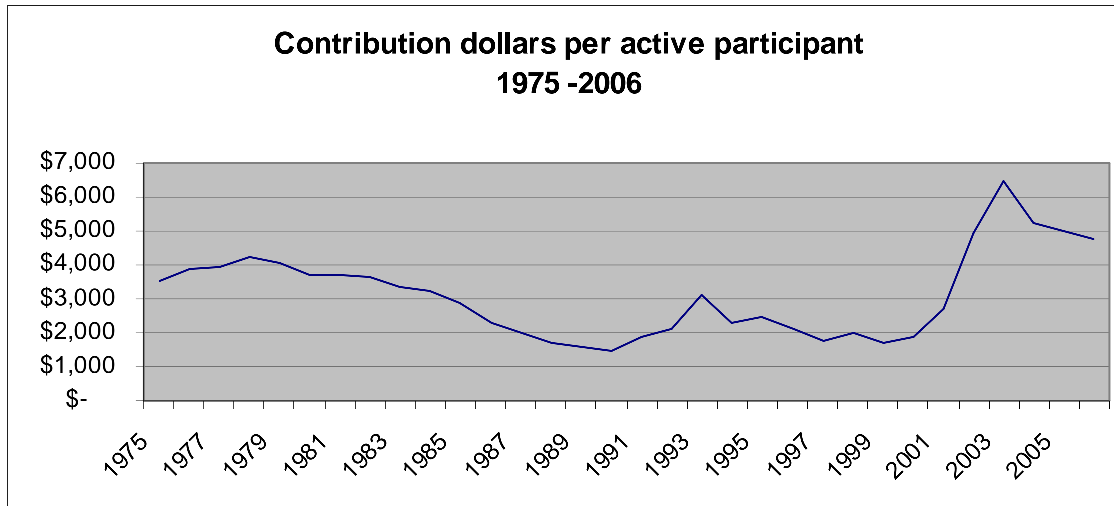


Source: When determining which index to use and for what period, we selected the index that we deemed to be a fair representation of the characteristics of the referenced market, given the information currently available. For U.S. stock market returns, we use the Standard & Poor's 90 from 1926 through 3/3/1957, the Standard & Poor's 500 Index from 3/4/1957 through 12/31/1974, the Wilshire 5000 Index from 1/1/1975 through 4/22/05, and the MSCI US Broad Market Index thereafter.

[5] Extracted from Rethinking Pensions: Shifting to a sustainable Green DB strategy, Vanguard, 2011
[6] Milliman 2010 Pension Funding Study

These high equity returns mean that a significant portion of DB plan costs were "paid for" by rising asset values, not employer contributions. In fact, employer contributions to DB plans fell by more than one-half from 1975 to 1991 (adjusted for inflation), from just over $4,000 per participant to $1,400 in 1990 (Figure 3). Contributions from 1990-2001 averaged $2,127, compared to $5,278 for the 2002-2006 period.

Figure 3. Plan contributions by year



Source: Vanguard, based on Private Pension Plan Bulletin Historical Tables and Graphs, U.S. Department of Labor, Employee Benefits Security Administration, February 2009.

During this relatively benign accounting and market environment, another fundamental shift was also taking place in the underlying nature of the pension guarantee: Liabilities were growing more rapidly than the value of the sponsoring companies. As workforces grew and aged and interest rates dropped, pension obligations grew faster than the sponsoring firms. In a universe of large plans we examined, the average pension benefit obligation (PBO) in 1989 was 22% of the average market capitalization of the company. By 2008, this figure doubled to 44%.[7] As a result, the embedded guarantees in pension plans became larger relative to the key financial metrics of the company, including market capitalization, revenues, and net income.

A final development during this period was a change in the economic philosophy governing pension accounting and funding rules. Whereas prior rules tended to mask volatility by smoothing pension performance over multiple years, a new approach emphasized market-based measurements of assets and liabilities to better convey the current financial position of the pension plan. The Pension Protection Act of 2006 (PPA) reduced smoothing and increased cash

[7] Figures based on 92 companies from the Standard & Poor's 500 Index with pension liabilities greater than $100 million at both year-end 1989 and year-end 2008. Ford, General Motors, and Kodak were dropped from the analysis owing to extreme declines in their market capitalization.

funding requirements, while FAS 158 (now ASC 715) shifted a pension plan's funded status from a footnote directly onto the employer's balance sheet.

Thus, not only were pension plans larger relative to their sponsoring companies, their results could now directly and more dramatically impact the reported profitability of the companies sponsoring them. These developments, combined with poor equity market returns and historically low interest rates, accelerated the trend toward freezing traditional DB plans.

While these changes made DB plans appear costly and risky, from Vanguard's perspective they actually highlighted a more fundamental dynamic: Financial market guarantees of any kind, whether offered through a DB plan or through other intermediaries, are costly. Indeed, the true cost of a guarantee is not its average cost over time, but its cost in extreme conditions, such as those that have characterized the past ten years. The trend toward freezing DB pension liabilities was a seemingly inevitable result of the developments just reviewed. But as we will describe, there are other strategies to manage the embedded costs of DB pension guarantees through both investment and plan design changes.