

# ***The “Crisis” in Defined Benefit Corporate Pension Liabilities: Current Solutions and Future Prospects***

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**Abstract.** Once an integral component of company-sponsored compensation schemes in many western economies, private defined benefit (DB) pensions are in decline. For many, DB schemes (and their related health care liabilities, depending on the jurisdiction) have hobbled the financial well-being of plan sponsors and even whole sectors of industry. If a constraint on shareholder value in the short-term, these schemes threaten long-term corporate survival in the emerging global economy. While there remains considerable debate over the ability of financial markets to adequately price DB liabilities, there is a growing industry devoted to estimating their long-term risks with respect to longevity, inflation and cost. In this paper, we survey the nature and significance of the problem, focusing upon UK and US private employer sponsored plans. It is suggested that the “crisis” was apparent, for those willing to look, a decade ago. Its significance was papered-over by the 1990s stock market bubble and high interest rates but has returned through what many analysts identify as a “perfect storm”. Having documented the nature and scope of the “perfect storm”, we also evaluate proffered solutions to the crisis, such as financial engineering, government intervention, and private sector negotiation. In the final sections of the paper, we set-out the principles that should guide the design of new kinds of employer sponsored plans noting that if, as suggested by many experts, western economies are entering an era of increasing labor shortage, private pensions will continue to have an important role in managing human capital.

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**JEL Codes.** G20, G33, J50

## *CAVEAT LECTOR*

- In this discussion paper, we raise contentious issues and draw controversial conclusions (no doubt some will even find our opinions to be disquieting). We see this as one of the strengths of our paper. Through argument, interrogation and a comprehensive survey of the issues our goal is to take the reader beyond the current defined benefit pension “crisis”.
- The term “pension crisis” is part of the political, financial and even popular lexicon. However, some readers find this expression contentious, seeing it as a gross and unwarranted generalization since only a small set of funds face severe underfunding. Even so, we feel strongly about the fact that defined benefit pensions are facing a crisis. Currently, the circumstances facing the concentrated group of severely underfunded companies is so frequently debated in public commentary that it has put-in-play the very future of the defined benefit pension institution.<sup>1</sup> In addition, plan sponsors, looking towards the future, have recognized the instability of the defined benefit pension due to hard to quantify and at times unhedgeable risks, leading firms with even solvent defined benefit pension plans to close to new entrants. This widespread retreat from an economic and social institution half-a-century in the making is in our opinion nothing short of a “crisis”.
- We do not claim to resolve the pension crisis in the pages that follow, nor do we have a monopoly on telling the story of defined benefit pensions. Rather, an opinion paper like this has its value in its catalyzing effect on discussion. Given that we wrote it as the background paper for a conference examining defined benefit pension liabilities, this seems particularly appropriate. We expect the paper will serve to invigorate constructive dialogue by loosening entrenched views and convictions in the hope of promoting innovation with respect to the future of defined benefit pension systems in the private sector.
- We draw upon our knowledge of the United Kingdom and United States in order to make a larger argument about defined benefit pensions. Though we try to reference differences where they exist, we acknowledge that grouping them together, at times, may do injustice to each country’s individual characteristics and particularities. This is especially apparent in issues relating to UK and US funding rules and regulations.

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<sup>1</sup> Perhaps the “small” group is not so small: recent analysis by Credit Suisse shows that 78 of the S&P 500 firms were less than 70% funded at the end of 2005.

## EXECUTIVE SUMMARY

- Now more than ever, there is a need to reinvigorate private involvement in an eventual solution to the pension crisis so as to avoid an institutional failure and government bailout (see introduction).
- The traditional scapegoats for the pension crisis (lack of accounting transparency, asset returns, interest rates, etc.), rather than causing the crisis we know today, may have actually allowed traditional DB pensions to exist longer than they might have otherwise (see section one).
- Pension liabilities are not reliably quantifiable, not legally tradeable, not cheaply retireable, and not easily transferable – in other words, not like traditional debt (see section two).
- Despite the collective social interest in retirement benefits, we must acknowledge that there is also a collective interest in the market competitiveness of job producing firms and industries (see section three).
- In order to make a fresh start, negotiations need to combine targeting “cost-cutting” with “risk-cutting” (see section four).
- No firm should have a pension interest in declaring bankruptcy, but those US firms with debilitating DB pension obligations are seemingly left with no other option. In the UK context, The Pension Regulator is heavily invested in negotiating “settlements” outside of insolvency proceedings (see section five).
- Financial markets have a crucial role to play in resolving the pension crisis. However, this role is not, as was hoped by some, the panacea (see section six).
- Coming to grips with the true cost of retirement is vital in constructing a sustainable pension deal (see section seven).
- The success of any institutional solution or reform relies on maintaining firms’ economic competitiveness while minimizing the harm to employees (see section eight).
- Bearing in mind that there is no “silver bullet” or cost- or risk-free solution to the pension crisis, a road map is necessary so those firms faced with the burden of a DB pension can calibrate what is at stake and what choices are available (see conclusions).

## **INTRODUCTION**

Defined benefit (DB) pensions are present-day corporate burdens, inherited from a past generation of employees and managers that, in severe cases, jeopardize the very solvency of their sponsoring firms. The DB pension model in the private sector is at great risk, as highly publicized instances of underfunding and the prospect of plan failures threaten an entire institution that was once thought inviolate.<sup>2</sup>

**Past.** DB pension systems were built incrementally (“brick-by-brick”) over the course of more than 50 years. Each additional “improvement” to plan benefits was relatively small, with little in the way of individual accountability for the accumulating costs and growing risks despite the fact that these costs and risks were (and are) substantial.<sup>3</sup> Moreover, thanks to countervailing financial market trends, DB pensions became huge financial institutions within the private sector. The strength of the equities market and relatively high interest rates (at different moments) made each benefit increase or contribution holiday appear sustainable at a given point in time. In addition, UK and US governments facilitated DB pension growth via tax breaks for most categories of employment. Trends such as these deflected the urgency of a solution, allowing plan sponsors and their advisors to deny the existence of a problem.<sup>4</sup>

In fact, close-at-hand but largely ignored, were three difficult-to-hedge risks that have proven devastating to DB pensions. First, mortality experience directly influences a company’s cash payouts since improving life expectancy increases the number of retirees entitled to benefits. Failure to anticipate future improvements in longevity have proven

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<sup>2</sup> While each industry has its own story to why DB is no longer working (legacy costs, moral hazard, etc.), the broad consensus at a recent high level conference on pension liabilities organized by the authors (that brought together roughly 47 acknowledged “pension experts”) was that the current private sector single employer DB pension system may not be sustainable over the long-term (See: [www.ouce.ox.ac.uk/news/phclcs/](http://www.ouce.ox.ac.uk/news/phclcs/) for details on the pension liabilities conference held May 26, 2006).

<sup>3</sup> We do not believe people at the time were able to look forward to calculate the cumulative consequences of their actions – this is a statement of interpretation (i.e. from interviews) and a statement of individuals’ cognitive abilities (Kahneman and Tversky, 1979).

<sup>4</sup> Still, 25 years ago the problems were already apparent to some (Feldstein, 1981, and Feldstein and Seligman, 1981).

costly. Second, inflation risk can be serious for those firms that index pension benefits since it complicates the task of estimating liabilities over the long term.<sup>5</sup> Third, cost risks, which refer to the vulnerability of the plan sponsor to wage inflation and regulatory changes, have proven significant over the past few decades. These “unhedgeables” are key variables within DB benefit plans and render the sponsor particularly vulnerable to their volatility. Ultimately, when the stock market bubble burst in 2001 and real interest rates dropped, the “brick-by-brick” additions of costs and risks were finally exposed to be a huge burden on plan sponsors: firms found themselves up against a brick wall.<sup>6</sup>

**Present.** Plan sponsors having inherited longevity, inflation, and cost risks from past generations are faced with difficult choices given that the post-bubble environment of modest growth in assets and low interest rates has amplified the magnitude of the problem. Indeed, rapid and unanticipated increases in pension obligations have put at risk some of the largest corporations on both sides of the Atlantic.<sup>7</sup> Reminiscent of the US Savings and Loan catastrophe of the 1980’s, the prospect of a multi-industry government bailout has emerged over the last five years as firms look to shed their pension liabilities in any way possible.

However, remediation of past problems is proving difficult due to clashes between private and public solutions to the pension crisis. Now more than ever, there is a need to reinvigorate private involvement to avoid institutional failure and government bailout. Ideally, private solutions should redistribute risks and costs of contributions thereby rendering DB pensions “manageable”. However, current government regulation in the form of benefit insurance (PBGC, PPF), bankruptcy (Chapter 11), and funding rules (ERISA, Pensions Act 2004) are having market distorting effects due, in part, to moral

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<sup>5</sup> This is not much of an issue in the US since most DB plans are not indexed. However, its effects could be very significant in the UK even if UK price inflation has been low and stable for roughly a decade.

<sup>6</sup> These risks and costs did not go totally unnoticed. The provision of defined contribution (DC) plans by many of the largest US employers as an alternative and sometimes as a supplement to DB pensions can be interpreted as an incremental response to the acknowledged and growing liabilities (see generally Munnell, 2006).

<sup>7</sup> Indeed, roughly speaking, the drop in long-term interest rates between 1999 and 2002 increased the value of DB pension liabilities by 30-40%. The future term structure of interest rates is one of the great unknowns in financing future pensions. However, plain vanilla interest rate swaps are a good hedge to this risk exposure.

hazard and have stymied the private sector process of resolution by making public institutions a first-order choice.<sup>8</sup>

**Future.** The increased possibility of institutional failure warrants a plan of action. If negotiated solutions were viable, if government regulation could be changed to alter the incentives pushing firms towards bankruptcy, and if the “unhedgeables” could be countered with innovative financial or insurance products, then a path towards more sustainable single employer-sponsored DB pensions might be possible. Indeed, DB-type pensions may be once again favored by employers looking to a future likely characterized by increasing shortages of skilled labor. However, the fact that these conditions are difficult to specify let alone meet demonstrates why the pension crisis is in fact a “crisis”. Firms like General Motors are emblematic of the gathering disaster.

**Plan of Action.** This paper has eight sections. First, we argue that the pension crisis is the product of overly risky investment strategies for pension assets with little or no regard for pension liabilities (section one). This is combined with a dysfunctional pension construct that handicaps businesses in an era of heightened market competition (section two). It is shown that the impact of the DB pension crisis, notwithstanding bailouts restricted to a narrow set of firms and industries, could be wide-ranging (section three). Next, we suggest that the current toolbox of solutions, such as negotiated agreements between the implicated parties (section four), government regulation (section five), and financial products structured to better match with liabilities (section six) are inadequate. Subsequently, we show that the dearth of viable long-term solutions stems, in part, from an inability to reduce the high cost of DB pension obligations, since contributions must be high enough to pay for what may be decades of inactivity (section seven). Finally, we argue that distributing the high cost of occupational pensions in a manner that does not impact in unintended ways the core operations of the plan sponsor is necessary (section eight).

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<sup>8</sup> US and UK differences are not negligible. For example, the UK Pension Regulator is committed to negotiating outside of insolvency; such an agency does not exist in the US. Nevertheless, our matching of US and UK regulatory counterparts is appropriate as each stymies the private sector process of resolution by making public institutions a first-order choice.

We conclude the paper with a road map for plan sponsors intent on evolving towards less constricting pension provisions. We believe DB plan sponsors have four available options. Plan A suggests that removing the DB pension and replacing it by an “intelligent” defined contribution pension, though extremely difficult and costly, may be the best option for the long-term.<sup>9</sup> Plan B offers the “next best” solution, suggesting that an innovative remade DB pension model, such as a hybrid pension, could be effective. Plan C offers an option for firms that can neither implement A or B. It proposes using a multi-employer DB pension as a way of minimizing risks to sponsors. Finally, plan D is a non-employer contributive pension option.<sup>10</sup> In all cases, our paper concludes that the path forward should be a private-sector solution (perhaps facilitated by government interventions) that achieves a new pension structure in which workers, employers and shareholders share the pension cost (though perhaps not the pension risk) cooperatively and fairly for the benefit of all parties.

## **1) Managing the Burden**

### ***1.1) Rose-Colored Glasses***

By 2002, underfunding amongst DB pension plan sponsors in the UK and US was widespread, causing alarm and spurring government inquiries on both sides of the Atlantic.<sup>11</sup> It was determined that the pension crisis stemmed from two conjoint problems. First, DB pension plans’ investment and funding policies had failed to account for the latent risks inherent to DB pension obligations. Second, complicated and opaque

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<sup>9</sup> At the author’s recent conference on pension liabilities, it was frequently argued that while DC appears to be the future of employer provided pensions, a set of “best practices” is desperately needed to establish governance procedures, contribution rates and payout principles for retiree income security.

<sup>10</sup> Questions were raised at the conference regarding the suitability of the modern corporation (with all of the competitive requirements placed upon it) to act as a guarantor of the pension. Indeed, it was argued that the decline in corporate paternalism and the declining longevity of plan sponsors compared to pension benefits suggests greater insecurity than often recognized. The life cycle of the corporation is increasingly out of sync with the life cycle of the pension (see conclusion).

<sup>11</sup> While most of the specific references in the paper refer to the UK and US, Canadian problems and solutions look very similar. For a more specific reference to the Canadian situation, see Keith Ambachtsheer’s (2006) Pension Revolution I and Pension Revolution II.



actuarial assumptions as well as accounting methods and rules had obfuscated pension costs and obligations. Particularly important in the US, plan sponsors were afforded by governments and professional bodies high levels of discretion in calculating and funding their pension obligations, allowing them to ignore their most pressing problem – exploding pension liabilities – while maintaining the façade of stability (Zion and Carcache, 2005). Below is a discussion of the factors that led, in part, to the pension crisis.

**Asset Management.** With pension assets averaging double-digit returns in the 1990's, pension plan trustees focused on pension asset management to the detriment of their pension liabilities. Meanwhile, they took advantage of high asset values and returns by taking contribution holidays and increasing net income by reporting pension asset income as corporate income. In addition, rocketing asset values enabled benefit increases for employees and the introduction of cost-of-living adjustments for some retirees without triggering additional contributions by the sponsor. In fact, from 1995 to 2002, roughly 2/3 of the largest US plan sponsors made no cash contributions to their pensions due to accounting credits.<sup>12</sup> Managing assets without regard to liabilities was comprehensible given the context but precarious.

Experts contend both that the equity risk premium has shrunk with little confidence of the gap re-opening in the future and that pension fund trustee competence with respect to capital investment strategies remains suboptimal (Shiller, 2002).<sup>13</sup> Undeniably, our rose-colored glasses have come off and asset-liability management strategies have moved to reverse gear. An often cited trend among today's DB plan sponsors is "risk immunization", which takes liability management and matching to the extreme. Those that rode asset values and interest rates in the 90's are now seeking long-dated government bonds in markets saturated by demand.

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<sup>12</sup> GAO, Report # GAO-05-294

<sup>13</sup> This raises the issue of trustees' role in the pension crisis. The current trustee model is strained. Recent research has raised questions as to the competence and consistency of trustee decision making (see for UK evidence Clark et al, 2006a and 2006b for details.)

**Actuarial Shortcomings.** Plan sponsors' shortsighted behavior during the bubble years was made possible, in part, by obscure and opaque funding rules. There were several reasons why even the "best practice" guidelines for providing funding targets were ineffective.<sup>14</sup> Actuarial advice often incorporated expected returns on the backing pension assets when determining funding targets – or, more precisely, when determining the assets necessary to fully fund obligations. This meant that a riskier investment with a higher expected return could in fact lower the size of the funding contributions. Amplifying this concern, Cowling, Gordon and Speed (2005), in a paper to the UK Institute of Actuaries, expressed unease over "an element of self delusion within the actuarial profession; regardless of the reference to expected returns, using a higher discount rate is simply a way of reducing the pace of funding, i.e. advising lower contributions now (at the expense of potentially higher contributions later and lower member security)." This practice is the opposite of what would occur in the insurance industry, where riskier investments require *more* assets in order to secure the liability (Cowling, Gordon, and Speed, 2005). The problem is the actuarial connection between assets and liabilities. What a fund does with its assets affects future funding levels, but this must remain separate from the current funding targets (Exley, Mehta, and Smith, 1997).

In addition, actuaries have had difficulty anticipating the impact of increasing longevity on DB pensions notwithstanding their reliance on official life tables.<sup>15</sup> According to US official life tables in 1958 a 20-year-old American (men and women combined) could expect to live an average of 52.2 more years. By 1976, a 20-year-old could hope for another 54.6 years of life on average. By 1989, a 20-year old could expect on average to live another 55.7 years. Finally, in 2002, a 20-year old could expect to live another 58.2 years on average. Thus, plan sponsors, having agreed to a DB pension in 1958, might end up paying for six more years of employee benefits than planned – academic research has shown that DB costs have increased by 1% per year compounded annually due to

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<sup>14</sup> We are not implying any element of intent by actuaries who used what was termed best practice. We simply want to highlight how best practice may have been flawed.

<sup>15</sup> To actuaries' credit, other more reliable methods for pricing these liabilities remain elusive, as legislation often impedes the formation of a market in pension obligations from which a fair value could be determined (Jones et al., 2005).

increasing longevity (Muir and Turner, 2003).<sup>16</sup> These longevity trends are apparent in all OECD countries.<sup>17</sup>

Moreover, improvements in longevity are set to continue into the future. The UK Government Actuary's Department predicted that one million people could live to the age of 100 by 2074, as compared with only 10,000 today (though this figure could end-up being more like 350,000 due to obesity and other health hazards). Overall, underestimating longevity has proven expensive for plan sponsors and is all the more damaging due to the unhedgeable nature of the risk.<sup>18</sup>

**Accounting Shortcomings.** Nontransparent financial reporting was an equally important contributor to today's pension crisis. Though UK and international accounting practices have been reformed (witness FRS 17 and IAS 19), the US Financial Accounting Standards Board (FASB) Statement 87 still allows companies with defined benefit pension plans to "smooth" asset values, which may produce misleading company accounts. Pension obligations and matching assets have been poorly reflected in US corporate balance sheets (though this is soon to change). Accounting rules have allowed this information to be reported in the footnotes, resulting in balance sheets that are difficult to understand. As a CFO of a multi-billion dollar plan sponsor told us, "accounting for pensions is a dog's breakfast of assumptions and disclosures".

Although Feldstein and Mørck (1985) believed financial markets could see through the "pension veil", reservations remain over the ability and willingness of analysts and investors to properly assess pension deficits and surpluses in forming their valuations.

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<sup>16</sup> Assuming: "an average retirement age of 62 in both 1982 and 2002, an interest rate of 4%, and no inflation indexing of benefits".

<sup>17</sup> However, mortality estimations are different between countries. As such, according to Dorothee Franzen (private communication), if the Danish mortality tables were used in the UK context pension deficits would be considerably smaller, suggesting there remain issues of policy and choice that merit further examination.

<sup>18</sup> This is remarkable given that observed trends in mortality were the subject of informed "guess-timates" nearly 30 years ago. For example, Fries (1980) using data available at that time, calculated the "ideal" life span to be roughly 85 years. According to Fries, average life expectancy should be expected to converge towards the ideal life span, but never exceed it. Setting life-span at 85 in 1980 should have profoundly impacted actuarial practice and pension funding. However, longevity estimates were not fully informed by the evidence emerging in the medical research communities.

Coronado and Sharpe (2003) showed that the market pays more attention to “the flow of pension-induced accruals reported in the body of the income statement than to the marked-to-market value of pension assets and liabilities reported in the footnotes”. Picconi (2004) showed that analysts and investors fail to adequately incorporate pension information in their corporate valuations, and Zion and Carcache (2005) argued that a change in current accounting practice towards more transparency would negatively impact company valuations for firms with underfunded pensions. Finally, Franzoni and Marin (2006) found evidence of significant overvaluation for DB plan sponsors with large pension deficits. They contend that overvaluation stems from investors not fully incorporating pension plan underfunding into their calculations on future earnings and cash flows until the impact of the underfunding actually appears on the income statement. They also show that the market is consistently “surprised” by the low earnings of underfunded plan sponsors.<sup>19</sup>

As a result, the FASB recently agreed to examine the accounting for pension and other post-retirement employee benefits (OPEB). In an effort to improve transparency, the accounting standards board will require firms to shift information on the funding status of plans from the notes onto the balance sheet. Furthermore, the FASB has announced it will reconsider all aspects of OPEB and pension accounting. The FASB is likely moving closer to international accounting standards and the mark-to-market approach, which does not allow for the many smoothing mechanisms currently available under US accounting regulations (Zion and Carcache, 2005).<sup>20</sup>

## ***1.2) True Burden Exposed***

Some of the dangers of DB pension obligations were known decades before the pension crisis. High levels of inflation in the 1970s had discounted the real value of many

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<sup>19</sup> See Li, Bodie and Merton (2005) for an alternative view that claims that pension plan systematic risk is reflected in firm equity risk.

<sup>20</sup> FRS 17’s mark-to-market approach had a large and unexpected impact on UK plan sponsor behavior, particular with respect to pension plan investment and management. For example, “triennial asset mix reviews” may be obsolete due to the more stringent time pressures associated with mark-to-market accounting. This is likely to increase costs of investment management dramatically. Similar reactions in the US should be expected.

retirees' benefits, and had prompted retiree demands for indexation. No doubt, this policy had merit, given beneficiary welfare, but it required care with respect to implementation.<sup>21</sup> According to Feldstein (1981), switching to a fully indexed pension for a male aged 65 years (assuming 6% per annum) from a nominal pension benefit would increase the pension cost by 50%. In order to sustain such costs, firms would have needed to institute a much lower starting pension benefit or a lower wage, or both, advice that was largely ignored. Instead, countervailing trends, in particular the strength of asset market in the 1990s, distorted perceptions of these inherent risks and prompted postponement of a solution.

**Perfect Storm I.** The current pension crisis can be viewed as a “perfect storm” of low asset returns and interest rates. These financial factors resulted in a dramatic reversal in funding levels. So unexpected was the confluence of these two phenomena in 2001 and 2002 that few sponsors had run “stress test” scenarios of such an outcome. Consequently, pension fund trustees, their advisors, and even asset managers did not anticipate such an event because it was outside of their risk parameters.<sup>22</sup> This had devastating effects on pension plans: as lower discount rates increased the value of expected liabilities, the assets intended to cover these liabilities fell dramatically in value. This perfect storm of declining interest rates and asset returns took Fortune 1000 plan sponsors from an average funding level of 122% in 1999 to 76% in 2002 (Coronado and Hewitt, 2005).

**Perfect Storm II.** The actuarial implications of the first perfect storm set-off a regulatory perfect storm that has had dire consequences for plan sponsors. In a short period, UK pension funding regulations went from lax to strict, thereby exacerbating firms' funding schedules.<sup>23</sup> As noted earlier, pension liabilities in the 90's were off-balance sheet,

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<sup>21</sup> This is now primarily a UK phenomenon (since 1997 and the Labour Government's change of policy). The majority of US plans do not have to automatically index benefits.

<sup>22</sup> Nevertheless, many pension funds likely had “deflation” as a scenario, but they were not managing there decisions relative to it.

<sup>23</sup> For example, the UK's first attempt to directly regulate by statute employer-sponsored DB pensions came in the 1995 Pension Act, which has since been followed by the 2004 Pension Act. Paradoxically, the 1997 change in Treasury regulations denying pension funds' dividend tax credit has dramatically adversely affected plan-funding schedules. In the US, efforts to reform ERISA have been slower moving, as pension reform is only now making its way through Congress.

funding schedules were relatively flexible and, anyhow, plans were healthy (according to the assessment methodologies used at the time). Today, the situation is drastically different, as regulators try to secure benefits and increase transparency. Now that liabilities are on (or moving onto) the balance sheet, there are also much stricter funding rules (see section five). Also, the much-derided discretion afforded to plan sponsors, intended to keep costs at reasonable levels, is gone. Thus, in the current environment, with funding levels low and costs increasing, DB pension obligations represent enormous burdens on their sponsoring firms. Pension underfunding is a problem as yet to be resolved (See Box I for details of funding levels in the UK and US).

**Too Risky.** The rapid increase in pension costs over the past few years has demonstrated that plan sponsors have taken on unhedgeable risks that can no longer be concealed. Unveiling these risks led to an unexpected possibility: the traditional scapegoats for the pension crisis (accounting opacity, asset returns, interest rates, etc.), rather than causing the crisis we know today may have actually allowed traditional DB pensions to exist longer than they might have otherwise. Perhaps the DB plans inherited from the post WWII era were defunct long before the pension crisis, and the asset bubble of the 1990s simply delayed their downfall? If this were true, it would suggest that a deeper set of issues are at the root of DB pension underfunding and closures in the UK and US.

## **2) Market Failure**

### ***2.1) Dispelling Myths***

The dramatic bursting of the stock market bubble in 2001 and the decline in long-term interest rates exposed the dangers for DB plan sponsors. Indeed, traditional DB pensions have been described as unmanageable burdens for 21<sup>st</sup> century firms (Clark, 2005). Nevertheless, some academics, unions, employees, fund managers and even government representatives argue that DB pensions are sustainable, that pension liabilities are nothing more than debt, and that insurance markets offer DB pensions a sustainable solution or

alternative. These myths must be dispelled before we undertake an in-depth examination of DB pensions' impact on sponsoring firms.

**Not “just debt”.** The 1974 passage of the Employee Retirement Income Security Act (ERISA) in the US, and the 1995 Pensions Act in the UK, had the effect of taking pension promises and making them pension guarantees akin to traditional debt. However, pension liabilities are not reliably quantifiable, not legally tradeable, not cheaply retireable, and not easily transferable – in other words, not like traditional debt at all. How do you define property rights with respect to private DB pension benefits? The cash outflows promised in a DB pension do resemble bond coupons. However, the tail of the pension liability has a much longer duration and the structure of the pension agreement creates special cases where bond-like valuations are no longer appropriate (Cardinale, et al., 2005). The key differences between pension liabilities and traditional debt are the various “unhedgeables” common to DB pension deals. These elusive risks translate into pension liabilities that affect sponsors' balance sheets in unpredictable ways, differentiating pension debt from generic corporate debt.

**Not Insurance.** Due to the unknowns associated with a DB pension, plan sponsors have recently sought to transfer the liability risk of their DB plans to insurers by purchasing bulk annuity plans. However, many DB plan sponsors had originally decided to manage their pensions in-house to avoid the higher costs associated with securing benefits with a life insurer. Insurance is not a preferred or even desirable alternative to a DB pension; insurance companies need to make a profit, have higher capital adequacy requirements, and have lower legal tolerance for unhedgeable risks that leads to conservatism in pricing.

## ***2.2) DB Handcuffs***

Today, the ultimate responsibility of pension obligations remains with the plan sponsor, despite the fact that pension plans were established as separate entities with the specific task of covering benefits. Consequently, a mismatch of assets and liabilities in a DB

scheme can have a serious impact on the valuation of the firm as a whole. Underfunding can, and does, result in the diversion of valuable capital to fill a gap in the sponsors' pension funds (Exley, Mehta, and Smith, 1997).

**Temporal Dilemma.** Given that pension contributions divert revenue away from investment, management is strongly motivated to keep pension contributions as low as possible.<sup>24</sup> This creates a temporal conflict in which management must decide between 1) higher contributions today with lower levels of investment and lower market competitiveness in the future, or 2) higher levels of investment today with the likelihood of much higher pension contributions sometime in the future.<sup>25</sup> As such, resolving this dilemma depends a great deal on the discount function of shareholders (i.e. how much they value today compared with tomorrow).

When industry peers have significantly lower pension contributions, the choice is clear-cut if nonetheless problematic. For example, in the US automotive sector pension and medical expenses make up \$1,360 for each GM vehicle, but only \$107 for each Honda vehicle made in the US (Fabozzi, Focardi, and Jonas, 2005). Moreover, as restructuring at GM accelerates, more and more people are added to the roll of retirees adding even more costs to the company pension plans. How can GM be expected to increase current contributions to its pension plans and maintain its long-term competitiveness against Honda? In this context, it seems reasonable to suggest that the current pension crisis is the product of successive managers' and workers' willingness to push DB funding obligations onto subsequent generations of managers and employees.

Corporate executives, such as GM CEO Rick Wagoner, have lobbied for government to address the issues. In his words, pension and healthcare liabilities "put US manufacturers at a severe disadvantage to overseas competition...the cumulative effect of many well-intentioned policies that now harm American manufacturing and our nation's ability to

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<sup>24</sup> Rauh (2006) found a "strong and significant negative response of capital expenditures to required pension contributions". In fact, he estimated that for every dollar of mandatory contributions to the pension fund, capital expenditures would decrease by 60-70 cents.

<sup>25</sup> Paradoxically, a growing firm with increasing investment and an ever-expanding work force could appear to have a DB plan that is increasingly inexpensive thanks to new participants at younger ages.



compete effectively in the global market place”.<sup>26</sup> Wagoner, like previous corporate manufacturing executives, is determined lawmakers acknowledge the crippling effect of legacy costs.<sup>27</sup> In an industry that has seen profit margins drop from roughly 8% to 3%, automakers’ pension costs directly impact the competitiveness of the sponsoring firms by siphoning money away from much needed research and development.<sup>28</sup> In fact, after GM decided to freeze its “white collar” DB pensions in March, 2006 (“blue collar” pensions were safe due to union contracts), Wagoner said “in many cases, our non-US based competitors do not have comparable legacy costs, because retirement benefits for employees and retirees in their home countries are more heavily government funded...So our legacy costs in pensions and health care are an area of significant competitive disadvantage for us.”<sup>29</sup> In 2003, GM contributed an astonishing \$18.5 billion to its US pension plans.<sup>30</sup>

**Impaired Capacity.** GM’s precarious situation is but one example of the crippling effect of legacy costs. Indeed, many of the problems faced by the modern firm stem from an escalation in prior commitments that impinge on its ability to respond to technological innovations (Jensen, 1993). In effect, these prior commitments block firms from mobilizing their resources to compete successfully in the modern economy, leaving them stymied when struggling for survival. Capitalist economies by nature build and dismantle institutions according to incentives (positive and negative); that which was built should be destroyed once it is no longer useful or is counterproductive. All economies have inherited institutions that are in constant competition with newly created ones, reinforcing their existence in some cases and jeopardizing it in others (Clark, 2005). Competition can be regulated, but regulation may suppress or distort the innovation and renewal necessary for firms to react to an increasingly competitive world.

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<sup>26</sup> Remarks to Economic Club of Chicago on February 10, 2005.

<sup>27</sup> The question was raised by Teresa Ghilarducci at our recent conference whether legacy costs do in fact impact competitiveness. She argued that it was more likely that poor management of core operations had lead to legacy problems. This claim, and counter-claims, are hard to distinguish since determining direct causality with respect to legacy costs is nearly impossible due to the numerous cross correlations.

<sup>28</sup> See article by John Lippert entitled Detroit Breakdown, Bloomberg Markets, October 2003.

<sup>29</sup> Mackintosh, James. GM to Slash Liability with Pension Freeze. Financial Times. March 8, 2006.

<sup>30</sup> GM Annual Report: 2003. Management Discussion and Analysis of Financial Conditions and Results of Operations. Financing Structure.

Unfortunately, the DB pension is a significant impediment to this renewal. To be sure, this type of pension was an important instrument for managing labor resources through to the 1980s (Clark, 1993). It created solidarity and loyalty amongst employees within growing firms while allowing for a livable retirement, thereby underpinning thirty years of economic growth. But the firm is an evolving entity. As such, it can not be held to account for the way that pension deals were negotiated half a century ago. In essence, current pension deals are based on an obsolete conception of the firm.<sup>31</sup>

**‘Knot of Contracts’.** Even if traditional DB pension management could be streamlined, the changing nature of the Anglo-American firm is such that DB coverage rates of the 1970s are unlikely to return (Clark and Hu, 2005). The large firm is increasingly a global entity, with new models of labor management, motivation and compensation. Whatever the private and social benefits of providing supplemental pensions, an analysis of occupational pension provision must first take place from within the firm, since the original rationale for offering DB pensions was based on labor management not social justice. The inherited DB institution has resulted in a “knot of contracts” that constrains firm renewal and renovation necessary for success in the global economy, not easily unraveled or renegotiated. The real challenge for the 21<sup>st</sup> century is to create pension structures that do not look back or freeze corporate evolution.

### **3) Scope of the Problem**

#### ***3.1) Components of Crisis***

Plan closures are increasing and widespread. Over the past three decades the PBGC has taken-over more than 3,600 plans.<sup>32</sup> In the UK, roughly three quarters of the FTSE 100 firms have closed their DB pension to new entrants and some have unilaterally changed the pension promise for those people in the plan. While the pension crisis threatens to

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<sup>31</sup> See Roberts (2004) for an analysis of the firm in the new economy.

<sup>32</sup> According to the PBGC (<http://www.pbgc.gov/media/index.html>)

engulf governments in a massive bailout, it is actually restricted to a narrow set of firms in a narrow set of industries. From 1980 to 1998, while the percentage of US private workers with an occupational pension remained between 50-60%, those with a DB private pension fell from 80% to 45%.<sup>33</sup> In 2003, 72% of unionized employees participated in a DB pension, as compared with only 15% of non-unionized workers. But private-sector union coverage in 2005 was only 7.8%, and concentrated in select industries: 24% of transportation and utilities workers, 21.4% of telecommunications workers, 13% of manufacturing workers, but only 2.3% of financial services workers, 2.7% of professional and business services workers, and 3.1% for leisure and hospitality workers.<sup>34</sup>

**Big Enough to Fail.** Paralleling union concentration, the pension crisis has been limited to a handful of industries: the steel industry in the 80's, the airline industry today, and the automotive industry tomorrow. Certain firms are particularly vulnerable to DB's "knot of contracts". These are large manufacturing firms in global industries with highly unionized local workforces, offering generous, open (or in some cases closed) DB pensions.

There are several reasons why these types of firms are particularly vulnerable. First, market competition is forcing these firms and industries to reevaluate and close large segments of their inherited production capabilities. Second, higher real incomes worldwide have encouraged more taste-based consumption decisions, rather than need-based decisions. Finally, the never-ending quest for product differentiation and market segmentation has forced firms to innovate and develop many new products to fill ever-expanding demand (Yankelovich and Meer, 2006). Thus, niche products threaten the scale of large manufacturing firms' product-lines, attacking both the nature and level of employment by production unit (and ultimately the demand for DB plans) precipitating institutional or organizational transformation.

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<sup>33</sup> The figure of 45% overestimates "current" plan coverage since this number includes those that carry deferred benefits.

<sup>34</sup> Data according to US Bureau of Labor Statistics: see [www.bls.gov](http://www.bls.gov) for details.

To compete in the global economy of tomorrow, innovation must be quick and efficient, in ways that allow for cost-effective production and competitive pricing (Zingales, 2000). Flexible production lines, both onshore and off, are increasingly in demand. Firms burdened with DB pension obligations may be too slow and cumbersome to be successful in this challenging environment. Likewise, the burgeoning medical expenses of US firms – union and non union – engender similar problems to DB pension liabilities. While market competition tightens in the face of globalization, the benefit structures of whole countries may be put in play. DB pensions have special status because the pension crisis is so concentrated in certain private sector industries.

### ***3.2) Evaluating Welfare***

Within the current pension crisis are issues of equity and well-being. Denying pension promises after they have been accrued and maintaining pension promises at the expense of later generations diminish the welfare of current and future retirees. Pension plans have had very important social roles, inside and outside of the plan sponsor, and default has serious implications for workers and retirees and their communities. Moreover, the most popular alternative, DC pensions, are far from being reliable mechanisms for providing adequate retirement security. This is a problem for future generations of taxpayers and could become a second dimension of a long-running pension crisis for much of the developed world (Munnell, 2006).

**Longevity & Participation.** It was only after WWII that extended retirement years became commonplace and employer-provided pension plans became an integral part of national retirement systems (Sass, 2006). Over the same time frame, the average health of people has improved, the intensity of physical labor in the manufacturing sector has diminished, and computerization has enabled older people to work longer in today's economy (Johnson and Steuerle, 2004). Even so, labor force participation rates of older generations have fallen. In 1940, two-thirds of US men aged 65 years participated in the workforce, compared with only 38% in 2001 (Johnson and Steuerle, 2004). Likewise, over the course of the 20th century, in the UK the average retirement age fell despite

huge gains in longevity (Stammers, 2002).<sup>35</sup> Evidently, any attempt to reform DB occupational pensions has to come to grips with changes in labor market participation.

**Job Production.** Despite the collective interest in retirement benefits, we must acknowledge the collective interest in the economic competitiveness of firms. If one accepts that inherited DB pension burdens are like a “sandbag” on corporate dynamism, then the presence of a DB pension could ultimately create problems for market competitiveness and translate into fewer jobs created. However, the social benefits of vital job-producing industries are perhaps greater than the generous pension benefits for retirees (especially if we acknowledge how isolated those people are in the private sector with access to open DB schemes). To think otherwise is to privilege a select group of retirees over current workers, giving the older generation a claim to resources that could secure their children’s long-term interests.

#### **4) Framework for a Negotiated Solution**

##### ***4.1) Negotiations Require Sacrifice***

It is arguable that these “competition and equity” imperatives have driven the growth of DC pension systems in many non-unionized segments of US industry. It is curious that these imperatives have not been as evident in UK industry notwithstanding the greater openness of the UK economy to international competition. Even so, in both countries, a resolution of the DB knot must be found for employers, employees, shareholders and even taxpayers. Consequently, we need alternatives and a means of transition.

**Road Blocks.** A “natural” solution to the DB pension crisis would be contract renegotiation. However, for negotiations to succeed each party needs to be willing to sacrifice, and the level of compromise required to restructure looming pension burdens does not seem readily available in today’s environment. Indeed, in order to achieve a

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<sup>35</sup> DB pensions played an important role in making early retirement possible, particularly for the current generation of retirees – chiefly those that have retired since about 1990.

cost-effective negotiated solution to the crisis, private solutions require informational and bargaining-power symmetry as well as overcoming misaligned interests due to principal-agent problems, a tall order (Ambachtsheer, 2005). The competing interests of legislators, shareholders, M&A merchants, buyout markets, private equity markets, insurance markets, and workers (retired and active) threaten the prospect of negotiations. Sponsors are also responsible; as they appear all too willing to push the liability forward to future generations of managers to deal with and, in the case of US sponsors, use bankruptcy courts as a bailout or as a means of controlling negotiations.

**Collective Breakdown?** One group will require the most convincing: organized labor. Unions' historical role in pension provision demonstrates that their agreement, in particular, is vital to a successful negotiated outcome. The presence of organized labor in post WWII manufacturing industries drove the original widespread implementation of DB pensions (Sass, 2006). Though weakened, unions have retained much of their bargaining power in those industries (if not beyond).<sup>36</sup> As noted above, unionized workers in the US are roughly four to five times as likely to receive DB pension benefits as non-unionized workers.<sup>37</sup> This should not be surprising, since unions tend to use their bargaining power to push wages above market-clearing levels (McDonald and Solow, 1981). It is not our intention to attack unions, as academic research has also shown that unions may increase labor productivity.<sup>38</sup> In any case, dismantling the traditional DB pension schemes will require some sort of union partnership and cooperation.

In the UK, of course, The Pension Regulator has assumed the role of “honest broker” and is heavily involved in creating solutions for both plan sponsors and beneficiaries. This role includes being a “crisis manager” for plan sponsors threatened by default or

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<sup>36</sup> One option for DB plan sponsors with high levels of unionization is to offer employees cash buyouts wherein the management attempts to seduce the employees into giving up their pension claims via generous lump sum settlements, as GM recently attempted. However, this has yet to be proven effective and is also fraught with money management dangers for those blue collar employees who accept the windfall.

<sup>37</sup> Data according to US Bureau of Labor Statistics: see [www.bls.gov](http://www.bls.gov) for details.

<sup>38</sup> This has been debated in academic literature, with many arguing that unions increase productivity while others arguing that unions constrain innovation and lower profitability; see Freeman's (1984) seminal work on these issues, Doucouliagos and Laroche (2002) for a summation of the literature, and Hirsch (2004) for a demonstration of unions' impact on profitability.

insolvency. However, most importantly, The Pension Regulator also acts as “facilitator” of financial market transactions where pension liabilities are a major consideration (see the Marconi and BAA deals). As such, The Regulator is viewed in the marketplace as an engaged third party rather than simply as a constraint on deal making. Finally, The Regulator only guarantees a fraction of the accrued benefit, compared to the PBGC, which means all parties are more willing to make concessions.

#### ***4.2) In Search of a New Model***

In order to make a fresh start and increase the likelihood of achieving successful negotiations, sponsors should be focused on both “cost-cutting” and “risk-cutting” (i.e. risk transfer). Traditional DB pensions will not be available to new employees for much longer without cost reductions. However, for new pension constructs to be sustainable and secure, they will need to distribute the risks inherent to DB pension plans in ways that are neutral with respect to corporate structure. One system often lauded in this context is in the Netherlands. We now turn to the Dutch occupational model for inspiration.

**Sustainable DB.** Jan Nijssen, CEO of ING, recently stated, “The Netherlands may be the country with the highest likelihood of keeping a long-term sustainable defined benefit system.”<sup>39</sup> The Netherlands offers a flexible and transparent mandatory second pillar pension structure that has convinced some of its sustainability. According to the Dutch central bank, pension regulation should be strict enough to safeguard solvency but not so restrictive as to interfere with optimal management policies. Additionally, it believes that overly severe funding rules would compound the trend for pension fund sponsors to reduce guarantees or switch to DC plans (Bikker and Vlaar, 2006).

**Rigid Flexibility.** The Dutch system combines inflexible solvency requirements for guaranteed nominal pension rights with high levels of flexibility for conditional pension rights.

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<sup>39</sup> Statement from IPE Netherlands, February 2006, p. 6

**A) Rigidity.** Dutch pension funds are required to maintain a funding coverage ratio of 105% at all times. Any drop below this level of funding requires resolution in one year. In addition, pensions need to build up a cushion of up to 130%, which varies according to the risk profile of the assets in the portfolio.<sup>40</sup> These are strict requirements that ensure firms will have enough capital to pay at least nominal benefits. This approach to securing the pension benefit can be explained by the fact that the pension regulator PVK (now integrated into the Dutch National Bank) also regulates the insurance industry.

**B) Flexibility.** Pension funds have recourse to three main tools with which they can affect their funding status: contribution policy, indexation policy, and investment strategy.<sup>41</sup> When in unfunded states, funds can require increased contributions, forestall the indexation of benefits and/or change the investment strategy. For conditional pension rights (indexed), funds are not required to reserve extra capital. While indexed benefits are encouraged (and are often provided), only nominal benefits are guaranteed. In addition, benefits are largely based on average wage rather than final salary, reducing funds' exposure to wage inflation risks.

**A New Hope?** The Dutch model could be enlightening for regulators in the UK and the US facing DB pension crisis. Indeed, the flexibilities built into the Dutch DB pension deal give it a DC-like flavor; benefits paid are, in part, a function of contributions and investment returns, thereby reducing the risks on the sponsoring organizations. However, this is likely not the “end-model” to emulate. The dwindling organized labor movements of the UK and US suggests this would be difficult to achieve since social solidarity underpins the whole Dutch pension framework (Reil, De Deken, and Ponds, 2006). Moreover, the nominal guarantee of benefits can still cause problems between stakeholders over how these guarantees should be valued and funded (see section eight: neutrality).

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<sup>40</sup> Based on the FTK legislation, which comes into effect in 2007.

<sup>41</sup> Though some of these policy decisions are made on a yearly basis.



## **5) Framework for Government Intervention**

### ***5.1) Security above Costs***

Outsourcing supplementary pension provision to the private sector, a desired goal of UK and US governments over the past 50 years (witness the significance of tax benefits on employee and employer contributions), needs to be undertaken with due regard to the distribution of costs and risks (Laboul and Yermo, 2006). However, governments' current willingness to eliminate the possibility of default has concentrated with the plan sponsor both the costs and the risks of a DB plan. Interestingly, given the long history of occupational pension provision, the first serious foray into pension funding regulation was only in 1974 – the US Employee Retirement Income Security Act (ERISA). Since that time, numerous regulations restricting pension provision have been passed across the OECD. Thus far, legislation has focused on improving the security of plans and protecting the rights of plan beneficiaries (Laboul and Yermo, 2006).

Once again, we face a political turning point in which governments will be called upon to assist in constructing a “new” private pension agreement. For example, pension reform currently making its way through the US Congress will strengthen funding rules and increase PBGC premiums. The UK Pension Act of 2004, among other things, set up the Pension Protection Fund (PPF) and The Pension Regulator, with the prospect of risk-related insurance premiums. Although the Dutch pension system is on firm ground, the FTK reform package requires fair value analysis for pension liabilities and assets. In addition, global accounting standards are likely to adopt pension valuation standards similar to the UK in order to increase transparency.

The need for DB pension reform must be reconciled with increases in market distortion and sponsor costs, including those associated with tighter funding rules and requirements. For example, increasing insurance premiums by the PPF or PBGC could be enormous impositions on already imperiled firms. Indeed, the countercyclical nature of funding rules already poses a threat to DB sustainability, as companies must fund more in

downturns when they might not be able to afford it. So far, the UK and US seem willing to increase benefit “security” in spite of its constricting financial effects on sponsoring firms, tightening the “knot of contracts” and reinforcing the prospect of a failure of the DB institution.

### ***5.2) Why the Nuclear Option is not Desirable***

For firms facing this “tightening” stalemate, government bailout via bankruptcy in the US and via the PPF in the UK may appear to be the only way to proceed. In fact, the US airline industry provides a good example of this claim: in 2005, Delta, Northwest, United Airlines, and US Airways all filed for Chapter 11 bankruptcy. American Airlines is the only legacy carrier that has not yet resorted to court-ordered restructuring. However, this puts American at a disadvantage, as its competitors are expected to exit Chapter 11 with healthier balance sheets and lower current pension costs. In effect, the current crop of companies emerging from Chapter 11 are in much better financial shape (see, for example, UAL’s profit forecast for 2007).

**Not Desirable.** No firm should have a pension interest in declaring bankruptcy. But those with debilitating DB pension obligations are seemingly left with no other option. This is a difficult and undesirable path. If total liabilities are greater than assets (as is often the case for firms with large unfunded pension liabilities), bankruptcy usually results in bondholders ending-up with shares, shareholders ending up with hardly anything, workers ending up with much lower benefits and wages, and management’s focus being drawn away from core business. The transaction costs are extremely high, and the brinkmanship associated with a bankruptcy proceeding is antithetical to negotiated agreements. There are numerous opportunities for hold-up or hold-out (Williamson, 1979). Finally, the courts will not necessarily do an effective job of restructuring. Indeed, the courts are hardly pension negotiators by training and expertise.<sup>42</sup>

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<sup>42</sup> As noted above, the UK Pension Regulator has demonstrated that the “nuclear option” is not necessarily the only path forward for managing pension liabilities.

## **6) Framework for a Market Solution**

### ***6.1) Wall Street Solutions***

In the absence of a negotiated or government solution, innovative financial products and investment strategies are finding a home within the pension community. The eagerness of plan sponsors to change errant investment strategies of the late 1990's, combined with the prospect of increased balance sheet volatility due to mark-to-market pension accounting, has sparked widespread interest amongst DB pension funds in risk immunization and liability management.

However, pension plans looking for long-term solutions to their pension woes in financial products may be disappointed. DB pension providers face many risks, some hedgeable and some not, all of which pose serious threats to pension health.<sup>43</sup> The “unhedgeables” have thus far been resistant to the financial community’s attempts to mitigate them. There are examples of success, such as the December 2003 Swiss Re mortality catastrophe bond.<sup>44</sup> But such successes are rare and matched with failures.<sup>45</sup> Nevertheless, financial innovation is worth examining, as it will likely be an intermediate stepping stone in the path to a long-term stable solution.

**Successful Innovation.** Pension funds have been drivers of financial innovation for decades, as their asset management strategies have prompted the provision of complex financial products. See, for example, Zvi Bodie (1989): “While the immunization strategies of pension funds have spurred innovation in the fixed income securities markets, pension fund contingent immunization and portfolio insurance strategies have created a market for options and financial futures contracts.” There is no doubt that the

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<sup>43</sup> See Cardinale, et al. (2005) for a detailed analysis.

<sup>44</sup> The bond was constructed with principal that is unprotected and depends on what happens to an index of mortality rates across the United States, United Kingdom, France, Italy and Switzerland. Investors in the bond receive an enhanced return if mortality remains at normal levels. This issue was fully subscribed. For the issuer, life insurance is a primary source of business, accounting for roughly 30% of turnover. Thus, profitability is negatively correlated with mortality rates, making this bond effective at shifting its longevity risk profile (Blake, Cairns and Dowd, 2006).

<sup>45</sup> For instance, a 2004 Longevity bond by EIB and BNP Paribas failed to garner enough interest.

peculiar requirements placed on pension funds have been a driving force for financial innovation since the 1970s (Clowes, 2000).

Financial innovation continues today. For instance, pension funds are increasingly demanding swap and derivative strategies, as pension funds become more sophisticated consumers of investment advice. If implemented properly, swaps can hedge against various risks,<sup>46</sup> such as interest rate changes.<sup>47</sup>

**Financial Limitations.** Financial products also offer trustees and management “stop loss” strategies, risk immunization, decreased balance sheet volatility, and more efficient use of pension capital. With huge demand coming from pension funds, the underlying problem impeding a structured finance solution is supply (see 50-year Gilts and 30-year Treasuries, where yields are far lower than historical levels). Supply of these securities could increase, as governments take advantage of cheap debt. However, if we consider widespread implementation of strategies involving longevity or inflation-linked bonds, finding suitable supply to serve the UK and US DB pension universe seems highly unlikely. Swap contracts may offer more liquidity, but they are expensive. In addition, unfunded plans that implement these strategies are committed to making-up most of their deficit with increased contributions – a displeasing prospect for shareholders.

In addition, despite high costs, these strategies do not eliminate all of the risks for the firm. Some of the “unhedgeables” (mortality risk, inflation risk, etc.) will remain in one form or another, leaving the sponsor vulnerable in the future.<sup>48</sup> Consequently, sponsors allow for the possibility that they will be hampered in some new way in the future (just as few saw 30 years ago the problems DB pensions would cause today).

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<sup>46</sup> See Bodie and Merton (2002) for a fascinating article on pensions and swaps

<sup>47</sup> However, as mentioned by Hindocha on a previous draft, there are limits to the extent of risk diversification in the market. Indeed, as Shiller (2003) points out, the only way to deal with concentrated risk is to have a global marketplace with a greater capacity to spread risk.

<sup>48</sup> However, Credit Suisse has created a life index with which they hope to base financial products. They expect life insurers and pensions to be natural counter parties.

**Bulge Business.** Investment banks stand to gain significantly from the increased trading volume in structured financial products; multibillion-dollar swap deals are particularly lucrative. This trend has not gone unnoticed, as bulge bracket firms beef up their pension supervisory services to offer tailor-made pension solutions, and specialty investment shops, such as Integrated Finance Limited,<sup>49</sup> are created to take advantage of this trend. The development of specialists is welcome, as they will no doubt push financial innovation and raise awareness within the pension universe. However, in order to be a part of the long-term solution to the DB crisis, specialists need to find innovative ways to sidestep capacity constraints and eliminate the “unhedgeables”. Otherwise, any single financial product or strategy, no matter how successful it is on a client-to-client basis, is not a solution to the pension crisis.

## ***6.2) One Time Charge***

Financial instruments can be only partial solutions to the risks posed by DB pension obligations due to unhedgeable risks and capacity limitations (again making pension liabilities different from traditional debt). Therefore, plan sponsors, keen to avoid diverted cash flows and balance sheet volatility, are looking towards the bulk annuity market and insurance companies as a possible solution to their pensions problems.<sup>50</sup> The bulk annuity market is a unique type of outsourcing; companies pay insurers a premium for taking on their pension assets and liabilities and removing the latent DB pension risks from the plan sponsor. However, at present, this costly solution is only available to plans that have reached full funding.

**Risk Takers.** In order for bulk annuities to have widespread appeal, supportive regulation, which eases the capital requirements for firms underwriting the business, and clarifies the legality of the transactions, is required. This should create more liquid markets, as current conditions are unsatisfactory and anti-competitive. For example, the

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<sup>49</sup> A specialist investment bank combining academic pension finance research (Robert Merton and Zvi Bodie) with derivative and investment banking specialists (Peter Hancock and Roberto Mendoza).

<sup>50</sup> The prospect of a bulk buyout market raises contentious legal issues; namely whether the liability can legally be transferred and who is responsible for the liability should the bulk annuity provider fail.

UK Office of Fair Trading investigated the bulk annuity market last year after complaints of unfair pricing.<sup>51</sup> At the time of writing, the UK market for bulk annuities is a duopoly, with Prudential and Legal & General writing almost all of the business. Logically, higher levels of competition amongst bulk annuity providers would lower costs to a more reasonable level. Encouragingly, this appears to be happening, as firms and high profile individuals are considering entering the market, including Aviva, Aegon, Mark Wood, Warren Buffet, Isabel Hudson, Hugh Osmond, Edmund Truell, and numerous investment banks. Indeed, one managing director at a bulge bracket investment bank told us that he has the green light to acquire a pension fund; their only problem is pricing the deal. These players hope to make profits by doing a better job than pension funds at managing the intersection between assets and liabilities.

Though expensive, they are a one-time charge that could eliminate the sponsor's risks. As such, via bulk buyouts, traditional DB pension liabilities could be "sold off" and new, more sustainable plans constructed. These transactions would facilitate institutional solutions we believe important (see conclusions). Ideally, this service would be offered to funded and unfunded plans (via pay down periods over a set number of years).

**A Stepping Stone.** Financial markets have a crucial role to play in resolving the pension crisis. However, this role is not, as was hoped by some, *the* panacea to the pension crisis. Both investment banks and bulk players are seeking to carve out the DB pension risks and take them from the sponsor. This is a key stepping-stone and requires ongoing innovation (and regulatory support), as the transfer of risks will create an opening for change. However, the ultimate solution to the pension crisis is what fills this opening, not what creates it.

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<sup>51</sup> For plan sponsors keen to shed their liabilities, one strategy might be to combine the purchase of a bulk annuity with a purchase of the life insurers shares as the extra profits from the annuity sale would likely feed through into a dividend or appreciation over time.

### ***6.3) Life Long Charge***

Considering no complete integrated solution exists, many DB sponsors feel obliged to ride out their pension troubles. One response is for sponsors to close their plan to new entrants and work the liability off over the long-term. However, closing underfunded plans is not without risks, since the maturity of such plans accelerates without a stream of younger participants. In addition, mature plans typically have greater calls on corporate assets and revenues, due to the funding costs associated with participants as they approach retirement. Accelerating maturity also normally prompts a switch from riskier assets to lower-yielding safe assets. This switch often requires firms to contribute more in order to return plans to funded levels, putting more stress on plan sponsors and the market for fixed income products (Clark, 2006). As such, freezing pensions with the goal of wearing down the liability over the long-term is not an effective solution to the pension crisis; the burden of a mature closed DB pension could outweigh that of an open DB pension (depending on the circumstances of the plan sponsor).<sup>52</sup> Consequently, the decision to close or freeze a plan must be taken in coordination with a well thought out immunization and funding strategy (see conclusions).

### ***6.4) Corporate Control***

Despite the media attention on pension deficits amongst FTSE 100 and S&P 500 DB plan sponsors, hundreds and perhaps thousands of small and medium sized corporations are also being forced to cope with burdensome DB pension liabilities. These firms are in a difficult position, but there is a solution for these smaller plan sponsors unavailable to large firms: traditional mergers & acquisitions.

As indicated earlier, sponsors of maturing DB plans sequentially make themselves less competitive each time they choose current DB contributions over current investment in

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<sup>52</sup> In the UK rail industry, plans closed to new entrants have roughly 4% higher employee contributions than open plans (Taylor, 2006).

the firm. Moreover, since funding rules are tightening and prospective pension deficits significant, the current generation of managers is being *forced* to privilege contributions over investment. As such, for firms with DB pension deficits, corporate competitiveness, particularly on the international stage, could spiral downwards. Although this is an alarming prospect for managers of small firms, selling out may offer firms another “solution” outside of bankruptcy courts.

Indeed, large corporations would have no problem acquiring small DB plan sponsors, so long as the acquirer has a different benefit plan and capital structure from the target. If this is the case, the DB pension obligation could be easily managed as a very small piece of the capital structure of the new larger firm.<sup>53</sup> Moreover, using immunization strategies, the target could minimize its DB pension risks, making itself a relatively attractive target and facilitating more generous pricing of the deal. Such a deal would be welcomed by shareholders and employees, though managers would effectively be selling their jobs. Though an extreme “solution”, some firms will have no other private sector alternatives.

### ***6.5) Perfect Storm III***

Just as interest rates and assets came together in 2001 and 2002 in a perfect storm that sent pension funding levels plummeting, some hope that a partnership of high interest rates and high asset returns could send plans back to fully funded levels, avoiding the costly prospect of achieving full funding with contributions alone. Currently, with short term interest rates rising, and markets showing resilience, deficit levels have been gradually improving from the lows seen between 2003 and 2005. However, before ushering in the inverse perfect storm, one needs to remember how unlikely this outcome is, as asset markets typically react inversely to interest rates; when rates get too high bond and equity markets suffer. Nevertheless, considering the perfect storm I, it is not outside the realm of possibilities and should at least be considered by sponsors in scenario planning – particularly considering that sponsors who are keen to immunize their risk

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<sup>53</sup> This will not work for large DB plan sponsors, since pricing and taking over a large pension liability becomes too much of a burden on the acquirer.



may be holding assets that, though better reflecting their liabilities, do not carry the risk premium necessary to ride a wave of asset growth out of DB pension underfunding.

## **7) Reality Check: Pensions are Expensive**

### ***7.1) Affordability***

Coming to grips with the true cost of retirement is vital to constructing a sustainable pension deal. (See Box II in Appendix for PGGM's innovative Fair Value model.) Simply stated, pensions and retirement are extremely expensive. Moreover, while negotiations offer a mechanism for sharing the risk burden, and financial products offer a way of hedging against some priceable risks, neither are effective at reducing current costs. Indeed, within a traditional DB pension, the benefit remains inflexible and generous, a toxic mix.

**Atlas the Titan.** As of the mid-90s (the most recent data available from the US Bureau of Labor Statistics), in medium and large private establishments, only 3% of employees with DB pensions were required to contribute to their DB pensions.<sup>54</sup> Though this percentage has no doubt risen, given the extent of current underfunding, it nonetheless suggests that firms have had to shoulder a large portion of the increase in pension costs over the past decade.<sup>55</sup> In the UK, DB contributions have increased from 15.8% in 2002 to 22% of earnings in 2005 (Association of Consulting Actuaries Pension Trends Survey 2005).<sup>56</sup> Yet, the percentage paid by the employer has risen more than the portion paid through employee contributions (employers' portion is up by 5% but employees' by just 1.2% since 2002). This demonstrates the over-weighting of cost with the sponsor and the inability to meaningfully change contribution policies to meet the high cost of pensions.

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<sup>54</sup> Data according to US Bureau of Labor Statistics: see [www.bls.gov](http://www.bls.gov) for details.

<sup>55</sup> However, employees could also be paying indirectly to some degree by foregoing increases in their current pay, despite the tax disadvantages of this strategy compared with direct employee contributions.

<sup>56</sup> According to a survey of 392 DB plan sponsors with some £131 billion in assets; see [www.aca.org.uk](http://www.aca.org.uk).

Undeniably, the dearth of viable long-term solutions to the pension crisis stems in part from the inability to reduce the high cost of retirement. With the market returns on the asset pools no longer able to keep up with the generosity of benefits, contribution levels must be set high enough to avoid an unstable plan. As a first step, if DB pensions shared this cost more equitably between workers and plan sponsors in ways that were “neutral” with respect to firm effects, then the system could conceivably function efficiently.

## ***7.2) Contributions before Benefits***

While current negotiations between employers and employees focus heavily on benefit levels, perhaps a near-term “solution” could be a new bargain over the correct contribution rate. Indeed, benefit levels are rendered irrelevant if insufficient cash is set aside for pension funding. Raising employee contributions is one possible step forward in sharing costs. For example, a benefit formula that increased employee contributions when wages go up (as would happen if employees are required to give a percentage of their salary) is an effective partial hedge for the sponsor against wage inflation. Moreover, as we note later on, linking a contribution increase when a pay raise is given is less painful for employees, rather than trying to increase contributions outright (Thaler and Benartzi, 2004). In addition, “cost sharing” contracts that last for five to ten years, in which contribution levels for plan sponsors are fixed, would decrease volatility and increase DB pension sustainability.

**Useful Intervention.** Changing employee contributions is not straightforward. Even if the pension covenant would allow it, a change in contribution levels could breach the employment contract.<sup>57</sup> Such considerations are serious, and they may restrict a firm’s ability to act. In case of negotiation-paralysis, collective welfare may be served if the government were to set contribution guidelines (rather than funding rules) for both employees and employers in a manner that shares costs.<sup>58</sup>

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<sup>57</sup> UK regulations: How to boost contributions to final salary pensions. EIU ViewsWire. New York: May 27, 2003.

<sup>58</sup> On a previous draft, questions were raised over whether this is tantamount to allowing corporations to renege on their promises if plan members do not accept to put more money into funds. We are not arguing

**Outlook.** DB pensions are inherently expensive and, as the first few years of this decade demonstrate, previous attempts to find shortcuts have ended in hardship. Understanding the true cost of pensions is important, and sharing the burden of that cost will be essential for future endeavors.<sup>59</sup> Of course, simply implementing a hike in employee contribution rates does not remove the burden of the DB pension obligation (and the associated risks) from the firm. Nevertheless, understanding how contribution rates impact pension benefits will be necessary for the construction of an institutional solution.

## **8) The Principles for a Sustainable Model**

### ***8.1) A Difficult Path***

Highlighting the principles of sustainability is important, because solutions to the pension crisis are so difficult to find and justify to stakeholders. Below, we have listed five particularly important principles that will need to be incorporated in any viable solutions.

**Pareto Improvement.** The success of any institutional solution or reform relies on maintaining firms' market competitiveness while minimizing harm to employees. However, in evaluating the welfare of the employee, one must examine everything: quality of life, longevity, job security, early retirement, compensation, etc. In this context, if life is longer, and all other variables remain the same, the employee is better off; in contrast, the firm is worse off, as it has to support the employee's extended life without receiving anything in return. In order to achieve a Pareto improvement, the gain in longevity for the employee would have to leave the firm no worse off. As such, increased longevity should be paired with a longer working life or more flexible contributions and benefits. There are tradeoffs to be made in this crisis in order to right the wrongs of the past decades and to achieve a feasible solution to the current dilemma.

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to allow companies to default on promises. We argue that negotiation must be achieved outside of bankruptcy, so as to avoid court-managed distribution of the burden.

<sup>59</sup> DB pensions are deferred pay plus an annuity, which implies that employees may receive more than just deferred compensation.

**Untying the Knot.** All DB sponsors will need to look for ways to “untie the knot” and unravel the contracts. For those firms with high levels of unionization, binding arbitration could be a way of avoiding bankruptcy. In addition, for those firms that can afford it, financial markets offer some effective options, such as bulk buyouts. However, many companies hope that the way forward is a generational one, in which new employees are not offered DB pensions, and the inherited liability of DB schemes is worked off by those employees over the long-term. Yet, letting the liability wind down is a slow process, and may take several decades. For firms facing stiff market competition and demands from shareholders, this may be too long.

**Good Government.** Despite past misjudgments, governments still have a significant role to play in resolving the pension crisis. Without new regulations governing contributions and encouraging the formation of a market for bulk buyouts, private sector solutions may be stymied; the remaining option is a bailout. However, regulation should encourage the provision of plans that are “neutral” with respect to corporate structure and, more importantly, facilitate the transition of traditional DB pensions to something else. In addition, corporate compensation practices have changed as fast as corporate structure, suggesting that room needs to be left for compensation and benefit flexibility. Finally, and perhaps most importantly, because pension provision in the private sector is voluntary, regulations must not confuse the objectives of the firm, which would only result in non-provision (Clark and Hu, 2005).

**Neutrality.** Once traditional private sector DB pensions are gone, firms will need to take their pension design back to their compensation practices. Specifically, firms are increasingly calling for plans that share risk; but for “risk sharing” to move pensions towards sustainability, it must only be a stepping-stone in the path towards “neutrality”. Neutrality means that the pension plan does not impact the core operations of the business in unintended ways, which suggests that the risks, though not the costs, of the pension might have to fall on the employee (see conclusions for more details). Collective risk sharing is highly complex (Ambachtsheer, 2005 and Drucker, 1976). In traditional

DB pensions, the only situation where conflict between stakeholders can be avoided, from a game theory perspective, is when funding is exactly 100%, since outside of this equilibrium each party will attempt to “win” the surplus or “win” the right not to own the deficit (Ambachtsheer, 2002). Thus, if employer sponsored pensions are to remain, “risk sharing” will not be a solution on its own, since each stakeholder will inevitably look to “win”. Consequently, neutrality implies “risk cutting” though not necessarily “cost cutting” for the firm.<sup>60</sup> In any case, the current convoluted risk structure needs to be untangled.

**Innovation.** Widespread institutional change is going to come from innovation, as new pension plan designs will ideally offer firms more sustainable options. For example, hybrid pension schemes are one mechanism of encouraging institutional innovation. Many firms see hybrids as a way to revitalize their DB plan structure. Indeed, hybrids are a better option than continuing with a “renegotiated” traditional DB plan, though this depends on the institutional setup in the country. Hybrids, such as cash balance (CB) plans, are regulated like they are DB, but the assets and liabilities grow as if they are DC, with contributions and a promised return (usually some T-Bill rate). The benefit is then paid as a lump sum, rather than as an annuity (Clark and Schieber, 2004). In terms of advantages, hybrids offer a more even accrual rate than traditional plans. Also, they do not penalize job mobility. Hybrids also allow sponsors to communicate pension value to employees in a way that is very similar to DC, with account values and nominal accruals each year. Another benefit of hybrids is the abolishment of early retirement provisions that are typically part of the overly generous DB pension deal (Coronado and Hewitt, 2005). Hybrids are no doubt an innovative alternative to traditional DB pensions and a feasible institutional solution. On the other hand, some employers see these types of plans as too risky due to some intense political opposition, regulatory uncertainties and litigation concerns.

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<sup>60</sup> For a discussion of how DB pensions impact sponsor see the “key findings and conclusions” from the Rotman International Centre for Pension Management conference on Pension Plan Design, Risk, and Sustainability ([http://www.rotman.utoronto.ca/icpm/Workshop05\\_keyfindings.pdf](http://www.rotman.utoronto.ca/icpm/Workshop05_keyfindings.pdf)).

## **CONCLUSIONS:**

A past generation of managers has made commitments requiring urgent renegotiation in the present in order to avoid institutional failure in the future. This pension crisis is worsened by the fact that government regulations have provided misguided incentives and compounded the problem, neutering the possibility of achieving a private sector solution and making government bailouts a first-order choice. Bearing in mind that there is no “silver bullet” or cost- or risk-free solution to the pension crisis, a road map is still necessary so those firms faced with the burden of a DB pension can understand what is at stake and what choices are available. First, plan sponsors will need to evaluate their own situation in order to determine their final destination, since plan health will ultimately dictate what is available and possible. Nevertheless, we believe four broad reform / restructuring paths can be implemented:

### **Plan A: Removal & Replacement**

Plan A is the most complicated of the four options offered here since the DB plan has to be removed before it can be replaced. Moreover, in order to remove the pension, plan A relies on using solutions that thus far have failed -- the hope would be that negotiations, government intervention and financial and insurance products can be successfully combined and implemented in innovative ways. Nevertheless, each firm must consider their own situation, since the path taken by a well funded plan will differ from that of an underfunded plan. The roadmap below is intended for the underfunded pension plan, which suggests that some steps could be passed over by a healthy DB pension. Though we are aware of the heroic nature of this undertaking, we argue that this is not impossible and is still the best path forward out of the pension crisis. Each of these phases on their own is not an adequate solution, but together they offer a road map to the future:

- 1) Contribute: Plan sponsors should start by re-negotiating contribution levels and/or benefit levels (government involvement will likely be required in this first phase due to the many complications in renegotiating). DB pensions are simply too expensive and generous for the firm to shoulder the entire burden. Changing benefit levels or sharing the

burden of contributions will help put precarious plans on firmer footing, which will be required for their removal. (This should not be seen as a solution in its own right: just as managers 30 years ago could not foresee the burden of the DB plan, it is also risky to leave “renegotiated” traditional DB plans in place.)

2) Immunize: Financial immunization, though incomplete, will be a useful tool for firms looking to transition out of their traditional DB pension. The plan can be partially neutralized (possibly even to longevity risk if financial markets can innovate). Moreover, married with equitable contribution and benefit policies, the plan sponsor will not have to shoulder the burden of returning the plan to full funding alone. Also, this “stop loss” strategy will keep plans from relapsing into underfunded status during transition towards closure.

3) Close: The paradox of closing or freezing a DB pension is that it accelerates the maturity of the plan, which could then precipitate crisis. Consequently, closure of the DB pension needs to be undertaken with protection, which in this case refers to renegotiated contributions and/or benefits coupled with financial immunization.

4) Sell: Once the traditional DB pension is frozen or closed, it will open the door for removing the management of the plan from the sponsor. Currently, the bulk buyout market is the best hope for removal of the plan’s risks. Thanks to the contribution policy changes and the financial immunization, the plan should be in good health. More importantly, this health should allow for a cheaper bulk buyout since competition in the market for closed DB pensions will ideally be fierce (if government legislation that reinforces this is implemented).

5) Replace: Once the DB pension is gone, the replacement is likely a DC type plan.<sup>61</sup> Indeed, it was conceded at our recent conference on DB pension liabilities that DC has the most traction going forward in the private sector. However, as mentioned earlier, traditional DC pensions can cause as many problems for the employee as DB pensions

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<sup>61</sup> This step could be set up earlier in anticipation of freezing, closing or removing the DB pension.

cause for the employer. As such, new DC models are needed, and are being created. Lessons from behavioral economics have helped to increase the effectiveness of DC pensions at preparing workers for their retirement. This can involve auto-enrollment, which has been proven to increase participation from 49% to 89% (Madrian and Shea, 1999). In addition, linking increased contributions with pay raises has proven to be an effective mechanism for increasing the rate of contributions (Thaler and Benartzi, 2004). In addition to behavioral tricks, pooling of assets to reduce transaction costs and consolidation of management could both improve DC efficiency. The DC plan could also be married with a post-retirement mortality pooling plan that might provide some annuity like benefits at low costs.<sup>62</sup> Finally, some are pushing for DC pension models that use an “auto-pilot” mechanism that, among other things, might adjust contributions and investment policies over time, or include a phased purchase of deferred annuities, in order to control for human errors commonly associated with DC plans (Ambachtsheer, 2006). What ever the shape it takes, DC, love it or hate it, is the future of pension provision for those firms that face fierce market competition.

### **Plan B: Incremental Change**

If the above solution is not feasible, then the DB pension should be changed incrementally over time. Hybrid pensions, which legally remain DB, can achieve neutrality with respect to corporate structure and represent a significant improvement vis-à-vis traditional DB pensions from the firm’s perspective (see section seven). Today, roughly 25% of the Fortune 1000 DB sponsors have a hybrid (Coronado and Hewitt, 2005). The success of hybrids also demonstrates why the pension debate need not be polarized between final salary DB and non-contributory DC – there are feasible alternatives that find middle ground.

### **Plan C: Multi-Employer Plans**

Multi-employer pensions offer sponsors unable to implement plans A and B an alternative to doing nothing. For example, in the DC environment, these plans have been quite successful at pooling together smaller plans into regional, industry or even national

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<sup>62</sup> See article by Urwin (2006) on the future of pensions.



plans (see in particular Australia's superannuation scheme and the NAPF's Super Trusts proposal). These multi-employer DC schemes reduce costs due to efficiencies and scale, all the while maintaining a role for the employer in pension provision, an element we feel strongly about. Ideally, this concept could be applied to smaller DB plan sponsors. By gathering DB plans that individually struggle, a redistribution of risks and costs could achieve, though not perfectly, a sustainable pension. Though government intervention may be necessary in this instance, particularly to renegotiate contribution and benefit levels, this sort of a plan could use the Dutch system as the model for reform.

#### **Plan D: Non-Employer Plans.**

As the UK Turner Report proposed, and the UK White Paper on Pensions (May 2006) has recently endorsed, a non-employer national program could be an effective mechanism for preparing people for retirement, so long as it incorporates some of the above innovative DC characteristics. These non-employer options are also gaining traction globally. In addition, Ambachtsheer (2006) has argued that his "auto pilot" plan would also work as a non-employer DC type pensions – one that address human and governance problems typical of employer-sponsored traditional DC schemes. While we agree with the premise of these plans (improving coverage rates and decreasing firm-based risks), we do not see this as a viable solution due to the simple fact that occupational pensions still serve a labor management purpose. Nevertheless, it is worth drawing peoples' attention to the possibility.

**Final thoughts.** The above solutions target neutrality with respect to corporate structure and are not in any way a demonstration of our ambivalence toward employee welfare. To the contrary, in countries where labor is to become a scarce resource due to demographic challenges, in particular Western Europe, the UK and to some extent North America, pensions will be a vital component of labor attraction, management and retention. Thus, as these shortages approach, they reinforce the need for an effective and sustainable pension system for the benefit of all parties.

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### **BOX I: The Current State of Underfunding**

#### ***United States:***

- The shortfall of assets to liabilities for those firms in the S&P 500 with DB pensions rose from roughly 11% in 2004 to 14% in 2005, according to Bear Stearns.
- According to Credit Suisse, at the end of 2005 pension plan funding for the S&P 500 was \$145 billion in deficit. This is a slight improvement on 2004 thanks to robust asset returns (roughly 11%) and \$58 billion dollars in plan sponsor contributions.
- According to Credit Suisse, at the end of 2005, 78 of the S&P 500 firms were less than 70% funded.
- At the end of its fiscal year (9/30/05), the PBGC's liabilities were \$79.2 billion with matching assets of \$56.5 billion -- a deficit of \$22.8 billion. However this deficit would have been worse (\$25.7 billion) had DB plan terminations announced after the fiscal year ended been included.

#### ***United Kingdom:***

- On January 31, 2006, the pension deficit amongst the FTSE 100 firms that sponsor a DB pension was £66 billion, according to Watson Wyatt. This was off of the previous high of £77 billion achieved on January 18 when yields on long-dated bonds were touching historic lows.
- January 2006 represented an increase of £6 billion for deficits. In addition, amongst the same firms, funding levels averaged only 84% in January. The volatility demonstrated above reflects the vulnerability of these firms to FRS 17 accounting calculations and the rationale behind the drive towards assets that better match their liabilities.
- Watson Wyatt indicated that the fluctuations in pension liabilities shown in January were the largest since they began calculating their Pension Deficit Index in June 2002.

### **BOX II: PGGM's Fair Value Model**

PGGM is a Dutch sector pension fund for the health care industry. They are the 2nd largest pension fund in the Netherlands (€70 billion) and have used an innovative value based ALM methodology to create their Fair Value (FV) model, which can value all cash flows: future and contingent. The model relies on binary state-contingent pricing (i.e. up state vs. down state), which means they believe that pension funds value high returns more in an underfunded state (low state) than they would in an overfunded state (up state). This stems from the idea that less value is placed on an additional dollar of wealth if one is already wealthy than if one is poor. Risks are thus a big piece of what PGGM is looking to price in this ALM model.

- ***Scenario 1: Adverse Impacts of Indexation:*** FV can be used to calculate the probability of reaching funding levels in the future. For example, in one scenario in which the funding ratio started at 100%, with 60% of assets in equities and 40% in bonds, the model showed that full indexation combined with the a contribution rate of 20% resulted in a 19.8% probability of falling into underfunded status, a level likely too high for trustees. Moreover, when the model switches from full indexation of benefits to only nominal guarantees, the probability of underfunding falls to 9.7%, a much more reasonable level for trustees considering the starting point is already on the edge of underfunding.
- ***Scenario 2: Stake Holder Value:*** In addition, the FV model affords PGGM the ability to examine how each change in contribution, indexation and investment policy will impact stake holders. The results are fascinating: In one scenario, a fixed contribution rate of 9.9% is shown to be more valuable to stakeholders than having a fluctuating contribution rate that averages 8.7%. This seems illogical since the 8.7% implies that on average the firm would pay less. However, since the variable contribution rate includes a *risk* of very high contributions in difficult years (exactly when a firm would prefer not to pay higher contributions), the stakeholder prefers the more expensive but consistent contribution rate.

PGGM's FV model will help pension funds conceptualize the true costs and risks associated with their pension obligation. This is an innovation that merits widespread implementation.