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Have changes in pension accounting changed pension provision? A review of the evidence

Paraskevi Vicky Kiosse and Ken Peasnell*

Abstract—The present paper reviews the research evidence on the impact of changes in pension accounting methods on pension provision. We show that decisions to freeze, terminate or convert defined benefit (DB) plans have been driven primarily by a desire to limit contributions, though financial reporting has played a part as well. The introduction of accrual accounting requirements for post-retirement health care benefits in the US similar in character to those required for DB pension liabilities appear to have motivated some firms to curtail health care provision. Changes in accounting for DB schemes have affected how firms allocate pension plan assets. We conclude that accounting matters, though perhaps not as much as is sometimes claimed. Increased costs of providing DB pensions, coupled with the greater volatility of employers' cash contributions, have undoubtedly played the major part in the decline of DB schemes.

Keywords: pension provision, accounting standards, pension regulation, portfolio asset composition, post-retirement health care

1. Introduction

There is widespread concern that people are not saving enough for their retirement. Occupational pension schemes are an important mechanism by which retirement saving can be rendered automatic and as such have been encouraged via tax concessions in many countries. Many occupational pensions, in both the UK and elsewhere, have taken the form of defined benefit (DB) final salary plans. However, new regulatory requirements and demographic changes have significantly raised the costs of such schemes. As a result, many UK companies have been closing their DB schemes to new (and sometimes to existing) members and replacing them with less generous defined contribution (DC) plans.[1] Public awareness and concern over the adequacy of retirement saving has never been higher, as illustrated by the words 'pension crisis' being used 1,104 times in UK newspapers in 2005 compared to only 19 times in 1999 (Hillman, 2008: 9).

This paper addresses the issue of whether the switch from DB to DC plans that has occurred in both the UK and the US can be attributable, at least in part, to changes in the rules governing the reporting of DB plans in companies' published financial statements. Pinning down the influence of accounting requirements on pension provision is not straightforward. The cash contributions required of employers to support their DB schemes have increased markedly. This alone might be expected to have played a decisive role in the decline of DB schemes. Indeed, it could be argued that accounting is doing its job properly when it reveals to managers and owners the costs and risks involved in offering DB pensions, and this might reasonably be expected to result in changes in pension provision. Furthermore, there is only a small body of rigorous academic research that directly addresses the relationship between pension accounting rules and pension provision. The results of some studies are only in working paper form and have not yet been subject to academic peer review. For these reasons, our survey of the field covers a variety of sources, both academic and non-academic, and embeds them in a wider discussion of the factors influencing pension provision.

Our review of the research literature reveals that while DB pension provision has undoubtedly declined, there have been many factors other than new accounting requirements that have played a part in this change. Nevertheless, there is clearly a widespread perception that changes in pension ac-

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[1] We use the terms 'scheme', 'plan' and 'fund' interchangeably in this paper to describe the various kinds of employer-sponsored contractual pension arrangements found in practice.

counting standards that result in increased volatility in reported earnings and the incorporation of pension surpluses and deficits on the balance sheet will lead firms either to change pension investment strategy or to close or restrict their DB schemes. The studies that have been undertaken to date of decisions to freeze, terminate or convert DB plans suggest that the desire to limit cash contributions has been the major determinant, though financial reporting has played a part as well. The picture is clearer in the case of post-retirement health care provision in the US where regulatory interventions do not muddy the water. The evidence suggests that the introduction of accrual accounting has led to firms cutting benefits. Research also clearly demonstrates that changes in accounting for DB schemes have affected how firms allocate pension plan assets.

The remainder of the paper is organised as follows. Section 2 briefly outlines some of the main changes that have taken place in pension provision and the key factors that have driven these changes. Section 3 summarises the relevant key issues at stake in pension accounting and then outlines the main features of the responses received by the Accounting Standards Board (ASB) to its various proposals insofar as they bear on possible consequences for pension provision. We review in Section 4 the academic research dealing with why firms have terminated, frozen or converted their DB plans with special reference to the effect that accounting might have had in encouraging or discouraging such changes. Section 5 examines research dealing with the impact of accounting on another form of retirement provision, post-retirement health care. Accounting can affect not only the nature of the benefits offered to employees, but also the way in which pension funds are invested, an issue we address in Section 6. Concluding remarks appear in Section 7.

2. Changes in corporate pension provision

Private-sector pension provision has changed over the years. In 1953 only three million people in Britain were members of private-sector occupational pension schemes, and this had risen to more than eight million by 1967, growth facilitated by increases in marginal tax rates and wage controls that constrained wages but not pension benefits (Pensions Commission, 2005: 122). DB plans accounted for only 23% of all pension funds in 1953; this had risen to 92% in 1979, after which the trend reversed. While DB plans continue to be very important – the majority of employees covered by private-sector schemes are enrolled in DB plans – their importance is declining; a large share of these DB schemes are closed to new members.[2] A similar picture of DB plans continuing to decline in importance relative to DC plans can be found in the US (US Department of Labor, 2007).

Private-sector DB pension schemes are clearly less common than they were. To understand why this happened we need to consider the risks that DB plans pose for employers. These comprise:

1. *Longevity risk:* the risk that employees will, on average, live longer than predicted.
2. *Interest rate risk:* the risk that interest rates will fall and the burden of long-dated liabilities increase accordingly.
3. *Inflation risk:* the risk that final salaries will increase at a rate greater than predicted.
4. *Investment return risk:* the risk that the returns on the employers' contributions to the plan will under-perform.

Employers can mitigate these risks in a variety of ways, including fully funding or overfunding their plans, and by encouraging the trustees to adopt asset portfolio allocation strategies which hedge the liabilities. We address the question of whether accounting standards have affected pension asset allocation decisions later in Section 6.

While the risks DB plans pose for employers are not new, nevertheless the risks have been increased in recent years by regulatory changes in the UK designed to deal with three major risks that DB pensions posed for employees:

1. *Employment risk:* the risk that the employee will lose or change jobs. In some jurisdictions, short-service employees can find themselves in the situation where the accumulated value of their own contributions into the DB plans they have at their various employers exceeds the present value of the pension rights they had accrued (Monks and Minow, 2008: 145).
2. *Inflation risk:* the risk of pension purchasing power being eroded by inflation.
3. *Default risk:* the moral hazard that employers will default on their obligations, either by becoming insolvent or by closing the plan at a later date to existing members at an age when they might be too old to build up equivalent DC pensions.

A number of regulatory changes have been introduced to mitigate these employee risks. In the UK, these include: preservation of the benefits of early leavers (1988); inflation protection (1991); the in-

[2] As at March 2007, 61% of schemes monitored by the Pensions Regulator were closed either to new members or to future accruals, although the proportion of schemes still open to new members was much greater for larger schemes (Pensions Regulator, 2007: 16). See also Government Actuary's Department (2006) and Cebula and Reyes DeBeaman (2004).

troduction of a minimum funding requirement (1997), replaced since 2005 by a risk-based levy pension protection scheme, with an accompanying need to notify the regulator of certain events (such as changes in credit rating, changes of ownership and breaches of loan covenants). Such regulatory impositions have inevitably increased the cost and reduced the attractiveness of DB plans to UK employers, regardless of accounting requirements. Regulatory changes regarding pension provision have occurred in other countries, some of which are similar in scope and effect as those that have taken place in the UK and some of which are different. These factors need to be borne in mind when considering studies about the impact of pension accounting rules on pension provision in different countries. We refer to these, as appropriate, when discussing the evidence in subsequent sections.

At an aggregate level, DC plans undoubtedly are cheaper for employers than DB plans. For example, the employer's contribution in 2005 as a proportion of the employee's salary averaged 16% for DB schemes and only 6.3% for DC schemes (Government Actuary's Department, 2006: 94). However, care needs to be taken in interpreting these figures. Pension arrangements are but one part of an employment package. Employees with DB pensions might have very different bargaining power than those with DC pensions, making simple comparisons between the two forms of pension provision misleading. If the sole objective of a firm in moving from a DB plan to a DC one is to reduce payroll costs, this can be done in a variety of ways that need not entail terminating their DB plans.[3] The simplest way would be to require the employees to make greater contributions, or to reduce pension benefits (e.g. by cutting the accrual rate), or by cutting some other component of the pay package.[4] The major drawback of DB schemes nowadays is that they expose the employer to volatile demands for cash injections.[5] Another drawback of DB schemes that has been raised in various quarters is that recent changes in pension accounting rules have also increased the volatility of pension expense reported in the profit and loss statement.

With this general picture in mind, we turn next to considering the question of how pension accounting has changed and the likely consequences.

3. The accounting changes and the reactions to them

Until comparatively recently, UK companies had a free hand in how they accounted for their DB schemes. No real distinction was drawn between DB and DC plans, both being accounted for essentially on a pay-as-you-go contributions basis. This changed with the introduction of SSAP 24 (ASC, 1988), except that the calculation of DB pension cost continued to be based on actuarial valuation methods that had underpinned the pension funding decisions. These methods allowed considerable discretion in the calculation of pension asset values and liabilities. Assets were traditionally valued by actuaries using a variety of prospective-yield methods designed to iron out variations in market prices. Liabilities were measured using a rate that reflected the fund's asset allocation strategy – the more it invested in higher-yielding (and hence more risky) assets, the higher the rate used to discount the liabilities. In essence, SSAP 24 allowed for an accrual method of determining pension expense that smoothed out pension surpluses and deficits. In contrast, by requiring pension assets to be measured at market value and pension liabilities to be discounted using the yield on AA-rated corporate bonds, FRS 17 (ASB, 2000) exposed to public gaze the extent to which the employer had surpluses or deficits in its DB plans. While companies were required as from 2001 to make disclosures in the notes to their financial statements, full implementation of FRS 17 was postponed until 2005 so as not to burden them with a change before the switch to International Financial Reporting Standards (IFRS) required in that year. Since that date, UK firms have had to recognise their pension plan surpluses or deficits as an asset or liability on their balance sheets and to record any actuarial gains and losses in the statement of total recognised gains and losses.

What was the expected effect of these changes when they were introduced? To answer this question, we provide a brief summary below of the analysis we have carried out of relevant aspects of the responses received by the ASB to three sets of proposals it has issued at different times on pension accounting. This evidence has to be treated with caution as individuals and organisations make

[3] Insights into why DB plans have become more costly than DC plans can be gleaned by considering the effect of an announced increase in life expectancy of employees and pensioners. In the case of DC plans, the cost would be borne by the employees and pensioners unless the employer increases its contributions. In the case of DB plans, because the accrual rate of pension benefits is usually defined by a pre-specified formula, the cost would be borne by the employer, unless either the accrual rate or any contributions required of the employees were changed.

[4] It is worth noting in this regard that employees enrolled in DB schemes, on average, do make larger proportionate contributions than do those in DC schemes – 4.4% versus 2.7% (Government Actuary's Department, 2006: 94).

[5] For example, the Pensions Regulator (2007: 70) certified £9bn of special contributions to reduce deficits in 2007. In the US, aggregate employer contributions increased from an average of about $30bn per year between 1980 and 2000 to $45bn in 2001 and to $100bn in 2002 and 2003 (Buessing and Soto, 2006).

such submissions with a view to influencing the development of standards and as such the sample inevitably suffers from selection bias.

The ASB received 137 letters in response to FRED 20 (ASB, 1999), its proposed replacement for SSAP 24. This response rate is far greater than is usual for exposure drafts, reflecting the far-reaching nature of the proposed changes (notably, to switch from an actuarial to a market basis for valuing assets and to include pension surpluses and deficits on the balance sheet). Many respondents expressed the fear that the proposals might lead to the demise of DB plans. This concern was widely shared across groups, including specialists in the pension's field (e.g. Institute and Faculty of Actuaries, National Association of Pension Funds, Pensions Management Institute, and various actuarial consulting firms) and accountants (e.g. Institute of Chartered Accountants of Scotland and Midlands Group of Finance Directors). The primary reason cited was that the proposals would increase the volatility of pension costs that would be reported in the profit and loss statement and result in large fluctuations in pension surpluses and deficits included on the balance sheet. Some respondents speculated that companies might alter their pension investment strategies to counter this increased volatility. Others thought that the practice of enhancing scheme benefits (especially in respect of past service) might be jeopardised if companies were required to recognise the costs immediately rather than spreading them out over a longer period.

Some respondents explained why they thought these changes to financial reporting would have such major effects on corporate behaviour. In some cases the underlying unarticulated fear appears to be that the volatility FRED 20 would introduce into financial statements would have detrimental effects on share prices. This assumes, of course, that the market was not already taking into account companies' pension exposures. There is a considerable body of US research indicating that share prices reflect firms' off-balance sheet pension surpluses and deficits and that the market's assessment of equity risk does reflect the risk of the firm's pension plans (Landsman, 1986; Jin et al., 2006). On the other hand, Franzoni and Marin (2006) present evidence of the market significantly over-valuing firms with severely underfunded pension plans, suggesting that while investors took some account of pension exposures afforded by SFAS 87 (FASB, 1985a) disclosures, they did not fully incorporate into prices the negative impact of a large pension deficit on future earnings and cash flows. It is hard to oppose changes to accounting requirements if they are likely to lead to better informed investors, even if pension provision is affected as a result. Indeed, some respondents expressed exactly this sentiment.

Some respondents were concerned that the changes might constrain firms' actions and this might lead them to abandon their DB schemes. For example, the Confederation of British Industry voiced the concern that the inclusion of pension deficits on the balance sheet might limit their ability to pay dividends. This is a situation where accounting numbers serve to constrain managerial actions, in addition to providing information for investors. It could be argued that, if it is the case that changes in pension accounting would restrict the payment of dividends in an unintended and harmful manner, the best solution would be to amend the provisions of the company law governing distributions.

The response to the ASB's proposed amendment to FRS 17 and associated proposed disclosures (ASB, 2006) was much more muted.[6] Of the 44 letters received, only one raised any questions about the likely effect on pension provision. Legal & General expressed the view that any requirement to disclose the buyout cost of DB schemes would '… inevitably have a negative impact on market perceptions of the employing companies, leading to a further reduction in the appeal of defined benefit schemes for employers' on the ground that the buyout cost would typically exceed the FRS 17 liability. Though they outline why they think the buyout cost is misleading, they treat it as self-evident that its disclosure would confuse investors.

As part of the long-term review of pension accounting being carried out by the International Accounting Standards Board (IASB) and the Financial Accounting Standards Board (FASB) the ASB in conjunction with the European Financial Reporting Advisory Group (EFRAG) issued a new discussion paper on the subject (ASB, 2008) which attracted 100 comment letters. Two suggestions in the paper particularly concerned correspondents:

- Replacement of the AA-rated corporate bond yield with a risk-free rate to value pension liabilities. Respondents worried that the resultant increase in reported pension liabilities would increase the incidence of deficits and this might drive firms to invest in government bonds with attendant increases in costs of pension provision.
- Use of the actual rate of return in place of the expected rate of return in the measurement of the return on plan assets in the profit and loss state-

[6] The proposed amendments were that FRS 17 disclosure requirements should be replaced with those of IAS 19 and that the buyout value of scheme liabilities should also be disclosed.

ment. The resultant increase in earnings volatility would encourage firms to close their DB plans.

A number of respondents commented negatively on the recommendation in the discussion paper that normal consolidation principles be applied such that pension assets and liabilities should be included in the employer's balance sheet on a 'gross' rather than 'net' basis. It has been estimated by Shivdasani and Stefanescu (2008) that leverage ratios for firms with pension plans would be about 35% higher in the US if pension assets and liabilities are treated in this manner.

Our reading of the 281 comment letters submitted to the ASB on pension accounting suggests there is widespread concern that the changes in pension accounting will cause firms to make suboptimal pension provision decisions driven by short-term reporting considerations. We return to this issue in Section 7.

Concerns over changes in pension accounting requirements have not been restricted to the UK. Of particular importance has been the debate surrounding the move in the US from SFAS 87 (FASB, 1985a) to SFAS 158 (FASB, 2006) which led to the elimination of the 'corridor method' and the recognition of the funded status of the pension plan on the balance sheet. The corridor method provides a means of smoothing the impact of actuarial gains and losses on reported income.[7] Under SFAS 158, such gains and losses are recognised immediately in other comprehensive income. As SFAS 158 also requires the recognition of (the net difference between) pension assets and liabilities on the balance sheet, pension accounting has become embroiled in the debate over whether fair value accounting has contributed towards the credit crunch (Moody's Investor Service, 2008; Plantin et al., 2008).

4. The impact of accounting on DB pension provision

No rigorous study has yet been carried out to determine whether the introduction of FRS 17 caused firms to terminate their DB plans. One study that does touch on the issue is Klumpes et al. (2007), which uses the pension footnote disclosures required under FRS 17 to identify 40 companies that switched actuarial valuation methods to ones that are similar to those required under FRS 17. This sample was then matched by industry on a pairwise basis with 40 non-switching firms. Klumpes et al. report that 33 of the 80 firms terminated their plans and 47 did not. They found that termination was more likely, the less well funded the pension liabilities and the bigger the value of the put option, to default on those liabilities. In other words, the financial condition of a DB plan plays an important part in whether or not it will be terminated. Klumpes et al. also found that firms that had switched to FRS 17-like actuarial methods were less likely to terminate their DB plans, a result they attribute to such firms tending to sponsor better-funded schemes from a conservative, long-run actuarial perspective.

A number of studies have been carried out in the US into the factors that are likely to have influenced decisions to terminate or freeze DB pension plans in order to remove excess assets from overfunded pension plans.[8,9] This can be done in two ways: all at once, by terminating the plan; or slowly over time, by changing the actuarial assumptions that underpin the contributions required by the Pension Benefit Guarantee Corporation. Terminations are not costless. They have often been bitterly contested by employee groups. Terminations can damage a firm's reputation if they are seen as violating an implicit agreement to provide a pension based on final salary that will include cost-of-living adjustments after retirement financed from the excess assets.[10] Mittelstaedt (1989) and Thomas (1989) focused on plan terminations during the first half of the 1980s, a time (prior to the introduction of SFAS 87) when the accounting rules discouraged rather than encouraged

[7] It should be noted that the corridor method, at the time of writing, is still required under international GAAP in IAS 19 (IASB, 2004).

[8] Our review of the literature on termination of overfunded DB plans is restricted to those which have a direct bearing on pension accounting. Other studies have considered other factors behind these decisions. The general focus of these studies has been to identify settings where the plans have been terminated in order to transfer wealth from employees and pensioners to shareholders or to senior managers (Pontiff et al., 1990; Petersen, 1992; Hamdallah and Ruland, 1986; VanDerhei, 1987; Mittelstaedt and Regier, 1990; Mitchell and Mulherin, 1989) or because of financing constraints (Stone, 1987, 1991) or to minimise tax (Clinch and Shibano, 1996). We exclude such studies from further consideration because they do not address the issue of whether pension accounting rules stimulated or constrained such termination decisions.

[9] There are important institutional similarities and differences between the ways in which private sector pension provision in the US and UK are regulated. A proper documentation of these similarities and differences is beyond the scope of the present paper. We refer at various places to some of the most important developments. For further details, see Fore (2004), Sullivan (2004), McGill et al. (2005), Gordon (2005), Walker and Haberman (2005), Byrne et al. (2006), Gordon and Gallery (2008) and Klumpes and Tang (2007). See Barr and Diamond (2008) for a general overview of pension systems in different countries.

[10] It should be noted that the treatment of cost-of-living adjustments in pension schemes differs between the US and the UK. As we already noted, in the UK, indexation is a legal requirement introduced in 1991. In the US, it represents an implicit contract between the employer and the plan beneficiaries. Bodie (1990: 27) points out: 'The failure of pension funds [in the US] to show any significant interest in inflation-protected investment products such as CPI-linked bonds is clear evidence that they do not view their liabilities as indexed for inflation.'

plan terminations by either requiring the gain be amortised over at least ten years or be classified as extraordinary income, depending on the circumstances (Thomas, 1989: 375).[11] The research designs differed, but both studies identify cash needs as the primary determinant of termination decisions. These cash needs arose from either a weakening of financial performance or financial restructuring following a hostile takeover.

Closure of overfunded pension plans can readily be explained by firms seeking to secure their property rights to excess assets. Likewise, termination of underfunded schemes can be explained by firms seeking to reduce their pension liabilities. These incentives would exist, regardless of how pensions are dealt with in financial statements. Indeed, one can go further: plan terminations should be wealth-neutral, if the actions were simply driven by a desire to meet a financial reporting objective with no contracting consequences. However, there is evidence that plan terminations have real wealth effects. Haw et al. (1988) show that there is a positive stock market reaction at the time of the termination announcement, driven principally by firms terminating overfunded plans tending to have tax loss carry-forwards that can be exploited by the termination.[12] Hsieh at al. (1990) provide evidence of abnormal returns when the terminating firms are experiencing financial distress. These are powerful reasons for terminating plans that owe little or nothing to how the accounting is done.[13]

Nevertheless, there is some evidence that the way pension expense was measured under SFAS 87 might have played a part in DB plan terminations that took the form of conversions to 'cash balance' (CB) plans (D'Souza et al., 2008). A CB plan is technically a DB plan with certain characteristics common to a DC plan. The Bank of America introduced one of the first CB plans in 1985, claiming that it saved them $75m in a single year (D'Souza et al., 2008: 5). Conversions to CB plans became controversial, leading to congressional hearings on the subject in 1999 and again in 2003. Under a CB plan, the employer makes a contribution to an account held for each employee and interest is added each year on the balance of the account. Although a CB plan might appear to be similar to a DC plan, in that longevity risk is transferred from the employer to the employee, it differs in that the investment risk continues to be borne by the employer (Elliott and Moore, 2000). An attraction of a CB plan to an employer is that it provides a means of making an interest rate arbitrage gain by investing the plan's funds in assets that yield higher rates than the bond rate credited to the employee's cash balance account (D'Souza et al., 2008: 5). Furthermore, a CB plan would be classified as a DB plan under SFAS 87, and as such these arbitrage gains would boost reported income, particularly for overfunded plans during the boom conditions of the late 1990s.[14] D'Souza et al. compared firms which converted their DB plans to CB plans during the years 1985–2002 with control samples of firms which terminated their DB plans and firms which continued their DB plans. The study reveals that cost reduction is an important determinant of conversion. The results also indicate that CB conversions were more popular than DB plan terminations among firms with overfunded plans in periods when expected return on plan assets is likely to be high, with a consequent positive effect on reported income.

Beaudoin et al. (2007) examine decisions by large (S&P 500) firms in the period 2001–2006 to stop accruing DB benefits for some or all employees (i.e. to 'freeze' their DB plans). In this period, pension accounting measurement was still governed by SFAS 87. Beaudoin et al. find that the more underfunded the plans and the greater the reported pension expense, the more likely the firm is to freeze the plans. The authors interpret this result as implying that financial reporting considerations played a primary role in the freeze decision, the correlation with pension expense being a consequence of a desire to improve reported performance and funding status in anticipation of the reporting that would soon be required under SFAS 158 (FASB, 2006). An alternative explanation would be that the firms were simply seeking to limit pension contributions, a motive independent of financial reporting rules.

It is important to recognise that the decision to terminate a pension plan depends strongly on the regulatory environment. While companies might be troubled by the magnitude of the liabilities they now have to include on their balance sheets, they will also be mindful of the costs of getting rid of them. Since 2003, a UK company that wishes to 'walk away' from its DB scheme has to get them bought out by an insurance company, who will often price the liability at a much higher figure

[11] These rules were superseded by SFAS 88 (FASB, 1985b), which required immediate recognition of termination gains. However, at more or less the same time plan terminations were made more costly as the *Tax Reform Act 1986* imposed excise taxes of 10% on asset reversions.

[12] To the extent that the determination of tax liabilities is affected by financial accounting measurement standards, the financial reporting will have real economic consequences.

[13] Haw et al. (1991) show that where settlements of overfunded plans do not involve asset reversions, the objective appears to be to offset a decline in earnings and to mitigate debt covenant constraints, suggesting that accounting considerations might have played a role.

[14] Moreover, under SFAS 87 the return on plan assets included in the calculation of reported pension expense is based on the expected rather than the actual return; hence fluctuations in the returns continue to be smoothed with CB plans as they are with DB plans.

than the FRS 17 amount. The actuarial consultants Lane Clarke & Peacock (2006) estimate that if all the FTSE 100 companies chose to do this then the aggregate shortfall as at mid-July 2005 would have exceeded £175bn. Firms in the UK are therefore more likely to seek to freeze DB plans than to close them.

The rules, regulations and conventions governing pension provision are complex and vary from country to country. This has caused considerable difficulty in the development of a universally applicable international standard. Existing pension standards draw a sharp distinction between DB and DC plans. This has caused particular problems in The Netherlands where industry-wide multi-employer DB schemes are commonplace. Prior to IAS 19, Dutch GAAP allowed companies to treat these schemes as DC plans on the ground that the agreement the employers have with the pension fund is that individual companies are not responsible for covering funding shortages, although employer contributions may be increased when such a shortage occurs. Under IAS 19 such schemes would be required to be treated as DB plans. A recent development has been the introduction of a new type of collective pension arrangement that removes the ambiguity concerning the employers' collective responsibility for any shortfalls. Participating companies will continue to offer a DB scheme to their employees, but in the event of a deficit the fund's board will have to decide how the benefits are to be reduced, thereby making the schemes sufficiently DC-like to qualify for DC accounting. Swinkels (2006) reports that some Dutch companies have explicitly attributed the change to the need to comply with the provisions of IAS 19.

In summary, the role accounting plays in pension provision decisions is complex and situation specific. The decision to terminate, freeze or convert DB plans to some other kind of plan is influenced by numerous factors. It could be argued that SFAS 87 encouraged the retention of DB plans by smoothing the impact of period-to-period pension asset returns on reported net income. The conversion of DB plans to CB plans is consistent with this proposition in that CB plans retain the reporting of asset returns by using the expected rather than the actual return. The accounting for both DB and CB plans under SFAS 87 allows sponsoring firms to have their cake and eat it: by investing pension funds in risky assets that promise an expected rate of return greater than the bond rate used to discount pension liabilities, the firm is able to book an interest rate arbitrage without having income affected by the volatility that this strategy entails. This benefit disappears under SFAS 158 in the sense that the volatility is recorded in other comprehensive income.

The evidence we have summarised above suggests that the desire to contain costs has been a more important determinant of pension provision than financial reporting considerations, though that played a part as well.

5. Post-retirement health care benefits

The fact that DB schemes are highly regulated makes it inherently difficult to pin down the effects of accounting requirements on pension provision. A clearer picture emerges if we look at a related form of retirement provision for employees that has also caused problems in the US – employer-sponsored retiree health care plans.

More than 50% of Americans receive their health care insurance through an employer. Costs of employer-paid insurance have been rising rapidly, much more than wages have increased (Kaiser Family Foundation, 2007). While in the case of retiree health plans the commitments extend far into the future, most firms have not pre-funded these obligations due to lack of tax incentives and legal requirements to do so. Prior to the introduction of SFAS 106 (FASB, 1990), the great majority of firms accounted for the costs of retiree health plans on a pay-as-you-go basis (Warshawsky, 1992). SFAS 106 required firms to account for retiree health care obligations on broadly the same accrual accounting basis as they were required to do so for DB pensions under SFAS 87.

SFAS 106 allowed firms to recognise the existing unfunded health care liability immediately on the balance sheet or to spread the recognition over a period not exceeding 20 years (in which case the total liability would have to be disclosed in the notes to the financial statements). Warshawsky et al. (1993) estimate that the unfunded liability, however disclosed, amounted to approximately 6% of the market value of the median firm's equity. Reported income in the years immediately after adoption declined about 5% for firms that recognised the transition liability in full and approximately 8% for those which delayed recognition (Warshawsky et al., 1993).

The introduction of SFAS 106 provided a setting that is largely uncontaminated by regulatory factors or by tax or other cash flow effects. One way in which SFAS 106 might have had an impact is in making managers and investors more aware of the burden of retiree health care commitments. Another is that the resultant increase in a firm's liabilities might impose debt-contracting costs through causing its debt ratio to worsen, thereby increasing the probability of technical default of its borrowing agreements. Such factors might be expected to lead firms to take steps to reduce retiree health care benefits.

Mittelstaedt et al. (1995) examine the possible influences of SFAS 106 with a sample of 202 listed US firms that had reported pay-as-you-go post-

retirement healthcare costs in 1988 as required under SFAS 81 (FASB, 1984), which were not in the utilities and finance industries, and for which necessary data were available. Seventy-one firms in this sample reported reducing benefits and 131 did not. Reductions in benefits took a variety of forms, including capping employer contributions, increasing employee contributions, and reducing or eliminating benefits for certain classes of existing and new employees. As might be expected, firms that were already highly indebted at the time of the introduction of SFAS 106 or had weaker operating cash flow were more inclined to cut benefits than financially stronger firms. After controlling for these factors, Mittelstaedt et al. found that the bigger the impact of the SFAS 106 liability on the debt ratio than would have otherwise been reported, the greater the likelihood that the firm would cut retiree health care benefits.

Generally speaking, any accounting standard that increases reported expenses will tend to result in managerial actions designed either to reduce the costs or to make accrual assumptions that give the appearance of doing so. Mittelstaedt et al. (1995) examine how SFAS 106 encouraged cost-reducing behaviour. Rate-regulated utilities provide an interesting exception to this general rule, for expense-increasing standards can have a positive effect on their cash flows to the extent that the rates they charge are based on their accounting numbers.[15]

D'Souza (1998) examines whether the introduction of SFAS 106 had this effect on electric utility firms. Her study examines 58 US electric utility companies that operated in states where rate recovery of accrued SFAS 106 costs was permitted and for which the necessary data were publicly available. Exactly half of the sample firms cut benefits in some way. An interesting feature of D'Souza's study is that she simultaneously considers both the firms' reporting strategy and whether benefits were cut in the wake of SFAS 106. She finds that 'competitively weaker utilities (high-cost producers with a more price-sensitive customer base) use more cost-inflating SFAS 106 assumptions, and show a greater propensity to refrain from retiree health plan reductions' (D'Souza, 1998: 389). However, her results do not indicate that the decision to cut benefits is influenced by the accounting impact of SFAS 106. As might be expected, utilities where unions have more bargaining power were less likely to modify their health care plans.

These findings are broadly consistent with evidence of how the stock market reacted to the exposure draft for SFAS 106. There was generally a substantial negative stock price reaction, which Espahbodi et al. (1991) attribute to the likely negative effect of SFAS 106 on reported debt ratios. Khurana and Loudder (1994), on the other hand, show that this did not apply to rate-regulated utilities. For these firms, the share price reaction to the exposure draft varied, depending on the market's expectations of whether the regulators would adopt SFAS 106 for rate-setting purposes.

To summarise, we can glean clearer insights into the impact of accounting requirements in the case of post-retirement health care benefits than we can with DB pensions because the influence of other factors can be more readily pinned down. Furthermore, this picture is not complicated by funding considerations because health care benefits are almost always wholly unfunded. SFAS 106 had some effect, largely through the increase in debt ratios. We therefore turn next to consider whether changes in pension accounting rules have affected pension asset allocations.

6. Pension asset allocations

British pension funds invest approximately 60% of their assets in equities (Pensions Regulator, 2007: 19).[16] Sponsoring employers benefited greatly from the long bull market in the 1990s as a direct consequence of following this strategy. Caution would indicate that such firms ought to have chosen to overfund their schemes on the principle that what goes up might later come down. However, the surplus on the winding-up of a DB plan may, in certain circumstances, be returned to the employer, subject to tax at 35%. For this and other reasons, the reaction of many British companies was dramatically to reduce, and in some cases cease altogether, their contributions to their DB schemes. All this took place during the time when SSAP 24 was in force. As a result, for a considerable period of time, DB plans appeared relatively cheap for employers. All the greater was the shock when deficits appeared and contribution rates had to be increased.

We noted in Section 3 the concern that the requirement in FRS 17 to discount pension liabilities using an AA-bond rate might lead firms to tilt pension fund asset allocations strongly in favour of fixed interest securities, regardless of whether this is an optimal economic policy. Indeed, a number of major UK companies have, for whatever reason, done just this. Perhaps the most striking example of this was the decision of the retailer Boots plc in 2001 to move all the assets in its DB scheme, three-quarters of which had previously been invested in equities, into bonds. Overall, there has been a general tendency to disinvest from equities. Nevertheless, firms' pension asset portfolios remain highly sensitive to market conditions. Some indication of this can be obtained by the gyrations

[15] Utilities were excluded from Mittelstaedt et al. (1995) for this very reason.

[16] The proportion is less in larger and better-funded schemes.

in the aggregate FTSE 100 pension deficits and surpluses in recent years. Lane Clark & Peacock (2008) calculate that these have varied from a high of a £12bn surplus in mid-July 2007 to a deficit of £41bn at the same point in 2008.

A substantial amount of research exists on the influence of factors such as employee demographics, tax, regulation and corporate financial policy on pension asset allocations. The amount of research dealing with the possible influence of accounting on pension asset allocation is much more limited. Amir and Benartzi (1999) address the question of whether the recognition of additional minimum pension liability on the balance sheets of US companies in accordance with SFAS 87 influenced asset allocations. SFAS 87 required the disclosure of pension assets and liabilities in footnotes to the financial statements. In addition, any deficit over and beyond that already accrued had to be recognised as 'additional minimum pension liability'. In other words, recognition was asymmetrical, deficits appearing on the balance sheet and surpluses revealed only in footnotes.[17] The likelihood of a firm with a fully funded plan having to recognise a deficit depends on the extent to which the pension assets hedge the pension liabilities. Using a proprietary mark-to-market database, Amir and Benartzi (1999) find that companies which are close to the recognition threshold are more likely to invest in fixed-income securities than in equities.[18] Their results also suggest that firms' choice of pension investments appears to be motivated by a desire to reduce the volatility of pension contributions. In other words, both financial management and financial reporting factors appear to have played a part in US pension asset allocations.

A new study by Amir et al. (2007) turns the spotlight on the UK, examining whether new pension disclosures and pension recognition rules specified in FRS 17 and IAS 19 affected pension asset allocations of British companies. FRS 17 revealed the degree of volatility in firms' DB plans, with surpluses being disclosed in one year only to turn into deficits in the following year, and vice versa. Prior to 2005, firms had the option of just revealing this information in the notes to the financial statements; afterwards, they had to recognise the amounts in the balance sheet and book any gains and losses immediately in the statement of total recognised gains and losses. Amir et al. (2007) label the former the 'disclosure period' (from fiscal 2000 to one year prior to recognition under FRS 17 or IAS 19) and the latter the 'full recognition period'. Shifts in pension portfolio composition could, of course, take place for reasons unconnected with pension accounting. An interesting feature of the Amir et al. (2007) study is that it attempts to control for such differences by comparing shifts in the UK and the US during these two periods. In the US there was a 'partial recognition period' running from fiscal 2000 to November 2006 and a full recognition period from one year prior to adoption of SFAS 158 until the year of adoption in fiscal 2006. The logic of comparing the two countries is that US firms have been required to provide footnote disclosure of pension asset and liability amounts under SFAS 87 since 1986, and are therefore less likely to be motivated to make portfolio adjustments by accounting considerations during these periods than are their British counterparts.

Amir et al. (2007) find that UK companies did indeed shift pension assets from equities to bonds during the disclosure period, whereas US companies maintained a relatively stable allocation of equities and bonds. British companies also shifted from equities to bonds during the full recognition period, and the shift was more pronounced for firms where the negative impact of full recognition was expected to be stronger. US companies also shifted funds from equities to bonds during the SFAS 158 full recognition period, although the shifts were smaller than those made by their British counterparts.

Mashruwala (2007) also finds that the introduction of FRS 17 was associated with a switch of pension assets from equities to bonds. This study found that the magnitude of the switch depended on the likely financial reporting effects of FRS 17. The switch to bonds was greater in firms where the effect of FRS 17 would be to increase reported gearing and greater in firms facing higher expected volatility of future actuarial gains and losses. A constraining factor is that pension asset returns can be 'managed' via the expected return accrual used in the computation of FRS 17 pension expense, a flexibility that is diminished the greater the proportion of pension assets that are invested in bonds. Consistent with this earnings management hypothesis, Mashruwala (2007) finds that firms for which the effect of FRS 17 on reported pension expense is greatest do not reduce their equity allocation.

Germany provides an interesting setting for con-

[17] This asymmetry could be rationalised on economic grounds if the firm's obligations are firm but its rights to pension surpluses are restricted. As noted previously, pension surpluses in the US have often been used by the firm to pay for cost-of-living adjustments to its pensioners. And indeed there have been bitter disputes with unions over attempts by firms to claw back pension surpluses. However, the legal right of the employer to such surpluses was established by a regulatory decision in 1984 if certain stringent conditions were met (Thomas, 1989: 365). Landsman (1986) shows that share prices behave as if pension assets and liabilities are effectively assets and liabilities of the firm, a finding consistent with investors viewing both pension surpluses and deficits as being part of the firm's net assets.

[18] For a critical assessment of this interpretation of the results, see Lilien (1999).

sidering how pension accounting can affect pension allocations. Traditionally, DB plans in Germany are unfunded, taking the form of corporate promises that are backed by a public pension benefit guarantee association in the event of corporate bankruptcy which is funded by annual insurance fees paid by the sponsoring companies. German companies have not faced pressures or incentives to fund their DB plans: there are no regulations requiring that they be funded and any payments into a fund are not tax deductible.[19] Lobe and Stadler (2008) show how this has been affected by the growing number of German companies which since 1998 have been voluntarily preparing their consolidated financial statements in accordance with either international or US accounting standards rather than German GAAP prior to this becoming mandatory in 2005. An unfunded DB pension obligation computed under German GAAP would have been significantly lower than it would have been under IAS 19, SFAS 87 or SFAS 158. However, while it was uncommon for firms to create an external fund of pension assets, if they did so they were generally required under German GAAP to include the pension assets and liabilities separately on a gross basis on the balance sheet, rather than net them off against each other.[20] Adoption of either international or US GAAP therefore had two offsetting effects: on the one hand, their reported pension obligations were increased and, on the other hand, these were reduced if they had pension assets which could be netted against this amount. Lobe and Stadler (2008) outline the various ways that German companies now fund their pension obligations so as to permit them to exploit this netting-off opportunity. They also show that the likelihood of a firm choosing to fund their pension obligations is greater, the more years it has used international pension accounting standards instead of German GAAP.

In summary, research carried out to date supports the proposition that pension accounting requirements have affected pension asset allocations. Whether this has been a good or bad thing is difficult to judge. Concern that has been expressed about shifts in asset allocation from equities to bonds implicitly assumes that pension schemes should optimally allocate a substantial proportion of their funds to equities. The counterview is that investing in equities is only optimal for overfunded schemes (Bodie, 1990). The issue remains an open one.

[19] For a detailed discussion of the various historical, legal and fiscal influences on patterns of pension provision in different countries, see Davis (1995).

[20] As we have already noted, the ASB/EFRAG discussion paper (ASB, 2008) raises the question of whether pension assets and liabilities should be recognised on a gross rather than net basis.

7. Concluding remarks

DB pensions are complex contractual arrangements and determining accounting measurements that will properly inform investors of their economic implications is far from straightforward. Early efforts in this direction allowed firms to follow traditional actuarial practice of 'taking a long view' by smoothing out the underlying volatility of pension returns and costs. This changed with the introduction of FRS 17. The fear has been expressed that this and any subsequent changes in pension accounting will result in employers either cutting back on DB pension provision or drive them to adopt sub-optimal pension asset allocation strategies.

Our review of the research literature reveals the following:

1. Decisions to freeze, terminate or convert DB plans have been driven primarily by a desire to limit contributions, though financial reporting has played a part as well.
2. The introduction of accrual accounting requirements for post-retirement health care benefits in the US similar in character to those required for DB pension liabilities would appear to have motivated some firms to curtail health care provision.
3. Changes in accounting for DB schemes have affected how firms allocate pension plan assets.

We conclude that accounting matters, though perhaps not as much as is sometimes claimed. Increased costs of providing DB pensions caused by increases in life expectancy, the withdrawal of pension funds' tax credit on dividend income and tighter prudential regulations, coupled with the greater volatility of employers' cash contributions, have undoubtedly played the major part in the decline of DB schemes.

A recurring theme of many criticisms made of the new pension standards is that figures are being included in the financial statements that convey little useful information about the long-term costs of providing DB pensions. As a result, firms will make sub-optimal pension provision decisions driven by short-term reporting considerations. The problem with this argument is best summed up in Keynes's remark that in the long run we are all dead. Companies fail and are taken over. Even household names in seemingly stable industries disappear. Pension regulators are no longer content simply to hope that everything will come right in the end, and neither are accounting standard setters. Determination of an appropriate rate for discounting such liabilities is a complex matter (arguably, the most appropriate rate to use would be that which would be applied by an insurance company in a buyout). Mark-to-market gains and

losses on pension assets are no less real just because pension trustees decide not to cash them out.

A proper consideration of whether current pension accounting requirements are the best way of informing investors of the impact of a firm's DB schemes on its financial position, performance and prospects is beyond the scope of the present paper. Regardless of how the core data are calculated and presented, we would argue that investors need also to be given supplementary information that will enable them to understand the inherent uncertainties involved in pension commitments that stretch far into the future (Blake et al., 2008).[21] It would seem only sensible that if companies decide they cannot live with their earnings and financial position being subjected to substantial pension shocks, then they should indeed protect their businesses by shifting pension assets out of equities into bonds or cutting back on DB provision. This is what the evidence we have reviewed suggests they are doing. It is hard to argue that DB schemes should be kept in existence if this can only be done by keeping investors and creditors in the dark about the risks involved.

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[21] Empirical studies show that measurement and presentation does matter. For example, the use of the expected rate of return to smooth out fluctuations in actual pension returns in the US resulted in the substantial over-valuation of a number of S&P 500 companies with DB plans (Coronado and Sharpe, 2003). Moreover, such valuation errors have persisted even when problems with pension smoothing became more generally known, suggesting that footnote disclosure is not enough (Coronado et al., 2008). Evidence suggests that pension accounting presents considerable opportunities for 'creative accounting' – see, for example, Kiosse (2007) for a review of this literature and additional evidence – making it also important to disclose the key assumptions used in measuring pension amounts.

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