
Academic Article

A critical perspective of pension tax arbitrage

Received (in revised form): 20th October 2009

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ABSTRACT Pension tax arbitrage theory is controversial in that it concludes that defined benefit (DB) pension plans should shift all their assets to bonds. Pension tax arbitrage may occur when a change in asset allocation of a DB pension scheme together with a change in the financing structure of the sponsoring employer firm results in additional tax-based financial returns without increasing the overall financial risk. A share buyback may be financed by an issue of bonds, and the assets of a pension plan (PP) may be shifted from equities to bonds issued by external companies. Tax advantages arise if interest on corporate debt is tax-deductible, while risk neutrality assumes that shifting assets in a DB pension plan from equities to bonds reduces risk to an extent that exactly offsets the increased risk associated with higher corporate gearing. This article considers the practical relevance of the theory of pension tax arbitrage and how to assess the impact of reported financial information on the market capitalisation of the sponsoring companies. Concerns over large and increasing pension fund (PF) deficits have added to the sense of urgency to seek more conclusive evidence of the practical impact of PF asset allocation decisions, including those based on pension tax arbitrage strategies. The main contribution of this article is to develop an insight into pension tax arbitrage in the light of accounting standards, government policy objectives and corporate pension investment policy. Further research is recommended to explain the asset allocation of PPs and in particular the reasons why so few company boards apply pension tax arbitrage strategies, and to assess the value relevance of PP asset allocation information.

Pensions (2010) 15, 49–61. doi:10.1057/pm.2009.32

Keywords: pension tax arbitrage; corporate gearing; pension fund deficit; value relevance; pension plan asset allocation

INTRODUCTION

Pension tax arbitrage may be defined as a process in which a business entity that is the sponsor of a defined benefit (DB) pension scheme makes tax-based risk-neutral financial

gains from a debt-financed equity buy-back with a simultaneous shift in the pension scheme's assets from equities to bonds or other debt instruments.

Pension tax arbitrage models were developed in the early 1980s by Fischer Black¹ and Irwin Tepper.² These studies of three decades ago stimulated discussion in academic and professional circles. The conclusions were controversial in that they recommended that DB pension plans shift all their assets to bonds. The theory was energetically

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debated in the early 1980s and then there was apparently little development of the discussion until the revival of interest after 2000. A number of studies³ considered aspects of pension tax arbitrage but it would appear that there has been relatively little impact on pension plan (PP) asset allocation strategy. This article reviews pension tax arbitrage theory and considers whether it is poised to have a greater impact on pension fund (PF) investment strategy from 2010 onwards.

Pension tax arbitrage may be illustrated by considering a DB pension plan operating through a PF and a sponsoring company (referred to in this article as ‘SponsorCo’). For analysis purposes it may be assumed that SponsorCo funds all the investments by the PF, which may be in the form of equities or bonds. The first basic assumption is that if the PF shifts its investments from equities to bonds there will be a reduction in the risk to the PP and consequently to SponsorCo. The second basic assumption is that this reduction in risk may be offset by a corresponding increase in the risk of SponsorCo if it buys back its own shares and issues bonds. If the risk is exactly offset there will be an overall benefit in the form of a tax reduction on the payment of interest on the bonds.

AN OUTLINE OF THE BLACK MODEL

The Black Model¹ looks at the creation of arbitrage by tax-advantaged structuring with higher gearing and hence more risk in SponsorCo’s capital structure. The Tepper Model differs from that of Black¹ in that it looks at the creation of arbitrage by the tax-advantaged transition to more risk in the shareholder’s personal portfolio.

Black suggests that almost every corporate PF should be invested in debt instruments (or ‘fixed dollar investments’) such as short-term paper, long-term bonds or insurance contracts. Black acknowledges that there is a common assumption that, in the long run, shares will outperform bonds, but he uses a model to explain how this potential problem is overcome with a ‘two-part change’ involving a combination of a change in the PF investments and a change in the firm’s capital structure.

A significant feature of Black’s model is the conclusion that the tax rate is the sole determinant of the benefits of pension tax arbitrage – and, in common with some of the most famous formulae, it is deceptively simple.

The main formula¹ is:

$$PV = XT$$

The present value ‘PV’ of the benefits of tax saving is equal to the value of shifted assets, that is, the value of equities sold by the PF and replaced by bonds, X times SponsorCo’s marginal tax rate T .

SponsorCo will benefit from tax deductions on pension contributions. Any surplus or shortfall in the PF would also have to be adjusted by the marginal tax rate to determine the effect on SponsorCo. Therefore, an asset investment of X in the PF would require funds of $X(1 - T)$. The annual tax savings are explained by applying the rate⁴ of interest R and the marginal tax rate T to the required funding level.

The basic model may then be derived from the following steps:

- SponsorCo debt (in \$) issued and same amount of SponsorCo shares bought back

$$= X(1 - T)$$

- Deductible expenses for tax

$$= X(1 - T)R$$

- Taxes saved each year

$$= X(1 - T)RT$$

- If the Company stays healthy enough to pay taxes every year the tax saving is a near certainty
- If the tax saving lasts indefinitely the PV may be found as follows:

$$PV = X(1 - T)RT / (1 - T)R = XT$$

It can be seen that the present value of the tax savings is calculated by discounting using the tax-adjusted interest rate as the discount rate.

One part of the two-part change is the capital structure change involving the buy-back of some of the company's shares. Black's analysis¹ assumed that in the long run the company's shares will return more than the company's bonds, and the gains from the capital structure change 'when times are good' will offset the losses from the switch from shares to bond investments in the PF. After such offsetting effects, all that is left is the tax effect, which increases the value of SponsorCo.

In spite of the fact that SponsorCo's PF is legally separate from SponsorCo itself the PF investments have a greater effect on SponsorCo than on the PF's beneficiaries. A development of this line of reasoning is that losses in the PF are borne entirely by SponsorCo but that gains are effectively enjoyed by SponsorCo. In effect according to Black's analysis¹ the assets of the PF are almost like assets of SponsorCo so that changing the risk of the PF's investments is like changing the risk of SponsorCo's own assets.

The crucial point about the development of this relationship proposed in the Black Model is the assumption of continuity and the use of a certain rate to discount the cash flows – it may be observed that the same rate R is assumed as the interest rate on SponsorCo bonds and the interest rate on bonds held in the investment portfolio of the PF. This is one of the simplifying assumptions that are so often necessary to produce such an academically elegant model. An important question is whether it is relevant in the world of the practitioner and manager.

DEVELOPMENT OF BLACK'S MODEL – THE TEPPER MODEL

Irwin Tepper² was one of the first academics to acknowledge the importance of Black's work, while at the same time introducing his own model and providing a number of other interesting viewpoints. The Tepper Model looks at the position at the level of the shareholder's personal portfolio. It is more appropriate for the purposes of this analysis to concentrate on the position of the sponsoring company and the pension scheme, and therefore Tepper's paper is not considered in great detail here (even though

it is interesting in its own right). It will be sufficient to highlight some of the more interesting aspects of Tepper's analysis.

The Black and Tepper papers both recommend that firms should invest the DB pension plan assets in bonds. Nevertheless, there is a major distinction between the two models in terms of the capital market equilibrium that is assumed. Black uses an assumption of capital market equilibrium based on the Modigliani and Miller Model introduced⁵ in 1958 and updated⁶ in 1963. Therefore, Black¹ assumes that the *pre-tax* risk-adjusted returns for bonds and equities are equal. The Tepper Model² contrasts with Black's analysis in that it is based on the Miller Model⁷ (produced in 1977) of capital market equilibrium, which assumes that the *after-tax* risk-adjusted returns for bonds and equities are equal.

The tax benefit in Black's model is a function of the corporate marginal tax rate, whereas the tax benefit in Tepper's model, in particular cases, is a function of the personal marginal tax rates on equity and bond income. From the point of view of SponsorCo the interest rates are likely to have an important impact in funding decisions especially where SponsorCo is considering an issue of corporate bonds. The next section looks at the potential combined effect of interest rates and tax rates on SponsorCo.

A CONSIDERATION OF INTEREST RATES AND TAX RATES

The Black Model¹ assumes that the tax rate is the sole determinant of the benefits of pension tax arbitrage. The cash flows are capitalised and in effect treated as perpetuity. The appropriateness of this capitalisation approach may be questioned owing to the instability of tax rates and uncertainty of arbitrage conditions in many international jurisdictions.⁸ If the annual cash flow savings are considered, these may be affected by the interest rate as well. It will be recalled in the outline of the Black Model that the annual cash flow savings were as follows:

$$\text{Annual Cash Flow Savings} = X(1 - T)RT$$

The term X represents the value of the equities sold by the PF and replaced by an equivalent amount of investment in bonds. The term T is SponsorCo's marginal tax rate and R is the interest rate on bonds (the same for both the PF investments and SponsorCo-issued bonds).

Analysis of the annual cash flow savings formula reveals that there are offsetting tax effects. On the one hand, the higher the corporate tax rate the greater are the potential tax benefits of interest deductibility. On the other hand, the corporate tax rate works in the opposite direction by reducing the proportionate effect on capital structure of a switch in assets. A simple example may be used to demonstrate how the maximum tax impact occurs when the tax rate is 50 per cent. The tax impact decreases if the tax rate falls below 50 per cent or rises above 50 per cent. The impact on annual cash flow savings increases as interest rates rise, as illustrated in the example of a reallocation of investments of £1 billion from equities to bonds, with results summarised in Table 1.

The results in Table 1 demonstrate how at a very low interest rate such as 1 per cent, there will be very little effect. On the other hand, at high rates of 10 per cent or more there may be a significant impact, especially as the tax rate moves closer to 50 per cent. It may be concluded that

both tax rates and interest rates have an impact on potential annual cash flow savings.

An analysis that has been carried out in a study by Damanpour and Marshall⁸ across different international jurisdictions suggests that the applicability of tax arbitrage strategy varies considerably, and therefore the fiscal and monetary environments in some countries may offer significant annual cash flow advantages, whereas a country such as Japan with a relatively low interest rate would offer only small benefits. Damanpour and Marshall estimated that the annual cash flow advantage could be between 90 and 199 basis points (0.9–1.99 per cent) for countries where pension tax arbitrage is viable (including the United Kingdom, the USA and Canada) or as low as 36 basis points (0.36 per cent) in Japan.

The position has changed as a result of the global financial problems and tight credit conditions from mid-2007. It is harder to perform analysis, as low official interest rates and 'soft' monetary policies in many nations have coincided with relatively high and diverse corporate interest rates. This is one of the topics that is likely to occupy academics and professional researchers in the future.

The impact of dynamic tax systems may also be considered; for example, Black and Tepper

Table 1: Annual cash flow savings at different tax rates and interest rates

| <i>Annual cash flow savings (£ million) at interest rates of R=</i> | | | | <i>Tax rate T (%)</i> |
|---|-----------|------------|------------|-----------------------|
| <i>1%</i> | <i>5%</i> | <i>10%</i> | <i>15%</i> | |
| 0.90 | 4.50 | 9.00 | 13.50 | 10 |
| 1.28 | 6.38 | 12.75 | 19.13 | 15 |
| 1.60 | 8.00 | 16.00 | 24.00 | 20 |
| 1.88 | 9.38 | 18.75 | 28.13 | 25 |
| 2.10 | 10.50 | 21.00 | 31.50 | 30 |
| 2.28 | 11.38 | 22.75 | 34.13 | 35 |
| 2.40 | 12.00 | 24.00 | 36.00 | 40 |
| 2.48 | 12.38 | 24.75 | 37.13 | 45 |
| 2.50 | 12.50 | 25.00 | 37.50 | 50 |
| 2.48 | 12.38 | 24.75 | 37.13 | 55 |
| 2.40 | 12.00 | 24.00 | 36.00 | 60 |
| 2.28 | 11.38 | 22.75 | 34.13 | 65 |
| 2.10 | 10.50 | 21.00 | 31.50 | 70 |
| 1.88 | 9.38 | 18.75 | 28.13 | 75 |

Based on the formula $ACFS = X(1 - T)RT$.

Assuming £1 billion of assets (X) are reallocated to bonds.

The shaded area indicates the maximum annual cash flow savings at a tax rate of 50 per cent.

have assumed a constant corporate tax rate with a certainty of tax deductions, and so as a result they have concluded that the marginal benefit in a tax deduction arising from pension contributions would be constant. This assumption may not be valid in a situation where there is a progressive corporate tax structure.⁹ It might be expected that pension tax arbitrage strategies would be less likely to be adopted if the SponsorCo is subject to lower taxes and hence the marginal tax benefit is lower. Therefore, PF asset allocation decisions might be less influenced by tax considerations.

The analysis may also be extended to the prospects of companies seeking to 'overfund' DB pension plans in order to exploit the pension tax arbitrage potential. Companies may be incentivised to overfund DB pension plans when the marginal tax rate is high, and reduce the level of funding when the marginal tax rate is low.¹⁰ A reduction in funding of the PP may be implemented by reducing the contributions or withdrawing excess funds through a reversion that involves termination of the PP and settlement of the liabilities. Thomas¹⁰ finds that there is a positive relationship between pension-funding decisions and the company's tax status, but observes that there are non-tax reasons for PP overfunding.¹⁰ Non-tax reasons might include the scale and characteristics of the pension scheme. The analysis of withdrawal of PP assets in particular has proved to be quite complex and probably not sufficiently conclusive to assist in PF strategies. In view of the inconclusive empirical results examining the possible link between the pension reversion decision and tax status it has been suggested that it may be better to look at the 'differential tax benefits' of different withdrawal methods.¹¹ Such analysis really goes beyond the subject of pension tax arbitrage, and therefore it is better to turn to another matter of considerable importance, 'value relevance'.

PENSION TAX ARBITRAGE AND VALUE RELEVANCE

'Value relevance' is a term used to describe the relationship between stock market values and reported accounting information.¹² The academic literature on this topic extends back

over 40 years.¹³ Although doubts have been expressed about the usefulness of empirical studies of value relevance for accounting standard setters,¹⁴ a major use of financial statements is for equity investment decisions¹³ and that is of most interest in PF asset allocation.

It is possible that even if information is not directly reported in a company's balance sheet such information can still influence the share price.¹⁵ Market investors appear to be capable of understanding matters such as unfunded pension liabilities and corporate debt and this suggests that they are unlikely to be confused about the potential financial implications for the company.¹⁶ The broad conclusion is that PF performance as communicated by the accounting information is statistically significant to the sponsoring company's market capitalisation. In that sense, accounting information may be described as 'value-relevant' – however, this is still a controversial subject in accounting and capital market research¹⁷ and since it may explain the way in which PF asset investment decisions are reflected in share prices it deserves further consideration in this article.

VALUE RELEVANCE – EMPIRICAL STUDIES AND TAXATION

Only a small number of value relevance studies discuss the impact of taxes on regression results in any detail.¹⁸ The main value relevance models seek to identify a relationship between the market capitalisation and certain accounting measurements in the published financial statements. The models have evolved from 'earnings models' to 'balance sheet models' and then to combined models that take account of items from the income statement and balance sheet.

One of the earliest earnings studies was published in 1984 by Daley,¹⁹ and looks at the relationship between pension costs and the share price. Doubts were expressed about the results owing to the small sample size and possible measurement errors in the data, as different cost methods were permitted under the then prevailing US accounting standard. Later studies were able to go further, so for example, a study

by Barth *et al*²⁰ separated the various pension cost components.

The first balance sheet model created by Landsman²¹ split the companies' total assets into pension assets and non-pension assets and the companies' total liabilities into pension liabilities and non-pension liabilities. Landsman finds that information on pension assets and liabilities is value-relevant, as does Dhaliwal.²² Nevertheless, some commentators such as Glaum¹⁸ have expressed doubts about the statistical reliability of the results. A number of researchers have also commented on the difficulty of interpreting corporate pension accounting information.²³ The theme of transparency of accounting information continues to be important in value relevance studies.

Other value relevance models called the 'combined models' consider balance sheet and income measures simultaneously – the initial development of these models is often attributed to Ohlson.²⁴ Studies have also considered the market efficiency and the link between financial information and share prices. In an efficient market the share price should reflect the book value and the discounted present value of the forecasted residual income stream.²⁵ Limitations and inefficiencies in the analysts' information-processing may prevent prices from fully reflecting the financial statement data unless it is possible to draw upon a 'rich set' of publicly available data.¹⁷

Empirical studies carried out to assess the relative importance of balance sheet and income statement items have been largely inconclusive. One US study concludes that there is a greater correlation between balance sheet items (the pension assets and pension obligations) and share price valuations than between income statement items (pension cost components) and the share price valuations.²⁶ Another study²⁷ using a sample of US companies comprising the Standard and Poor index over the years 1993–2001 finds that the pension income and expenses (not balance sheet information) are relevant for the purposes of explaining share prices. A more recent working paper²⁸ extends the period of investigation to the years 2002–2005 and has results similar to the earlier study.

One of the key questions is how capable investors and other users of financial information are of interpreting that information. It has been suggested, for example, that investors tend to overvalue companies that sponsor DB pension plans.²⁷ This concept has been taken further by Franzoni and Marin,²⁹ who find that the stock market significantly overvalues companies that have severely underfunded PPs. On this basis we might question how efficiently the market can reflect complex reported information including any disclosures about tax and tax-influenced investment strategies.

Previous academic literature has considered and compared the value relevance of items that are presented on the face of the financial statements and items that are merely disclosed in the notes to the financial statements. Picconi³⁰ concludes that investors do not accurately assess the long-run cash flow and earnings implications of 'off balance sheet' pension disclosures. This result might call into question the prospects that pension tax arbitrage strategies are recognised by investors in the course of financial analysis. Nevertheless, such conclusions are contrary to the viewpoints in earlier studies such as those by Oldfield¹⁵ and Feldstein and Seligman,¹⁶ and at the very least, suggest a need for further research into these aspects.

If there are concerns about the ability of investors and other users to use pension-accounting information, what is the likely impact of 'fair value' accounting? This has been considered in a further US study by Hann *et al*.³¹ Research findings suggest that pension cost components are 'less persistent'³² and hence less value-relevant under fair value accounting. The studies themselves have been quite significant – Hann *et al*³¹ use data for more than 2000 US companies in the years from 1991 to 2001, and another study by Kiosse *et al*³³ arrives at similar results using US data with a sample comprising 3388 firm years for the years from 1998 to 2005.

The studies considered here provide strong indications that PF accounting information is 'value-relevant', but there are still a number of issues that require further investigation – for example, the impact of tax legislation and tax-driven PF asset allocation.

CORPORATE PENSION POLICIES AND DIVERGENCE FROM THEORY

For nearly three decades the investment policies of corporate PFs have diverged from the prescriptions of the theoretical work of Black and Tepper. Some of the discussion of the impact of tax on corporate pension policy involves the case for prefunding PPs in order to exploit the tax advantages. Tepper identifies a tendency for companies to prefund pension benefits as a result of conservative actuarial assumptions.² Just how 'conservative' these assumptions have been may be seriously questioned in the light of the subsequent developments in pensions accounting analysis and, in particular, the measurement of the liabilities of the PFs. With the benefit of hindsight there is much criticism of the pension contribution 'holidays' that arose during periods of high growth in equity portfolio valuations.

Black¹ makes the point that an investment in the 'firm's stock' (SponsorCo's shares) would be just as good as an investment in equities through the PF – that is, if it is assumed that SponsorCo's shares perform as well as the PF's share investments. Perhaps this assumption is a weakness of the analysis or at least an aspect that requires the development of a more flexible model. Damanpour and Marshall⁸ express the view that the implementation of the pension tax arbitrage strategy 'must address the inability of the investing public to see beyond the pension plan itself'. Pension tax arbitrage strategies are based upon the notion that the PP is a consolidated entity of the sponsoring company and not merely a stand-alone special purpose vehicle.

For the most part, empirical studies find no evidence of a relation between SponsorCos' tax benefits and their DB pension plans' investments in bonds after controlling for non-tax factors.³ However, in a significant study and contrary to the findings of earlier researchers, Frank³ does find evidence of sponsoring companies trading off tax benefits and non-tax factors as described by Black. The non-tax factors include the size of the SponsorCo, the size of the DB pension plan and the volatility of earnings. Market imperfections such as DB termination costs may also have an impact.⁹ Frank³ estimates a regression of the

percentage of DB assets invested in bonds on the tax benefits from the arbitrage strategy and finds a positive and significant relationship between DB bond allocation and the SponsorCo's tax benefits.

THE ULTIMATE SPECIAL PURPOSE ENTITIES

DB pension plans have become so large that any significant change in investment behaviour is likely to have a macro-economic impact. Gold and Hudson³⁴ describe corporate DB funds as 'the giants of the special purpose entities', which at the time of writing their paper in 2003 were estimated to own a trillion dollars of equity or more than 10 per cent of US stock market capitalisation. Gold and Hudson³⁴ also comment on the fact that it was 20 years after the Black and Tepper proposals that a major UK pharmaceutical retailer, Boots, undertook a strategy consistent with pension tax arbitrage so that it moved from a position where the PP assets were composed of 75 per cent shares and 25 per cent bonds at the year-end 1999 to a portfolio of 'duration-matched' bonds by July 2001. More generally there has been resistance to proposals to change investment policy that would be characterised by switching from equities to bond investment. The traditional strategy has been based on the expectation that equities will outperform bonds over long periods and are therefore a better match for long-dated liabilities.

If there were expectations that the new strategy adopted by Boots in 2000 and 2001 would lead to a new trend in PF asset management the following years must have gone some way to reverse that anticipation. This may have had something to do with the long-standing arguments of many investment professionals in favour of equities. Gold and Hudson³⁴ suggest that there were several obstacles including 'confusion' over accounting rules. Nevertheless, the revisions to the international accounting standards and ongoing discussions aimed at improving pensions accounting have also been greeted with optimism in some quarters – although the focus of this article is pension tax arbitrage, it will consider this matter of accounting standards a little further.

ACCOUNTING STANDARDS – THE NEW TRANSPARENT WORLD

Greater accounting disclosure requirements may affect corporate decisions in relation to DB pension schemes and investor decisions in relation to corporate sponsors of DB pension schemes. Even if there is discretion in the choice of accounting methods there may be greater convergence of measurement assumptions such as discount rates as disclosure expectations and audit requirements tighten. Increased disclosure may encourage corporate managers to look at ways of breaking the link between the PP and the SponsorCo through the market for pension buy-outs or partial buy-outs including structured finance arrangements that share risk with financial institutions such as major insurers.³⁵ Consistent with this theme Damanpour and Marshall⁸ have considered how greater disclosure may prompt SponsorCos to consider pension tax arbitrage strategies in the international context. Nevertheless, there is potentially a large difference in the impact of information provided on the face of the financial statements compared with information that appears merely in the form of notes to the accounts. There is a risk that investors may not efficiently analyse or pay sufficient attention to footnotes with a US study suggesting that investors do not correctly perceive the influence of DB plans on corporate valuation in the US marketplace.²⁸

A major part of the discussion of accounting standards has centred on the treatment of pension liabilities, although attention is turning to the asset side, especially following the turbulence in financial markets. The combination of increasing accounting disclosures and the greater awareness of the extent of investment exposure has created a very demanding PF management environment. ‘Transparency’ is likely to remain a key objective in financial reporting, and the wish to avoid unpleasant surprises in the financial markets may drive decisions to move to more structured financing of PPs. Perhaps we will see the composition of DB pension fund assets changing to duration-matched bonds as the years go by. Nevertheless, questions should be raised about the extent to which accounting standards may influence investment decisions and whether this

has inherent dangers. This is not a new theme and it remains important to consider how the accounting standards might affect financial reporting and the decisions of company managers and investors in shares.

The choice of discount rate is a major issue in considering pension liabilities. One study³⁶ in the United Kingdom looked at the stock price returns over a period when UK companies either voluntarily adopted or did not adopt market-based discount rate assumptions – they concluded that the difference between pension asset values and discount rates is potentially value-relevant to capital market participants for assessing the option to terminate PPs. The possibility of terminating DB pension plans remains one of the most highly sensitive strategic management decisions.

The ongoing debate about the adequacy of pension accounting, including the need for increased disclosure levels, has prompted discussion and some new proposals, for example by the European Financial Reporting Advisory Group (EFRAG) and European Standard Setters.⁴¹ The adequacy of financial reporting with its emphasis on a single figure for PF deficits or surpluses at the balance sheet date has been questioned.³⁷ Other possible disclosures include sensitivity analyses to demonstrate the impact of different possible outcomes of, for example, pensioner longevity statistics.³⁷

The importance of accounting for the liabilities of PPs is already widely acknowledged. It is also becoming increasingly clear that significant attention needs to be paid to the implications of accounting for PF assets as well. An understanding of the composition of the PF assets distinguishing between investments with taxable and non-taxable returns is central to value relevance of financial information reflecting pension tax arbitrage strategies.

POLICY IMPLICATIONS OF PENSION TAX ARBITRAGE

To complain of the age we live in, to murmur at the present possessors of power, to lament the past, to conceive extravagant hopes of the future, are the common dispositions of the greatest part of mankind. Edmund Burke³⁸

In an era of large budget deficits, national governments are inevitably concerned about the problem of reconciling the desire for tax allowances with the need to raise tax revenues. On the one hand, pension tax arbitrage may reduce the sponsoring company's tax bill and hence the government's tax revenues, but on the other hand well-funded PPs are less likely to default and cause a drain on the Pension Protection Fund or 'PPF' (to consider the UK example). A similar point has been made by Gold and Hudson³⁴ in relation to the US regime in which The Pension Benefit Guarantee Corporation (the US equivalent of the United Kingdom's PPF) has to fund large shortfalls of 'billions of dollars' following the failure of companies with underfunded plans.

Pension tax arbitrage has potential implications for monetary policy as well as fiscal policy objectives. At a time when both the United Kingdom and the USA need to issue more government stock to fund shortfalls that the tax system cannot hope to cover, the replacement by PFs of equities with government bonds could be very beneficial for the respective government treasuries. However, if PF trustees are showing increasing enthusiasm for bond investments in preference to equities there are still critics within the investment management profession. 'Liability-driven investment' is associated with switching PF investments to bonds in the manner considered in this article. However, many investment managers seem to be doubtful about bond investment strategies in the future.

A COMMENT ON CORPORATE GEARING AND INVESTMENT POLICY

Equations are more important to me, because politics is for the present, but an equation is something for eternity. Albert Einstein³⁹

Einstein seemed to identify an important distinction between the short-term priorities of politics and the longer-term relevance of mathematical or academic analysis. Yet the previous discussion suggests that the politics

and mathematics of pension tax arbitrage may actually be aligned. Even if this is the case, it is less clear whether the objectives at the corporate level are aligned with the pension tax arbitrage models.

Black¹ considered the scope for debt-funding at various levels ('senior' and 'junior') and it is worth revisiting this discussion before considering the possible relevance to corporate finance. If the position of the SponsorCo is considered in isolation – rather than including the PF – one conclusion is that the short-term effects of increased gearing may include reduced cash flows if the dividend yield is lower than the after-tax interest rate on SponsorCo's bonds. In this case the debt is more expensive than the equity it replaces. Black¹ points out that his 'plan' (he did not actually refer to it as a 'pension arbitrage strategy') involving the PF investing in bonds, and the SponsorCo changing its capital structure by issuing bonds and buying back SponsorCo shares will improve long-run cash flows.

Capital structure changes must be consistent with bond indentures – these are conditions that generally restrict the amount of additional debt SponsorCo can take on. Following Black's reasoning, when the benefits of a pension tax arbitrage strategy are great enough, SponsorCo may want to look beyond the limits imposed by its bond indentures when those limits seem too binding. One solution may be to use 'junior' debt or 'mezzanine' financing that is not restricted by the bond indentures. Black argued that the interest rate differential between junior and senior debt will rarely be as large as the differential between pre-tax and after-tax interest rates. Furthermore, Black¹ makes the point that the differential will be offset if the PF invests in debt securities equivalent to those issued by SponsorCo. One further matter to consider is the potential effect an issue of debt may have on the senior debt rating. A junior debt issue will arguably not have much effect on the ratings for the SponsorCo's senior debt, as the junior debt will naturally rank behind the senior debt in terms of security for repayment of principal in the event of a winding up (and usually payment of interest as well). The evolution of forms of

mezzanine financing including high yield notes and various corporate bonds means there is plenty of scope for gearing up a sponsoring company.

A major criticism of investment in debt relates to the removal (or significant reduction) of investment value upside potential, which is the key attraction of equity investment. In 2008, there was a major credit crisis and collapse in equity markets in the United Kingdom and the USA, whose governments have undertaken counter-deflationary measures that include the reduction in interest rates to their lowest levels since before the Second World War. On the one hand, this could be considered an ideal time for DB pension sponsoring companies to buy back their (cheap) shares and enjoy low-cost financing by issuing corporate bonds at low interest rates. Unfortunately and not surprisingly, this is not as simple as it sounds. First, corporate bonds have relatively high margins⁴⁰ in the current risk-averse investment climate – so there is a considerable divergence or investment premium between the official ('risk-free') interest rates and the commercial rates of interest. Second, the pension tax arbitrage strategy as outlined in this article requires the replacement of equities in the PF with an investment in bonds – weak equity markets mean that there will be very large book capital losses in the investment portfolios that may have as much as 75 per cent invested in equities. So it may not be a good time to sell the equities if the PFs fear the crystallisation of large losses. On the other hand, bonds may have to pay quite high margins for the reasons mentioned earlier – although in the current market many investment managers will be exercising considerable care to ensure that these rates do not reflect genuinely high risk as opposed to capital market imperfections or cyclical factors.

One problem in attempting to apply pension tax arbitrage theory is that it is based on a general view of categories of 'debt' (or bonds) and 'equity' (or shares/stocks) when it is the specific characteristics of securities that really matter in practice. Tax advantages may enhance investment performance but should tax incentives actually drive investment strategy? The wholesale replacement of equities with bonds may be an

example of a tax-driven investment strategy that results in sub-optimal returns, but it is likely to be difficult to prove this without an extensive study over many years. Those who have to take the crucial decisions may be influenced by data such as those produced by analysts in Barclays Capital in 2009, finding that shares outperformed bonds over 10 consecutive years of investment in 81 out of 100 years (81 per cent) and over 18 consecutive years of investment in 83 out of 92 years (90 per cent).⁴² Immediately, the criticism may be made that this analysis is inconclusive in view of the need to use aggregated historic data – for example, who can really say whether the historical information remains relevant to future markets? Nevertheless, any fund manager considering a significant change in the composition of an investment portfolio should probably be considering similar and indeed more detailed data before reaching a decision.

The complexity of the task facing decision-makers trying to achieve the optimum asset composition of an investment portfolio also appears to be demonstrated by the history of stock market performance. Feldstein and Seligman¹⁶ refer to the poor performance of the stock markets in the 1970s and state that the S&P composite index of common stock prices fell 47 per cent in real terms between 1969 and 1979.

Companies that are listed on the international stock exchanges often have a high public profile and consequently may have investor perception concerns. In such companies high levels of corporate gearing add to the investor perception concerns but it is equally likely that large and fluctuating PF deficits are a major distraction for the management.³⁵ Even if a pension tax arbitrage strategy reduces or substantially solves the problem of fluctuating PF deficits it may nevertheless have a negative impact on perception unless the total entity risk concept is fully understood and accepted by investors. To take this further, even if there is a favourable investor response to the pension tax arbitrage strategy there is arguably a more important financial management flaw in the longer term. Pension tax arbitrage is based on the assumption that the PP is necessarily part of one effective risk entity

comprising the PF and SponsorCo. This could be sub-optimal in the sense that the funding strategy of an operating company, SponsorCo, is being driven by the tax status and financial obligations of a PP. However, the link between the PF and SponsorCo is not permanent and unbreakable. There exists the alternative to break the link between SponsorCo and the PF – as more DB schemes mature there may be greater scope for buy-outs or partial buy-outs of PPs, and although cost may be prohibitive for some large PPs there are also limited recourse risk management solutions that may be applied to certain cohorts within a pension scheme. This option has been considered in a paper by Kirkpatrick.³⁵

If the size of the PF deficit at any time makes a pension buy-out transaction impractical then it is highly likely that a pension tax arbitrage strategy will also be unpalatable to management, as the deficit will effectively be locked in. The recovery potential of PFs in deficit will be removed because of the absence of significant upside valuation potential of fixed income investments.

CONCLUSION

In spite of the strong theoretical basis the practical application of pension tax arbitrage strategy appears to have been limited to a few high-profile cases.

A number of studies over some 25 years conclude that if pension tax arbitrage strategy is to be applied more often it will be necessary to educate decision-makers to ensure that the key matters of risk-free enhancement of returns are fully appreciated. This viewpoint is questionable. It is possible that decision-makers are rejecting pension tax arbitrage for the wrong reasons but it is also possible that they are sensibly rejecting the pension tax arbitrage 'solutions' even though their decisions may be based on commercial instinct rather than intellectual rigour. Corporate managers may find the prospects of a certain deficit less acceptable than the possibility of recovery through equity investments no matter how uncertain.

Supporters of pension tax arbitrage strategies also argue that decision-makers such as company managers and PF trustees often fail to recognise

the total entity risk concept. Yet potential risk management solutions such as pension buy-outs offered by the insurance industry might be considered preferable to pension tax arbitrage strategies. There are arguments for separating industrial companies from PPs. This may be achieved by transferring the PPs to the insurance industry that is probably better placed to understand and manage the long-term risks. There are regulations protecting pension scheme members in most jurisdictions, and the link between a SponsorCo and a PP can usually only be broken if strict legal and financial conditions are met.

Even if the arguments for pension tax arbitrage strategies are rejected, the benefits of tax-deductible bond investments should not be ignored. Even a rejection of a total bond-shift strategy leaves open the possibility of a more balanced investment portfolio including listed equities, bonds, real estate and 'alternative investments' such as private equity. Future research should be undertaken to determine how the preference for equities reflects precise analysis rather than a lack of sufficient understanding of the attributes of bonds and other types of assets. New research might also consider the fairest and most efficient tax policy for DB funds.

Pensions finance may be affected by both fiscal and monetary policy. On the one hand, pension tax arbitrage may reduce the sponsoring company's tax bill, but on the other hand more securely funded PPs are less likely to be a drain on the PPF and as a result less of a burden on the UK taxpayers. An important question is whether pension tax arbitrage strategies really do result in more securely funded PPs. It may be that in the future there will be greater alignment of the national interests and the needs of companies sponsoring DB pension schemes, especially if there is increased funding through long-term bond issues in both the private and public sectors.

ACKNOWLEDGEMENTS

I thank Dr Jonathan Edwards, Dr Geoff Willcocks and Dr Ann Hansford of

Bournemouth University Business School
for their helpful comments and suggestions.
Any errors or omissions are mine.

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The PAAinE initiative is a partnership between the European Financial Reporting Advisory Group (EFRAG) and European standard-setters.

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