Impact of target company pension liabilities on takeover premium, bidder's choice of payment currency and shareholder returns

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Abstract

In recent years the importance of employee pension schemes sponsored by companies to the financing and investment policies of those companies has been recognised. Using a sample of 138 transaction with firm listed on the London Stock exchange, this paper contributes to this literature by showing that the defined benefit pension scheme of a target discourage potential bidders from acquiring such type of sponsoring companies. . Bidders avoid paying by cash when targets operates a high risk DB scheme, thus prefer paying with stock or mixed currencies to minimise the pension scheme related risk arising from the acquisition. We find that while larger deals they are more likely to offer stock or more non-cash currencies, larger and more profitable acquirers are more likely to offer cash. Bidders are also more inclined to offer cash for diversifying acquisitions pointing to a risk avoidance behaviour. This paper also shows that the riskier the target pension scheme the smaller are the shareholder wealth gains to bidder shareholders around bid announcement. This is consistent with the hypothesis that there is loss to the value of shareholders when they operates in risky pension schemes.

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1. **Introduction**

In recent years the importance of employee pension schemes sponsored by companies to the financing and investment policies of those companies has been recognised. In principle the pension fund commitments are part of the liabilities of the sponsor firms and where the pension scheme assets fall short of the level considered adequate for the purpose of meeting the pension scheme liabilities i.e. in the event of a 'pension (funding) deficit' the sponsor becomes liable to contribute additional funds to meet the deficit. Such a contribution may be voluntary but in many jurisdictions such as the US or the UK, it may be mandated by a pension regulatory regime established under law. Such contributions constrain the funds available for the sponsor to finance the corporate investment programme or may force the sponsor to raise the necessary funds through new equity issues or debt.

Pension schemes are of different types. In defined benefit (DB) schemes, both the employer and the employee contribute periodically an agreed amount or percentage of the employee's salary and other relevant employment-related benefits. The members are guaranteed post-retirement benefit levels that are often a positive function of their length of service and final salary and other relevant benefits at the time of retirement. The employer or scheme sponsor is, however, liable to meet the commitment to paying the post-retirement benefits. The scheme's liabilities towards its members are thus the liabilities of the corporate sponsor. The contributions made by the employer and the employees are invested and the assets so created are the source of funds used to meet the pension liabilities. Where the liabilities exceed the assets i.e. there is a funding deficit, the sponsor may have to make additional contributions to eliminate the deficit or reduce it in accordance with an agreement with the trustees of the pension scheme. Pension scheme liabilities are legal liabilities of the sponsor firm. In several countries a pension regulator has the power to mandate and enforce contribution towards deficit reduction e.g. the Pension Regulator (TPR) in the UK.

In defined contribution (DC) schemes, the sponsor contributes an agreed amount or percentage of the employee's salary and other relevant employment-related benefits to the pension 'pot' to which the employee also makes a contribution. These contributions are invested and the accumulated assets become the source of income used to fund the payment of pension benefits in the future. In contrast to the DB schemes, a DC scheme sponsor has no liability to pay a pre-determined level of pension benefit to the members of the scheme on retirement. Thus a DB scheme imposes a much higher liability on the employer than the DC. Since valuation of future liabilities and that of the pension assets over long periods is characterised by substantial uncertainty, a DB scheme poses greater uncertainty to the debt holders and shareholders of the scheme sponsor. This is likely to affect the risk profile of the securities issued by the sponsor e.g. the systematic risk of the equity or the credit rating of the corporate debt or the credit rating of the sponsor. These effects will in turn raise the cost of capital to the sponsor and are likely to influence the investment and financing decisions of the sponsors.

The pension contribution made by an employer to a DB or DC or any other pension plan is a deductible expense for corporation tax purposes. Thus pension contribution provides the sponsor with a tax shield similar to the tax shield for interest paid by a corporate on its debt. This tax shield provides an

incentive for an employer to contribute to the pension scheme in years when its tax liability would otherwise be high.

Conceptually, the DB pension scheme is regarded as a wholly owned subsidiary of the sponsor but is not wholly under its control or administration. A pension scheme is normally administered by trustees some of whom may represent the sponsor but many representing the members of the pension scheme. Such members include active members in the sponsor's employment contributing to the pension fund and retired members drawing their pension benefits. The trustees have a fiduciary duty to the members and are independent of the sponsor. Where the trustee represents the sponsor there will be conflict of interest in their roles as the corporate nominee and as guardians of the members' interest.

Impact of DB schemes on the sponsor's equity and debt risk profile and its costs of debt and cost of equity is likely to influence the sponsor's corporate investment programme. But there is also a direct impact. This arises from the contributions made by the sponsor to the pension scheme. The level of the contribution to a DB scheme depends on the actuarial valuation of the scheme's pension benefit liabilities, the valuation of the pension scheme assets, the funding deficit, the time scale for deficit reduction as per agreement with the trustees, any mandatory contribution imposed by the regulator etc. In addition where a scheme is a member of any statutory or regulatory pension guarantee system, the premium or levy payable by the sponsor in exchange for the guarantee is also a source of cash outflow and a financial constraint on the sponsor.

Since pension liabilities accumulate, and are discharged, over several decades, there is inherent uncertainty associated with estimating the current value of the future pension benefit obligations to members. This depends on expected service periods of members, their longevity, how their compensation levels will evolve to their retirement etc.

In the context of takeovers, a company seeking to buy another company will have to take into account the latter company's pension scheme and its funding position as well as the risk profile of the scheme. The risk profile of the scheme is a function of the risk profile of its assets and that of its pension benefit liabilities. Post-acquisition, the acquirer's risk profile will be altered by the risk profile of target pension scheme and the risk profile of its own pension scheme.

Where the target firm's pension is underfunded, it may lead to the buyer having to contribute towards eliminating that underfunding. This may reduce the attractiveness of the target to the buyer or may impose financial constraints. The buyer needs to take into account how the target's pension scheme will alter its financial and risk profile and its future cost of capital as well as its future investment programme. Since the target firm's DB liabilities will increase the debt exposure of the acquirer, its leverage will increase, thereby affecting its potential credit rating and its cost of debt as well as its cost of equity.

These concerns will be reflected in the takeover premium that the acquirer is willing to pay for the target, the gains from the acquisitions as perceived by the stock market and the way it finances the acquisition. However these consequences will depend on whether the target has sponsored a pension scheme, whether it is a DB or DC scheme, whether in the case of DB it is underfunded and by how much, and what role the pension regulation plays in determining how it discharges its pension benefit obligations including contributions towards deficit reduction and over what time line and the levy or subscription towards any statutory pension guarantee.

It can be surmised that acquiring a target with a DB scheme is likely to impact on the takeover premium, takeover gains and the choice of payment currency more substantially than acquiring a

target with a DC scheme or one without a pension scheme for its employees. The choice of payment currency for the acquisition is also likely to be influenced by the type of pension scheme that the target runs and whether it will continue to be maintained by the acquirer in its present form. It can be surmised that where the target scheme is a DB scheme leading to increased debt exposure of the acquirer, it may choose to finance with a share exchange rather than cash from its own internal resources i.e. its operating cash flow or with debt. In the case of a target with a DC scheme, the acquirer may be less constrained in offering cash or debt. Thus the choice of payment currency is likely to be determined by an interplay of its existing leverage, cash resources and the type of target pension scheme. Thus the payment currency choice cannot be divorced from the acquirer's capital structure decision.

In this study we examine whether, in addition to a range of factors influencing the payment currency choice of a bidder in a takeover, the pension scheme acquired by it as part of its acquisition of a target is a significant factor. Since the payment currency decision impacts on the bidder's capital structure it is also tantamount to a capital structure decision for the bidder. The target pension scheme's impact on the bid outcome was studied by Cocco and Volpin (2013). They find that targets with DB schemes are less likely to be acquired than those with DC and other non-DB schemes, consistent with the higher risk associated with DB schemes. However, the impact of target pension schemes on the payment currency choice of the bidders and the shareholder value gains to bidders conditional upon such choice have not been examined so far.

In this paper we model the acquirer's acquisition financing decisions as a function of the target's pension scheme and as a function of the pension related costs imposed by such a scheme. Such a decision is however jointly determined with the choice of a particular bid target. In an observational sample such as ours this joint decision characteristic introduces a self-selection bias and endogeneity. We model the decision and the shareholder value impact while addressing this bias.

We examine the payment currency choice and its shareholder value impact using a large sample of 138 United Kingdom takeover bids during 2002-12. The UK has a long history of corporate pension schemes that encompass DB, DC and other schemes. It also has the second most active market in corporate control next to the US. Thus it provides an appropriate setting for examining the impact of pension liabilities on the bidders' payment currency choices and the consequent shareholder value outcomes.

We find that the target pension scheme's risk profile has a significant impact on the payment currency choice of the bidder. The more risky DB schemes reduce the likelihood of the use of cash and increase the likelihood of non-cash currencies, in particular, all stock or a high proportion of stock in a mixed currency offer. This is consistent with our hypothesis. We also find that where the target has sponsored a DB scheme rather than a less risky scheme, the announcement returns to bidder shareholders are significantly lower. This result is robust to a range of methodologies that we employ to control for the self-selection and endogeneity.

Ours is the first study to focus on the implications of the target firms' pension schemes and their risk profile for the payment currency and capital structure decisions of bidders in takeovers. Our results are consistent with our hypotheses of a significant impact that such schemes have on the financing and investment decisions of firms. Given the size of pension related liabilities, prior studies that examined the determinants of payment currency seem to have ignored an important factor. We fill this gap in the takeover and corporate finance literature.

2. Review of prior literature on pension funding, corporate investment and firm valuation

Several previous studies have examined the impact of pension scheme underfunding on the investment decisions of the sponsor firms. The conceptual framework they have employed is the relative efficiency of the internal capital market (ICM) of firms and the external capital market. Where the external capital market (ECM) is frictionless i.e. firms can raise unlimited funds with zero/ low costs in the ECM, the need to top up its contribution to its pension scheme to reduce or eliminate underfunding should have a neutral impact on its investment programme since such a contribution can be easily made up by the firm's recourse to the external equity or debt market. Thus the level of cash flow in the ICM of the firm is not of relevant concern and should be uncorrelated with the firm's investment decision. However, the cash flow available to the firm and its investment decisions are mutually endogenous since they both depend on the investment opportunities of the firm.

Rauh (2006) uses the mandatory contribution (MC) required by the US law as an exogenous event that affects the cash flow available to the firm independent of its investment policy. MC is thus a relevant instrumental variable in modelling the endogenous relationship between a firm's cash flow and its investment policy. He finds for a sample of US firms with DB pension schemes that MC requirement has a significant negative impact on their investment programmes. DB firms when faced with a MC requirement are unable to offset the cash flow demand of MC with recourse to ECM, the implication being that their marginal cost of capital rises to a point where some of the investment projects are no longer profitable. This implication is consistent with an ECM that is costly for such firms to access. Rauh concludes that pension underfunding and consequent MC impose financial constraints on DB sponsors and squeeze their investment programme. In contrast, 'investment of firms that do not sponsor DB plans rises with the contribution requirement for DB pension firms in their industry' (2006, p36). Rauh also tests for the impact of MC on corporate acquisitions and finds that 'required pension contributions reduce the probability of making an acquisition but not the magnitude' of acquisitions (p57).

Franzoni (2009) extends Rauh's study of the impact of pension contributions on the sponsor's investment to include an examination of the stock market evaluation of such contributions. He argues that the market reaction to the reduction in the firm's cash flows as a result of MC depends on whether the sponsor was constrained from making value creating investments (the underinvestment problem) or restrained from making value destroying investments (the overinvestment problem). The market may view the former as negative news indicating that the announcement period returns are likely to be negative but view the latter as positive news suggesting that the returns are likely to be positive. Thus the market reaction would be conditioned by its view of the sponsor firm's investment opportunities, the financial constraints leading to underinvestment and the corporate governance system that can restrain it from value destroying overinvestment and negative NPV investments e.g. empire-building acquisitions. For a large sample of DB sponsoring US firms some of which are subject to MC requirement, Franzoni finds evidence consistent with the above propositions i.e. the shareholder returns are negative to financially constrained firms and positive to corporate governance-weak, overinvesting firms. The major implication of this study is that the market interpretation of pension fund deficit and any mandatory contribution is conditioned by its perception of whether the firm is capable of making value additive capital investments. Since acquisition is generally a major capital expenditure for a firm, any market reaction to takeover announcement or post-acquisition performance is likely to reflect such market interpretation. Moreover, takeovers have been driven by overconfident CEO's empire-building proclivities (Sudarsanam, 2010, ch. 12).

Another study which finds a link between pension funding status of a DB scheme and the investment behaviour of its sponsor is by Aldersen and Betker (2009) who examine the investment behaviour of DB sponsor firms during 2000-02 when the 'perfect pension storm' broke. This storm was

characterised by the collapse in the value of pension assets following the collapse of the stock market and the simultaneous decline in bond yields which massively increased the current value of the pension scheme liabilities. Many DB schemes changed from being overfunded due to the more benign asset prices and bond yields of earlier times to being substantially underfunded. Aldersen and Betker examine whether this transition led sponsor firms to prefer capital investment that generated more near-term cash flows rather than higher returns over the longer term i.e. investments with shorter payback but also lower returns. The authors characterise the foregone value due to such suboptimal investment behaviour 'distortion costs' (p258). For a sample of 125 multi-segment US firms surrounding the perfect storm during 1999 to 2005, the authors find that firms that experienced a sharp reversal in funded status allocated capital expenditures to segments with higher cash flows after the event when compared to before' (p259). Thus pension funding status and the financial constraint it causes sponsor firms seem to influence the capital investment characteristics. While the authors do not explicitly consider capital investment such as acquisition in this context, it is a reasonable inference that pension fund status and the financial constraint it imposes are likely to affect the acquisition quality and the value of such acquisition to shareholders.

Phan and Hegde (2013) consider the impact of sponsor firms in the US freezing their DB schemes and switching to DC schemes on the sponsors' liquidity, capital investment and market value. Freezing DB schemes should relieve the pressure on liquidity and the constraint on investment thereby enhancing firm value. They find for a sample of 1071 US firms of which 179 froze their DB plans during 2001 to 2008 that MCs depress investment but 'little evidence that the shift from DB to DC plans improves corporate investment in a significant way over the following three years. MCs also lead to decline in shareholder value albeit much smaller than the decline reported by Franzoni (2009) in his study cited above. Phan and Hegde take into account that the decision to freeze DB plans and switch is endogenous to the firms' liquidity, leverage and investment decisions and their models allow for such endogeneity. This line of reasoning suggests that acquisition decisions of sponsor firms are endogenous to their pension plans and the funding status of these plans.

 Similarly the payment currency decision which is also a capital structure decision is endogenous to the pension plan decision since a DB plan has different implications for the acquirer's capital structure from a DC plan and the decision about the type of pension plan to acquire (as part of the target acquisition) and the decision about the payment currency are jointly determined.

A target with an overfunded DB plan has different implications for the post-acquisition capital structure of the acquirer and hence its acquisition financing choice from an underfunded DB plan. A DB plan has different implications from a DC plan. The joint determination of the choice of target in terms of its pension plan and the choice of payment currency which in turn influences the capital structure choice is an issue that has not been examined in prior literature.

Aldersen and Seitz (2013) explore the extent to which the investment policy and funded status of a DB scheme affects the value of corporate level investment to the firm and the value of its debt and equity securities using a Monte Carlo simulation approach. They also investigate whether changes in speed of deficit reduction mandated by the US Pension Protection Act 2006 (PPA2006) affect the firm's investment efficiency. They view a pension scheme as both a profit centre generating volatile investment earnings and a senior claimant with a contribution stream that is senior to the debt service obligation of the sponsor. Their simulation results indicate that 'shareholder gains … are influenced by the asset allocation of the pension assets, the funded status of the plan and the degree of financial leverage employed by the plan sponsor'.

In Aldersen and Seitz (2013), the sponsor's capital investment decision is influenced by the debt overhang associated with an underfunded DB plan. Myers (1977) in his classic paper identified the debt overhang and its incentive or disincentive for corporate investment. Where there is debt overhang, incremental value created by an investment may be pre-empted by the DB scheme before accruing to the sponsor's shareholders. This creates a disincentive for shareholders to make value creating investments. On the other hand, there is also an incentive for shareholders to make high risk investments i.e. to go for broke since in a limited liability context, the debt holders will bear the cost of investment failure whereas the shareholders will reap the benefit of a very successful project after the debt holders' claims are paid off. Where the pension benefits of DB schemes are guaranteed and the sponsor can transfer an underfunded plan to a body such as the Pension Benefit Guaranty Corporation (PBGC) in the US or the Pension Protection Fund (PPF) in the UK, the sponsor has even greater incentive to undertake high risk investments. This option to default on pension liabilities is valuable to the sponsor and provides an incentive to undertake high risk investment of pension fund assets as well as high risk corporate investment. This creates a moral hazard problem for the guarantor. A mandatory contribution requirement under the PPA2006 or the Contribution Notice (CN) or Financial Support Direction (FSD) under the Pensions Act 2004 (PA2004) in the UK are statutory instruments to deal with such moral hazard. We describe these moral hazard powers below.

Andersen and Seitz argue that mandatory contributions required under the law improves the funding status of DB schemes and reduce the reliance of the scheme on the value outcome of corporate investment. This enhances the incentive for the sponsor to undertake value additive corporate investment without fear of expropriation of such value by the pension scheme creditor. Since the PPA2006 gave more powers to require MC, the US sponsors' incentive to make investments increased after the introduction of that law. Andersen and Seitz demonstrate that 'the incentive of shareholders to invest is shaped by the extent to which pension liabilities are funded and by the investment mix of assets in the pension fund' (p415). They conclude that 'pension policy can affect the extent to which the value of the project is shared with the pension fund at the expense of the shareholders' (p415). An implication of this study is that target pension scheme status may affect the riskiness of the acquisition financing choice made by the acquirer.

Franzoni and Marin (2006) examine whether the stock market prices the underfunding of pensions in DB schemes disclosed in the company's financial statements and the consequent rise in pension obligations in the valuation of the sponsor's equity and its returns. They find significant evidence of overvaluation of such firms and of low returns to the most underfunded firms. This suggests that the true financial risk of underfunding is not realistically factored into investors' valuation of such firms. Franzoni and Marin (2006) conclude that investors are not 'paying enough attention to the implications of current underfunding for future earnings and cash flows' (p953) disclosed in the sponsor's corporate financial statements, pointing to some inefficiency in market valuation of underfunded firms.

The foregoing review emphasises the role played by pensions law and the regulatory system established under such law. In the next section we describe the legal and regulatory framework in the US and UK.

3. Pension laws and regulations

3.1 US pension law and regulation[1]

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[1] This section draws on Aldersen and Seitz (2013), appendix

In the US employers sponsoring pension schemes for their employees have statutory obligations in addition to obligations laid down in the trust deeds and rules of the schemes. Minimum required annual contribution to a pension fund plays a crucial role in determining how much cash flow is available for bank lenders, bondholders and stock holders. Priority for distribution of sponsor's operating cash flow:

- Pension fund
- Bank debt
- Bond holders
- Stockholders

Minimum annual contribution (MAC) is laid down by PPA2006. It consists of two components: 1. to fund benefits accruing in the current period and 2. to amortize any unfunded pension liability, the difference between funding target and value of pension assets. The funding target is the present value of pension benefits that have been earned. The funding shortfall has to be amortised over a maximum of 7 years.

Further, the sponsor is required to make additional contributions during the years in which the plan is deemed to be 'at risk', which happens when the funding ratio i.e. the actuarial value of the plan assets to the accumulated benefit obligation is less than 80%. The sponsor of a plan at risk has to contribute an additional $700 per plan participant plus 4% of the sum of the funding target and normal cost. Thus when the plan falls into 'at risk' territory, the sponsor's cash flow commitment to the plan becomes larger and increases its financial constraint on its operations and investments.

Funding requirement under pre-PPA2006 law in the US

The minimum funding requirement under previous law consists of 3 separate components:

1. The normal cost of the plan;
2. 5-year amortisation of experience gains and losses i.e. losses (gains) when pension assets perform below (above) expectations thereby widening or narrowing the funding deficit;
3. A funding waiver amortised over 5 years.

Where the plan is severely underfunded, the minimum funding requirement is replaced by the deficit reduction contribution (DRC). The DRC is based on funded current liability (FCL) equal to current liability/ actuarial value of pension assets. Current liability is the present value of the accumulated benefit obligation i.e. equal to the funding target. The DRC is based on a formula which results in the funding deficit being amortised, over a period of 3 to 5 years in practice.

Value of the tax shelter provided by pension plan contributions

Since contributions to a pension scheme are tax deductible, the sponsor can shelter its earnings against corporation tax through these contributions. To prevent pension fund contribution as a tax avoidance device, the PPA2006 imposes a maximum limit on such contribution in a year, limited to an amount that would cause pension fund assets to exceed 150% of the accumulated benefit obligation. There is also a provision for waiver of the minimum contribution if internal finance of the sponsor is inadequate. Pre-PPA2006 law also allowed the sponsor to receive funding credits for excess contribution above the minimum required which can offset the minimum required in future years.

3.2 UK pension law and regulation[2]

The Pensions Act 2004 (PA2004) came into effect in April 2005 and governs the operation of occupational pension schemes (OPSs), most importantly the DB schemes. Prior to PA2004, pension schemes were regulated by the Occupational Pension Regulatory Authority (OPRA) under the Pensions Act 1995 (PA1995). PA2004 was amended by Pensions Act 2008 (PA2008). PA2004 set up the Pensions Regulator (TPR) who monitors occupational pension schemes and ensures compliance with the pensions laws and ensures that the interests of pension scheme members are protected.

TPR also operates the Pension Protection Fund (PPF) established in April 2005 to compensate members of DB pension schemes when the sponsoring employer is insolvent and leaves unfunded liabilities in a pension fund that commences winding up after 5 April 2005.

TPR has wider and more proactive powers than the OPRA to

- impose contribution rates in the absence of agreement between the scheme's trustees and the employer;
- investigate schemes and freeze them while investigating; and
- direct employers, trustees and others to take certain steps.

TPR also has 'moral hazard' powers to direct employers and 'connected or associated parties' of the employer to make contributions to underfunded DB schemes (see below on 'moral hazard' powers).

An OPS runs on the efforts of three stakeholder groups: the employer, the trustees and members. A scheme or plan is generally established under a trust which is responsible for providing the benefits to the members. The employer, however, has the obligation to fund the scheme adequately to enable it to pay the benefits to its members. Trustees may be individuals or corporate. The trustees must exercise their powers under the trust in the best interests of the beneficiaries. Trustees may often face a conflict of interests between their duty to the members and their role with the employer.

In addition to the duties and powers under the scheme specific trust deed, trustees may derive duties and powers under the general trust law and specific pensions law. These can override the provisions of the trust deed.

Funding of DB schemes in the UK

UK OPS in general are contributory schemes to which both employees and employer contribute at specified contribution rates e.g. a fixed percentage of salary (in non-contributory schemes employees do not contribute). The employer's contribution is determined by a combination of the scheme rules and statutory requirements that can override the scheme rules. The amount of contribution depends on the scheme's funding position or status i.e. whether its assets cover its liabilities or exceed them. Since the value of these assets and liabilities depends on the valuation in securities markets, debt security yields, expected inflation, expected final salaries, members' longevity etc the funding status and the required contribution can vary over time.

Over time the valuation basis of a pension scheme's liabilities has changed from an accounting basis e.g. based on the Financial Reporting Standard (FRS) 17 to a buy-out basis. The latter is the cost to an insurer of buying out the scheme and accepting its liabilities and providing annuity policies to match

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[2] This section draws on Pollard et al (2014) and the various publications available from the UK Pensions Regulator's website at http://www.thepensionsregulator.gov.uk .

the benefits under the scheme. The buyout basis tests whether there would be sufficient assets to secure the scheme's liabilities if the scheme were wound up.

A trustee-appointed actuary needs to assess the funding position of the scheme periodically. The actuary values both the liabilities and assets of the scheme using a variety of demographic and economic assumptions e.g. mortality rates, future inflation, future pay increases and interest rates. Under the pensions law, funding valuations and ongoing contributions will be agreed between the trustees and the employer. In the absence of an agreement TPR can specify what should apply. Trustees have to prepare periodically a schedule of contributions from the employer which must be certified by an actuary showing the contribution rates for employers as well as for members and the due dates for such contributions. Penalties for non-compliance with the schedule may be imposed.

Where there is a funding surplus, a contribution holiday i.e. reduction or suspension of contribution is possible. However refund of surplus to the employer is permitted only in very restricted circumstances and is subject to high tax rates. While persistent pension fund surpluses and contribution holidays were common in the stock market boom years of the 1980s from the 1990s onwards, fund deficits and mandatory contributions have become most common.

Pension fund investments

While trustees and the investment managers appointed by them have much freedom in the UK, they have to exercise their powers to ensure the '*security, quality, liquidity and profitability' of the pension fund portfolio*'. The trustees are required to produce a statement of investment principles (SIP) setting out their investment policies and their attitude to risk and must also appoint an investment manager to manage the investments. The employer may not be able to dictate the fund's investment strategy. Following the Myners Review of Institutional Investment (2001) there is a code of best practice for managing the fund's investments. Registered pension schemes enjoy tax-free growth on all investment returns.

Scheme funding requirements under PA2004

PA2004 sets out the framework for determining how employers must fund their DB schemes. This requires valuation of the pension assets and pension liabilities. Such a valuation is generally different under the UK's accounting standards, FRS 17/International Accounting Standard 19, from that under PA2004's Scheme Specific Funding (SSF) regime. The two valuation bases may differ in terms of discount rates used for discounting pension liabilities and in demographic assumptions e.g. about life expectancy of scheme members. Whereas trustees should make 'prudent' assumptions for SSF in choosing the actuarial and mortality assumptions and the discount rates, accounting standards stipulate 'best estimate' assumptions. Thus accounting-based estimate of the scheme's funding deficit may not be a reliable indicator of the SSF on a buy-out basis under the law.

Actuarial valuations and recovery of fund deficit

Actuarial valuations must be prepared at least every three years, on a basis consistent with the scheme's Statement of Funding Principles (SFP) and annual reports. These valuations must contain the actuary's certification of the funding and the scheme's solvency. Trustees must also provide an annual actuarial report in the intervening years. Where the valuation shows deficit, trustees must put in place a deficit recovery plan. While trustees would like a short recovery duration, they may accept a longer period in agreement with the employer taking into account the latter's financial condition.

Trustees must also prepare and send to TPR a recovery plan. Depending on the trustees' powers under the trust deed, they may have to obtain the consent of, or consult with, the employer as regards the

recovery plan and the schedule of employer contribution. Where the trustees and the employer disagree the TPR may give directions as well as impose a schedule of contributions.

Corporate transactions and the SSF

The trustees may have the power to intervene in takeover bids depending on their powers under the trust deed. They may demand that any fund deficit be paid in full or require higher employer contributions in future. This can jeopardise the deal. Employers have a legal duty to inform the trustees of material events such as a takeover bid for the employer.

TPR and regulation of scheme funding

In addition to its general review role in relation to scheme funding, TPR can impose a scheme funding plan when trustees and the employer fail to agree. In practice, TPR is a 'referee and not a player' and seeks to facilitate rather than impose a funding solution. In its 2008 statement, TPR emphasised the importance of the viability of the employer and its sustainable growth to the members of a scheme. TPR must therefore have regard to the effect of any funding plan on the employer's financial condition and growth prospects. Among the principles guiding TPR's intervention are protecting members' interests, a risk-based assessment and a proportionate approach. It is more preventive than reactive to scheme failure. In the event of contribution failure by the employer without reasonable cause, TPR can impose a penalty.

Surplus in overfunded DB schemes

Whether a DB plan is overfunded and in surplus depends on the valuation basis used. Pension assets which are generally market-traded securities like equity and bonds are based on market values. Pension liabilities are however far more difficult to value and need to take into account factors such as the discount rate, anticipated life expectancy, mortality rates, future evolution of salary and relevant employee benefits and the size of the membership. The accounting standard FRS17 uses the AA corporate bond rate as the discount rate for pension liabilities whereas TPR uses actuarial valuation and the buyout basis. In general, the FRS17 valuation can be much higher than the buyout basis thereby understating pension deficits and overstating the pension surplus relative to the latter.

Pension fund surplus can be refunded to the employer but it is subject to very restrictive rules. It has to be permitted by the scheme's deed and rules. PA1995 allows refunds only when the surplus is on a buyout basis and after due notification to members and the TPR. A refund will attract a tax charge.

Section 75 debt under PA1995

A debt under s75 can arise in a variety of circumstances such as reorganisation or business sale leading to an employment cessation event (ECE). The DB scheme sponsor then may be required to make a large lump sum contribution to the scheme. It may become liable for all or some of the funding shortfall. This has consequences for the buyer of a company which ceases to be the employer since the buyer may face a s75 liability and this is likely to increase the cost of purchase.

Moral hazard powers of TPR

Under PA2004, TPR has wide powers to make third parties connected with an employer liable to, or support, an underfunded DB scheme. It can issue a contribution notice (CN) or financial support direction (FSD) using those powers which are aimed at discouraging use of any corporate structure to avoid the employer's pension liabilities. This includes entering material transactions without taking into account the potential impact on the scheme. The powers also enable TPR to monitor and prevent the risk of employers transferring their pension liabilities to the Pension Protection Fund (PPF). TPR's

powers only apply if the scheme potentially falls within the PPF or is one to which s75 employer debt obligation can apply. The liability covered by a CN or FSD is towards a scheme deficit defined on a buy-out basis which can be much larger than on the FRS17 basis.

Clearance from moral hazard powers

If a transaction such as a company purchase is likely to have a materially detrimental effect on a DB scheme's ability to meet its liabilities, it is safe for the concerned parties to apply for a statutory clearance from TPR. Obtaining clearance reduces the transaction risk but is voluntary. TPR is generally willing to give clearance where parties provide adequate support to the pension scheme to mitigate the detrimental effects of the transaction. The terms of mitigation may be agreed between the trustees and the employer or the third party but TPR will rigorously evaluate the agreement e.g. if the transaction results in a highly leveraged employer, TPR may insist on strong mitigation such as cash payment to the scheme that avoids the investment risk of volatile returns. The degree of leverage is a key factor that TPR will take into account. Trustees may also insist on the employer obtaining clearance since it gives trustees greater assurance and reduces the risk of being held in breach of their duties to the scheme. Highly leveraged mergers or buyouts are more likely to pose detriment to a pension scheme and hence more likely candidates for clearance application which must be backed by strong mitigation proposals.

Seniority of pension scheme as a creditor of the employer

Pension obligations rank as a creditor to the employer. The funding obligations of the employer are both under the trust deed and under the pension's law. These obligations are in general unsecured and non-preferential creditors in insolvency. The scheme is behind creditors with fixed charges, insolvency expenses, preferential creditors and creditors with floating charges and rank along with other unsecured creditors. Some pension claims e.g. employee contributions collected but not paid into the scheme may count as preferential debt but the amounts are in general limited.

The Pension Protection Fund (PPF)

PPF provides a safety net for eligible OPS in the event of insolvency of the sponsor. During an initial assessment period the PPF assesses the scheme's viability and whether it can be rescued. If a rescue is not possible, the scheme enters the PPF to which all the scheme's assets and liabilities are transferred. The PPF provides compensation at a protected level of benefits to DB members who are eligible depending on the circumstances of each member e.g. whether retired, divorced etc. The PPF is funded by a levy on DB schemes by reference to the number of members they have. It has two components:

1. A flat rate levy and
2. a risk-based levy determined by reference to scheme's funding level, its investment profile and the sponsor's financial condition.

The size of the levy is thus a good indicator of the scheme risk as perceived by PPF.

3.3 Pension law and regulation impact on takeovers

Pension schemes have the potential to be deal breakers and hence have been regarded as part of the target's defence against a hostile takeover i.e. a 'poison pill'. In the case of a public company takeover

bid, the transaction will lead to a share sale of the target which will generally also be the principal employer. The pension scheme will therefore go with the target firm to the buyer. The buyer and seller have to take into their valuation the funding position of the scheme and any deficit or surplus may be reflected in the purchase price. An alternative to price adjustment is the provision of funding indemnities to enable the transaction to be completed while the valuation is done subsequently. Where the buyer contemplates post-acquisition restructuring, it needs to consider the impact of such restructuring on the acquired pension scheme and whether it may lead to a s75 debt or the TPT issuing a CN or FSD using its moral hazard powers.

Communication obligations of the sponsor

An employer is in some cases legally obliged to disclose information about a proposed transaction to the pension scheme trustees or members or to TPR. The disclosure may have to be made before completion of the transaction. Where the employer is seeking clearance from TPR for a transaction the trustees will have to be involved in the process since their views will be sought by TPR and therefore disclosure to them becomes necessary. Breach of the duty to disclose may lead to penalties imposed by TPR.

The City Takeover Code

Various articles of the Code require notification of, and consultation with, employee representatives of the offeree company on matters that will impact on employees. In 2013, the Takeover Panel extended the provisions to the trustees of the offeree company so that they can express their views. The Code does not require the trustees' agreement to the future funding plans for an offer to become unconditional but the new provisions will allow the effects of the offer on the offeree's pension scheme to be taken into account.

The bidder is required to provide the pension trustees of the target's DB schemes financial information about itself, details of how the offer is being financed and disclose its intentions regarding employer contributions to the scheme. The bidder will be held to account for its statements for a 12 month period unless specified otherwise or there is a material change in circumstances.

Under the Code, the trustees have the right to offer their opinion to the target board of directors on the effects of the offer on the pension scheme and to have this opinion appended to any circular issued by the target. The trustees, however, cannot block a bid. An offer cannot be made conditional on agreement with the pension scheme trustees or clearance from TPR.

Pension fund investment

Investment of the fund is the responsibility of the trustees and the fund manager appointed by them. While trustees derive their investment powers from the trust deed, legislation also has important provisions on the conduct of trustees, the management of the investments, consultation with employees, trustees' and fund manager's duties etc. Assets of the scheme must be invested in the best interests of the scheme's beneficiaries. There are also restrictions on borrowing and use of derivative securities by the fund. A scheme can invest only up to 5% of the fund in employer (or associate)-related investments and cannot make any employer-related loans (PA1995).

Trustees must consider the impact of the investments on the employer since the employer is a residuary beneficiary on the winding-up of the scheme. They must take into account the employer's investment recommendations so as to retain the employer's goodwill in the best interests of the scheme members and since the employer is a quasi-beneficiary. The employer has a financial interest

in the fund performance since its future contributions may be affected by it. However, the employer's consent to the trustees' investment powers is not required.

4. Impact of legal and regulatory requirements on assessment of transaction risk, takeover premium and choice of payment currency

From the foregoing description of the legal and regulatory framework of pension schemes, in particular DB schemes, it is clear that they pose both transactional risk and long term financial risk to the buyer. They are therefore likely to impact on the pricing of the takeover bid i.e. the takeover premium and the way the bidder seeks to manage the long term financial risk. Long term risk management strategy would include a judicious choice of the payment currency since it is well recognised as a risk management tool (Barbopoulos and Sudarsanam 2012).

Assessment of the target firm's pension funding risk in the UK takeover situations is helped by the triennial valuation of the scheme and the annual reports prepared by the trustees. Where the bidder obtains TPR clearance with the support of the trustees, information asymmetry between the bidder and the target is reduced and reliability of the risk assessment process is further improved. Nevertheless substantial risk is likely to remain and has to be factored by the bidder into its deal pricing and financing strategies since the actuarial valuation of a pension scheme's assets and liabilities is not free of uncertainty and risk. In general therefore the higher this risk the lower are the offer price and the bid premium offered to the target shareholders.

Given the risk attached to the pension scheme inherited from the target, a stock exchange offer is more likely to mitigate the risk than a cash offer. Since the pension scheme liabilities will add to the acquirer's liabilities thereby raising its financial leverage, financing the offer with a cash offer funded by issue of the bidder's debt or making a loan stock offer is likely to compound the acquirer's financial risk. A stock offer on the other hand enables risk sharing between the acquirer and target shareholders. The financing decision is therefore part of the acquirer's capital structure decision.

Pensions and corporate capital structure

Shivdasani and Stefanescu (2010) examine the implications of a DB pension scheme sponsored by a firm for its capital structure. Given that pension fund liabilities rank as creditor to the firm and the firm has a legal obligation to fund any funding deficit under the pension's legislation, the overall financial risk of a firm is a function of both its corporate borrowing and the pension liabilities. Thus the true leverage of the firm is not revealed unless the pension liabilities are taken into account. Shivdasani and Stefanescu (2010) treat the pension plan as a fully owned subsidiary of the firm and calculate the consolidated (pension and financial debt) leverage ratios. They argue that securities markets value pension plan assets and liabilities as corporate assets and liabilities. Credit rating agencies factor in pension liabilities and funding obligations in their assessment of corporate financial risk and rating of debt issued by the sponsor firms. The equity market's estimate of the sponsor's systematic risk i.e. asset or equity beta is a function of the pension scheme liabilities and assets as shown by Jin, Merton and Bodie (2006).

As in the case of corporate borrowing, pension contributions made by the sponsor are also tax deductible. Thus the tax benefits of pension contributions are likely to be traded off against the risk of the pension liabilities in the same way that firms trade off the tax benefit of corporate debt against

the risk of leverage[3]. Sponsors may also trade off pension fund debt against corporate debt. Where the pension fund leverage is high the corporate leverage may be kept relatively low so that the consolidated leverage is within what the sponsor may consider a prudent level. This also suggests that corporate leverage and pension fund leverage are jointly determined and are endogenous decision variables. Further when the pension liabilities are ignored the observed leverage ratios of firms are likely to be low and far below what may be the optimal levels and the observed tax benefits of leverage are lower than the true benefits.

Shivdasani and Stefanescu (2010) find that pension liabilities are a significant determinant of corporate capital structure. For Compustat firms in the US with DB schemes both book and market leverage ratios are about one third larger on a consolidated basis with book leverage increasing by 25 to 34% and market value leverage by 20 to 27%. When pension liabilities are consolidated, US firms' leverage ratios are not as inefficient and suboptimal from the tax advantage of debt perspective as have been argued by some prior studies (Graham, 2000 and Graham and Harvey, 2001).

Pensions and the sponsor's cost of capital

Since leverage has a positive impact on the equity beta of the firm, pension fund liabilities which increase the firm's leverage are expected to have a positive impact on the sponsor firm's equity beta and its cost of equity. The pension fund assets are also expected to impact on the asset beta of the sponsor. Jin, Merton and Bodie (2006) examine whether the risk of their pension plans is reflected in the CAPM equity beta of the sponsors. It is possible that the pension liabilities are not so reflected for a variety of reasons e.g. due to the opacity of information in financial accounting statements about pension fund liabilities and assets. These are also off-balance sheet. Pension accounting rules are complicated. The role of PBGA which guarantees pension benefits may also cloud the relation between pension plan risk and sponsor equity risk. The empirical findings of the study are consistent with the hypothesis that firm equity risk does reflect the pension plan risk, consistent with an informationally efficient capital market.

Bidder and target pension schemes and choice of payment currency by bidder

Several studies have modelled the payment currency choice for takeovers from a theoretical and empirical perspectives. Other studies have examined the shareholder value impact of the payment currency choice. In general cash offers create more value for both bidder and target shareholders in both short and long term (Sudarsanam, 2010, ch 16). A range of factors has been proposed in theoretical models and in empirical tests to explain the payment currency choice. These factors include information asymmetry between bidder and target in valuing each other's securities being offered, the prior leverage of the bidder, its liquidity constraints, its growth profile etc. In this study we take into account those factors identified in prior studies but our focus is on pension assets and liabilities of both the target firms and bidder firms. Payment currency choice is also likely to be dictated by the bidder's current leverage and the projected leverage after acquisition of the target. Where the bidder or the target is already highly leveraged, the bidder may find it expensive to borrow to finance a cash offer or offer loan stock as a currency. In that situation the offer may be a stock exchange offer. Thus *a priori* we can expect the leverage levels of bidders and targets to influence their choice of payment currency.

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[3] There is an incentive for the sponsor to make excessive pension contribution and over-fund the pension scheme to take advantage of the tax benefit. Tax rules may treat this as tax-avoidance and disallow excessive contribution.

Faccio and Masulis (2005) empirically examine the payment currency choices for a large sample of European bidders for publicly and privately held targets during the 1997-2000 period. They model the proportion of cash in the payment method offered by the bidders as a function of the collateral value of the firm's assets, financial leverage, firm size, relative size of the deal, bidder shareholder returns in the run-up to the bid, market to book value, deal value and the market return in the run-up to the bid in the bidder's country, liquidity and return volatility of bidder's stock, and bidder's working capital. Given that the payment currency has implications for the ownership and control that the bidder will hold post-merger e.g. cash purchase means total control of the target whereas stock exchange means control is shared with target shareholders, the authors include a number of variables to represent ownership and degree of control, voting rights etc. Their explanatory variables also include bid characteristics such as hostile or friendly, prior bid financing, tender offer or merger etc[4].

Faccio and Masulis (2005) employ two modelling approaches. They model the proportion of cash in the payment mix as a dependent variable in a Tobit model and the categorical variables – stock, cash or mixed currencies – as dependent variables in an ordered Probit model. They also consider the self-selection bias in their model and any bias in the estimates of Tobit and Probit regression coefficients. This bias arises from the proposition that firms' takeover decision may depend on factors that affect the payment currency choice e.g. dilution of control in a stock exchange offer. Therefore firms seeking to avoid such a loss may not make a bid or make only a cash bid. To assess the impact of this self-selection and endogeneity bias the authors first estimate a Probit prediction model of a takeover bid. Then in a two-step procedure following Heckman (1976 and 1979) they calculate the inverse Mill's ratio and include this variable in the second-step model to explain the proportion of cash as payment currency. Since the inverse Mill's ratio is insignificant, the authors conclude that their model of the payment currency is robust to any self-selection bias.

Faccio and Masulis find that bidder financial condition and corporate control concerns influence M & A financing choices. In particular, the collateral value, financial leverage and asset size are strongly significant variables. Cash financing is more likely when the bidder has access to bank borrowing through interlocking directorship. Stock financing is less likely for private targets and for targets which are subsidiaries. Several bids characteristics and bidder and target characteristics also influence the payment currency choice. In particular, bidder's prior leverage and ability to access bank borrowing are important determinants of payment currency in European takeovers.

4.1 Pension plan assets and liabilities and payment currency choice in takeovers

Faccio and Masulis (2005) models do not include pension fund characteristics and pension fund assets, liabilities or deficits among the explanatory variables. Since, as observed by Shivdasani and Stefanescu (2010), pension plan assets and liabilities are a significant component of the overall leverage of the sponsors, it can be expected that they will influence the payment currency choice. However, there is only one study so far that has examined this proposition empirically.

Cocco and Volpin (2013) test whether DB pension schemes with their associated uncertainties in the valuation of their sponsors' pension liabilities deter potential takeover bids and, conditional on such bids, whether such schemes reduce the chances of successful bids. They examine these issues using, for the first time, a sample of UK takeover bids during 2002 to 2008. They hypothesise that target companies operating the pension schemes have an information advantage about the real value of the

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[4] Not surprisingly, given the study's focus on a European sample, the list of variables includes country-specific characteristics e.g. the country's legal tradition. Since our study focuses on a UK sample, we do not include such country specific variables.

pension assets and liabilities and true level of pension funding deficits and that the bidders suffer from, and are deterred by, this information asymmetry. As a consequence, targets with DB schemes are less likely to become takeover targets and less likely to be acquired in the event of a takeover bid. They find evidence in support of their hypotheses.

Cocco and Volpin (2013) also argue that bidders operating DB pension schemes have an information advantage in assessing the true pension liabilities compared to target firm shareholders. Given this information asymmetry, target shareholders will be unwilling to accept a stock exchange offer from the bidder and would prefer a cash offer. They model this payment currency decision and find evidence consistent with this proposition. They also report that acquirer shareholders experience negative announcement period (over -2 to +2 days surrounding the bid announcement day) abnormal returns where the bidder's pension scheme is in deficit but positive returns when a cash offer is made by bidders with DB schemes in deficit. The authors argue that these results are consistent with target shareholders' demanding a higher price from bidders with DB schemes and lower price when such bidders reduce their information disadvantage by offering cash. However, the impact of the target's DB scheme in deficit or the cash offer from the bidder has little effect on the announcement period returns to the target shareholders.

Cocco and Volpin's proposition that the sponsor of a pension scheme has an information advantage over the bidders as regards the true value of the scheme assets and liabilities is debatable. As described in the section above on the pension laws and regulations in the UK, pension fund investment is the prerogative of the fund trustees and the investment manager appointed by them. The sponsor has a limited role in managing the fund investment. Moreover, the fund assets and liabilities are valued by independent actuaries to the fund for the purpose of determining the funding short fall and the contribution level although the latter is subject to agreement between the sponsor and the trustees. The actuarial valuation has to be done triennially and the trustees have to file an annual report in the intervening years. Information about fund valuation, asset value, liability value and funding shortfall is therefore in the public domain limiting any information advantage to the scheme sponsor.

Cocco and Volpin's modelling of the payment currency decision by the bidder and the announcement period abnormal returns controls for either the bidder's DB scheme deficit or the target's DB scheme deficit and not both whereas both schemes are relevant and likely to impact on the riskiness and pricing of the takeover bid. In their model of payment currency offered by the bidder they take into account the bidder's DB scheme deficit and not the target's. To assess the impact of schemes in a takeover context, it is more logical to take into account the schemes of both bidder and target.

Further, it is necessary to take into account both the pension scheme assets and liabilities i.e. the size of the pension scheme and not just the deficit. Shivdasani and Stefanescu (2010) argue that since securities markets value pension assets and liabilities as corporate assets and liabilities for the purpose of assessing the corporate leverage and the associated credit rating for the sponsor and its debt securities. They consider that considering only the net liability of the pension scheme i.e. the pension deficit is likely to understate the corporate leverage. They cite S & P's view that 'the size of the gross liability is also important because, where the gross liability is larger relative to the company's assets, any given percentage change in the liability or related plan assets will have a much more significant effect than if the gross liability had been less substantial' (p10). Thus an appropriate way to calculate the consolidated leverage measure is to take into account the plan assets as well as plan liabilities as would be done in the consolidated accounts of the sponsor with a fully owned subsidiary.

In our study we model the payment currency decision and the shareholder value effects of the takeover and the payment currency choice. We focus on the pension assets and liabilities of both the bidder and the target among the explanatory variables.[5]

4.2 Hypotheses for testing

From the foregoing literature review and the review of the pension's law and pension's regulatory framework it is clear that the target company pension scheme is likely to have a significant impact on the attractiveness to the bidder of making a bid for the target and the takeover premium to be offered. Further, the target's pension scheme is likely to influence the choice of payment currency for the takeover. The optimal payment currency will depend on the riskiness of the target pension scheme to the bidder. An optimally chosen payment currency is likely to add value to the bidder shareholders as well as to the target shareholders.

Following these arguments we set up the following hypotheses:

H1: A high risk target pension scheme i.e. a DB scheme will lower the takeover premium paid by the bidder to target shareholders relative to a less risky scheme like DC;

H2: The target pension scheme's riskiness is negatively related to the bidder's willingness to pay with 100% cash or with a high proportion of cash in its payment currency mix and positively related to 100% stock exchange or with a high proportion of bidder's stock in its payment currency mix;

H3: Bidder's shareholders will experience more positive announcement period returns when the payment currency is appropriate for the target pension scheme risk than otherwise.

5. Methodology

5.1 Modelling payment currency choice

The choice of payment currency is a function of a range of variables as indicated in our literature review. In choosing its payment currency, a bidder is likely to have regard to the riskiness of the target including the riskiness of its pension plan. A wrong payment currency may compound the riskiness of the acquisition to the bidder thereby eroding the expected value creation from the acquisition. In assessing the riskiness of the acquisition, the bidder needs to take into account the riskiness of the target's pension scheme, target's non-pension scheme related risk profile, its own pension scheme risk profile, its own non-pension scheme related risk profile and the resources available to manage the overall risk post-acquisition. The payment currency choice is therefore a decision jointly made with the decision to acquire a particular target given its risk profile. Thus the target choice and the payment currency choice are mutually endogenous.

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[5] Other pension plan related variables that may reflect the riskiness of the plan and the impact of the pensions law and the pensions regulation in the UK. Among these are: whether the bidder/ target has received clearance for the transaction from TPR; whether clearance was applied for and not given; whether an agreement of the target pension scheme trustees has been received concerning any future funding plan; whether any of the schemes operated by either the target or the bidder has received a contribution notice of FSD from TPR prior to the takeover bid; and whether there is a recovery plan in respect of any deficit as against a funding target (see K Hughes, 'How the role of pensions in M & A is changing, Slaughter and May, London for a discussion). However, data on these variables are not publicly available and hence they are not included in our analysis.

We model the payment currency choice in one of two ways following Faccio and Masulis (2005). First, we model the proportion of cash in the payment currency mix as a function of various bidder, target and bid characteristics. Among the bidder characteristics are the bidder's own pension scheme risk characteristics and among the target characteristics are the target's pension scheme risk characteristics. We use the two-boundary Tobit estimator where the dependent variable y assumes the following values:

0% when the offer is all stock or all non-cash;

100% when the offer is all cash

The coefficients of the Tobit model are estimated using the maxiumum likelihood estimator.

The second approach is to model the payment currency choice as a trichotomous choice variable: Cash = 0; Mixed offer = 1 and stock = 2. The estimator is the ordered Probit estimator. We shall also consider a third estimator i.e. a logit model of the dichotomous choice between 100% cash and 100% stock as payment currency.

5.2. Addressing self-selection and endogeniety biases

The sample used to estimate these models is observational i.e. takeovers that have already happened and not experimental. This creates the problem of self-selection (or endogeneity) bias. This means that bidders choosing DB scheme sponsoring targets may be systematically different from those that choose targets that offer less risky schemes. Any treatment effects i.e. shareholder value gains due to payment currency choice may consequently be due to the characteristics of the specific bidder and its target rather than to the payment currency choice *per se*. In assessing the treatment effects we therefore need to control for these systematic differences among bidders and their proclivity to choose targets sponsoring specific pension schemes.

Faccio and Masulis (2005) address the self-selection bias using the Heckman two –step procedure. This procedure runs a model to predict which firms are likely to make a takeover bid and estimates the Mill's inverse ratio from this model. This ratio is then included as and additional variable in the Tobit model of payment currency. A significant coefficient would indicate self-selection bias. The authors however find that the ratio is not significant and conclude that their Tobit model does not suffer from self-selection bias.

An alternative procedure is to use the Propensity Score Matching (PSM). This involves estimating a predictive model of payment currency choice first and then matching the different groups using different currencies on their probability of using a particular payment currency. These groups when matched on their propensity score will have the same likelihood of using a particular currency. The difference in shareholder returns to bidder groups using different payment currencies (the treatment effect) can then be tested for statistical significance and the test results will be free of self-selection bias. An extension of PSM is to test for its robustness to omitted variables and the Rosenbaum Bounds (RB) can be used to test for robustness of the tests for treatment effects. I have used the PSM and RB methodologies in my paper on the choice of earnout in US takeovers and the shareholder value gains (for further details see Barbopolous et al, 2014, paper circulated to the MARC advisor group in February 2014).

5.3 Modelling shareholder value gains

We estimate the shareholder gains using the conventional cumulative abnormal returns (CAR) methodology over the period -5 to +5 days centred on the announcement day, Day 0. Abnormal return

is the excess of the return to the bidder shareholders over the corresponding return to the FTSE 350 Index. We then regress the estimated CARs on relevant variables including target pension scheme variables (see Faccio and Masulis, 2005 and Barbopoulos et al, 2014).

5.4 Data and explanatory variables

Sample

The initial sample includes all takeover bids for UK public companies announced from January 2002 to the end of December 2012. The bid announcement data are collected from SDC Platinum database. All deals satisfy the following criteria for inclusion in our sample: the initial sample includes all acquisitions announced with a set of UK data on the FTSE350 companies to examine the effect of defined benefit pension fund status on premium paid by bidder. All the target firms are UK public companies. We collected information for this set of firms, including firm financial variables, pension plan scheme status and M&A activities, over year 2002 to 2012 where year 2002 is the first year of pension data to be reported in full in the sponsoring employer's financial statement under the UK financial reporting standard FRS 17. Finally both the acquirer and the target should be publicly listed companies and any rumoured deals from our sample.

We use the SDC to collect the SIC codes for the industry classification of both the acquirer and the target and the deal value of the transaction. We estimate the bid premia over different intervals to the announcement day as the difference between the offer price and the target share price one day, one week and four weeks prior to announcement sourced from Towers Watson which offers specialist insurance and HR advisory services relating to M&A transactions. This source is more reliable than the SDC platinum as we found frequent inconsistencies in the latter dataset. A key restriction in our data collection is that the bidder stock price at the accounting year end prior to the acquisition should be known. This is downloaded mainly from DataStream. We also require data on the methods of payment and include all deals financed with cash, stock or a combination of stock and cash.

In our sample, we have 138 M&A transactions involving a FTSE350 firm where both bidder and target listed on a UK stock exchange. We collect all the financial information from DataStream and all data related to pension schemes are manually collected from company annual financial reports. We then classify each deal according to whether the firm operates a defined benefit scheme, defined contribution scheme or no scheme (No Plan or NP) at all.

We summarise the descriptive statistics of the dataset for the deal volume and value per year for the period 2002-2012. Table 1 shows a total of 138 deals that include 84 targets with DB, 37 with DC and 17 with NP schemes. It also shows the number of deals in each of the eleven years. The number of transactions peaks (at 22 deals) in 2006 and 2002, 2011 and 2012 are the only years with single digit deals. We find that year 2007 has the highest deal value which represents 44% of the overall sample

but with only 17 deals. Table 1 also shows the number and value of deals by year and pension scheme type. The number of defined benefit plans spikes when the overall deal volume reaches its peak while the deal value for the defined benefit plans spikes with the deal value of the overall sample. Although the total volume of the DB plan represents 61% of the total sample, the deal value of the DB plan represents 92% of the overall sample deal value. The number and value of the defined contribution pension plan targets reaches its peak in year 2010 which represent 64% and 73% of the respective volume and value for the sample in 2010.

Insert Table 1 here

Table 2 provides the descriptive statistics of the mean and the median of the offer price to the target stock price premium prior to the announcement. It also shows the breakdown of the pension schemes of the target. That is it shows the premium of the DB scheme, the DC scheme and the NP scheme for, four weeks prior to the announcement date per year (Table 2A), one week prior to the announcement date per year (Table 2B) and one day prior to the announcement date prior to the announcement date per year (Table 2C). in all three tables, the statistics shows that on average the both the mean and median of the premium is higher for the DB scheme than the DC and the NP schemes.

Insert Table 2 here

Table 3 Panel A reports summary statistics for the explanatory financial variables relating to both the acquirer and target firms to be in our analysis of payment currency determinants. The data are mainly sourced from profit and loss accounts and balance sheet for the year ending prior to the announcement of the deal. The appendix to this paper provides the variable definitions. On average, acquiring firms in our sample have an EBITDA equal to £179m, return on assets equal to 4.69%, return on equity equal to 12.65%, revenue of £1,280m, Market capitalisation equal to £1,804m, total assets equal to £1,192m, cash to total assets of 89% and debt to total capital equal to 37.87%. For all of these variables, the median and the number of observations are reported in the table.

Panel A also provide the breakdown by the method of payment. An interesting fact with this sample is that 47% of the bidders pay by cash only, while 19% prefer to pay by stock only and 34% have a mixed method of payments. It also shows that the average of the overall sample is mainly driven by all cash transactions for ROA, Market capitalisation, total assets and MTBV. Interestingly, cash financed deals have higher market capitalisation than all stock financed deals which is in line with both total assets and MTBV.

Panel B shows the breakdown of the financial characteristics for firms by pension plan. It compares target companies with DB, DC or NP schemes. The three pension plans differ in many dimensions. As per the first analysis although 61% of all transactions have a DB pension plan, they are on average larger in size as measured by total assets, market capitalisation and revenue. Moreover, firms sponsoring a DB plan are more levered and highly profitable (as measured by EBITDA, ROA and ROE). This is consistent with Coco and Volpin (2013) and Shivdasani and Stefanescu (2010)

Insert Table 3 here

6. Modelling the premium, payment currency choice and the performance of shareholders value – Results

6.1 Premium

In order to investigate the hypothesis of the riskiness of the target pension scheme in a takeover in relation to the premium paid by the bidder to the shareholders, we run an OLS regression. We use the premium for 1 day prior to the announcement as the dependent variable. As the key explanatory variable, we use the DB scheme of the target to test the riskiness of this pension scheme. The expectation is that the DB scheme will lower the takeover premium paid by the bidder to target shareholders. We also use several control variable such as firm size, profitability, financial leverage and relatedness of the industry of both the target and the bidder. We find that the DB scheme lowers the premium but not statistically significant. Moreover, we do find that firm size as measured by the logarithm of revenue is positive and significant. However, the more levered a firm is the less likely the bidder will increase their risk premium. These results is consistent when we use an offer price to target stock price premium of both one week and four weeks prior to the announcement date.

6.2 Basic models of choice

To test the hypothesis that target pension scheme riskiness is negatively related to the bidder's willingness to pay with 100% cash or with a high proportion of cash in its payment currency mix, we alternative methodologies. We first use the OLS to model the payment currency choice of the bidder in terms of target characteristics. We use the percentage of cash to total payment as the dependent variable. The primary independent variable is the pension scheme type, a dummy variable that takes the value of one if it is a DB pension plan and zero otherwise. We also include firm size as measured by the logarithm of revenue, the logarithm of deal value, a profitability factor as measured by Return

on total assets (ROTA), total leverage, MTBV, run up and the diversification variables. The proxy for bidder overvaluation is the bidders' stock return in the run-up to bid announcement. Such overvaluation provides bidders with an incentive to use their stock as payment currency. We calculate the run-up as the bidder's cumulative stock return over the year preceding the M&A announcement month. Finally we include the attractiveness of the bidder's investment opportunities. We expect a high market to book ratio to increase a bidder stock's attractiveness as M&A considerations. Jung, Kim and Stulz (1996) find that bidders with high level of MTBV are more likely to use a high proportion of stock and less cash to finance the acquisition. MTBV is defined as the market value of equity plus book value of debt over the sum of book value of equity plus book value of debt prior to the bid.

Table 5 presents the results of the OLS regression. We find that the model support the hypothesis that target pension scheme riskiness is negatively related to the bidder's willingness to pay by cash. Target DB scheme has a significant negative relation to the use of cash and a significant positive relation to the use of stock. This is consistent with our hypothesis H2. We find that the larger the deal value as measured by the logarithm of deal value the less cash is used as the method of payment by the bidder pointing to risk avoidance. The indicator for horizontal merger i.e. both the acquirer and the target being of the same industry is positively related to the cash payment. The run-up in the bidders' stock price has a negative although non-significant effect on cash financing. We also find that firms which are more profitable are more likely to use cash consideration as their method of payments. Bidder's growth opportunity as measured by MTBV is insignificant.

Insert Table 5 here

We next model the bidder's choice of cash as the only payments currency and run a logit regression. The dependent variable is a dichotomous variable assuming a value of 1 when the payment currency is 100% cash and 0 otherwise. The set of explanatory variables is the same as in table 5 with the presence of DB scheme as the variable of primary interest. Table 6 presents the results of the logit regression. Once again, the coefficient of the DB scheme is negative and statistically significant. This confirms the preceding result that bidders seeking to buy targets with the more risky DB scheme prefer to offer non-cash currencies to cash. Cross-industry has a weakly significant positive impact on the choice of cash suggesting that bidders in diversifying mergers are less risk averse and are willing to offer cash.

Insert Table 6 here

Since defining cash or stock as a proportion of the M&A consideration in Table 5 means that the variable is bounded on both the upside and the downside, we next employ a two-boundary Tobit

estimator. We follow the same methodology of Faccio and Masulis (2005) where the dependent variable assumes the following values at the extreme where the method of payment for the percentage of cash is at one extreme of the boundary and the stock payment or all non-cash payment is zero. The coefficients of the Tobit model are estimated using the maximum likelihood estimator.

Table 7 shows the results of the Tobit model. All the independent variables are the same as in Table 6 and/ or Table 5. Consistent with Table 5 and Table 6, we find that the DB scheme has a significantly negative impact on the choice of cash as payment currency. The control variables in the analysis display the same pattern of impact on payment currency choice as in Tables 5 and 6.

Insert Table 7 here

6.3 Ordered Probit Regression.

In both the Logit and the Tobit regression in Table 6 and Table 7, the focus was mainly on the decision to finance a deal by cash payment or stock payment and we did not consider the mixed method of payment which is used in some of our sample takeover bids. Thus, it is important to model the bidder's decision to choose the mixed method of payment. From this perspective, an ordered probit model is attractive as it allows the qualitative decision to finance with cash or stock or both cash and stock.

Table 8 report the ordered probit regression when the dependent variable is denoted as 0 for pure stock deals, 1 for mixed deals and 2 for all cash deals. The results hold for the sample as compared to Table 7 where all sign and significance of the estimates are similar. More importantly, we observe that the DB scheme coefficient is negative and statistically significant at 1% in the regression. Among the control variables, Revenue proxying for bidder firm size and profitability are positive and statistically significant at 1% while the industry-relatedness of the target and the acquirer is positive and statistically significant at 5%.

Insert Table 8 here

To summarise the results so far, our results based on the OLS, logit, Tobit and ordered probit models are all strongly consistent as regards the impact of the target pension scheme on the bidder's choice of payment currency in UK takeovers. Where the target operates a high risk DB scheme, bidders play safe and avoid paying with cash and prefer paying with stock or mixed currencies to minimise the pension scheme related risk arising from the acquisition. Such risk avoidance behaviour is also borne out by the other significant variables in all these models. Larger and more profitable bidders are more likely to offer cash whereas in larger deals they are more likely to offer stock or more non-cash currencies. Bidders are also more inclined to offer cash for diversifying acquisitions pointing to a risk avoidance behaviour.

6.4 Sample selection bias issues

The sample used to estimate these models is observational i.e. a sample of takeovers that have already happened and is not experimental. This creates the problem of self-selection (or endogeneity) bias. We thus need to control for the selection bias in order to draw reliable conclusions in this paper. As noted in Section 5.2 above, Faccio and Masulis (2005) address the self-selection bias using the Heckman two–step procedure. We follow the same methodology as Faccio and Masulis (2005) and report the results in Table 9. We find, however, that the inverse Mill's ratio included in the regression is not significant and conclude that Tobit model (in Table 8) does not suffer from self-selection bias.

Insert Table 9 here

6.5 Impact of pension scheme on shareholder value gains

Table 10 presents the regression of 5 day CARs to bidder shareholders as a function of the target pension scheme. Consistent with our hypothesis H3, we find that the riskier the target pension scheme the smaller are the shareholder wealth gains to bidder shareholders around bid announcement. Thus acquisition of targets that operate the more risky DB schemes results in loss of value to bidder shareholders.

Among the control variables in the model, larger targets result in smaller value gains but financially stronger acquirers i.e. the more profitable firms with stronger short term liquidity add value through their acquisitions.

Insert Table 10 here

7 Summary and conclusions

The importance of employee pension schemes sponsored by companies has been on the rise in recent years. Thus the financing and investment policies of firms are affected by the surplus or deficit of their pension schemes. To this end, this paper investigates three key hypotheses when a firm is taking over a target taking into consideration the pension schemes.

H1 A high risk target pension scheme i.e. a DB scheme will lower the takeover premium paid by the bidder to target shareholders relative to a less risky scheme like DC;

H2: The target pension scheme's riskiness is negatively related to the bidder's willingness to pay with 100% cash or with a high proportion of cash in its payment currency mix and positively related to 100% stock exchange or with a high proportion of bidder's stock in its payment currency mix;

H3: Bidder's shareholders will experience more positive announcement period returns when the payment currency is appropriate for the target pension scheme risk than otherwise.

Using a sample of 138 M&A transactions involving both bidder and target listed on the UK stock exchange we investigate the three hypotheses. Consistent with the hypothesis we find that in the first instance that a riskier pension scheme will lower the premium paid by acquirers although it is not significant. Interestingly in this sample, we find that firms with high level of leverage are less likely to have a have a high risk premium in all three instances (1 day, 1 week and 4 weeks prior to the announcement date) while firm size is a significant factor for high risk premium. Second to analyse the second hypothesis relating to the methods of payment, this study use various alternative methodologies. The results presented in this paper is consistent throughout all the models. Bidders avoid paying by cash when targets operates a high risk DB scheme, thus prefer paying with stock or mixed currencies to minimise the pension scheme related risk arising from the acquisition. This risk averse activities is also undergone out by the other significant variables in all these models in the paper. We find that while larger deals they are more likely to offer stock or more non-cash currencies, larger and more profitable acquirers are more likely to offer cash. Bidders are also more inclined to offer cash for diversifying acquisitions pointing to a risk avoidance behaviour. When modelling the final hypothesis, the result shows that the riskier the target pension scheme the smaller are the shareholder wealth gains to bidder shareholders around bid announcement. This is consistent with the hypothesis that there is loss to the value of shareholders when they operates in risky pension schemes.

Appendix A: Variable Definitions

Ratio	Description
Debt to Capital	(Long Term Debt + Short Term Debt & Current Portion of Long Term Debt) / (Total Capital + Short Term Debt & Current Portion of Long Term Debt) * 100
Debt to Equity	(Long Term Debt + Short Term Debt & Current Portion of Long Term Debt) / Common Equity * 100
Discount rate	PENSION DATA - PENSION DISCOUNT RATE represents the annual rate at which the projected future liabilities are discounted back to the present date.
Operating expenses	OPERATING EXPENSES - TOTAL represents the sum of all expenses related to operations.
Cash	CASH represents money available for use in the normal operations of the company. It is the most liquid of all of the company's assets.
Depreciation	DEPRECIATION represents the process of allocating the cost of a depreciable asset to the accounting periods covered during its expected useful life to a business. It is a non-cash charge for use and obsolescence of an asset.
Net Income	Net Income – bottom line represents income after all operating and non-operating income and expense, reserves, income taxes, minority interest and extraordinary items.
EBITDA	EARNINGS BEFORE INTEREST, TAXES AND DEPRECIATION (EBITDA) represent the earnings of a company before interest expense, income taxes and depreciation. It is calculated by taking the pretax income and adding back interest expense on debt and depreciation, depletion and amortization and subtracting interest capitalized.
EBITDA	EARNINGS BEFORE INTEREST AND TAXES (EBIT) represent the earnings of a company before interest expense and income taxes. It is calculated by taking the pretax income and adding back interest expense on debt and subtracting interest capitalized.
REVENUE	NET SALES OR REVENUES represent gross sales and other operating revenue less discounts, returns and allowances.
Current Liabilities	CURRENT LIABILITIES - TOTAL represent debt or other obligations that the company expects to satisfy within one year.
Current Assets	CURRENT ASSETS - TOTAL represents cash and other assets that are reasonably expected to be realized in cash, sold or consumed within one year or one operating cycle.
Market Capitalisation	Market Price-Year End * Common Shares Outstanding
Market Value	Market value on DataStream is the share price multiplied by the number of ordinary shares in issue. The amount in issue is updated whenever new tranches of stock are issued or after a capital change.
Long term Debt	LONG TERM DEBT represents all interest bearing financial obligations, excluding amounts due within one year. It is shown net of premium or discount.
Total Assets	TOTAL ASSETS represent the sum of total current assets, long term receivables, investment in unconsolidated subsidiaries, other investments, net property plant and equipment and other assets.

Total Debt	TOTAL DEBT represents all interest bearing and capitalized lease obligations. It is the sum of long and short term debt.
Pension service costs	PENSION DATA - PENSION SERVICE COSTS represents the expense caused by the increase in pension benefits payable (the projected benefit obligation) to employees due to services rendered during the current year. (Present value of new benefits earned by employees during the year). For example, when an employee is covered by a defined-benefit pension plan the annual Service Cost is the increase in the present value of the future pension obligations due to an added year of service and salary
Pension Interest Costs	PENSION DATA - PENSION INTEREST COST represents annual interest costs which reflect the financing costs in a pension plan. Interest expense accrues each year on the projected benefit obligation based on a selected interest rate.
DC pension costs	The pension cost represents contributions payable by the Group to the insurance company
B/S DB (Assets) (£m)	Assets at the end of the period/Year
B/S DB Liabilities (£m)	Obligations at the end of the period/Year
B/S DB Deficit/(Surplus) (£m)	Asset minus liabilities
P&L DB Service costs (£m)	This is based on the discount rate at the beginning of the period and will therefore reflect current long-term market interest rates at that time
P&L DB Interest cost (£m)	The interest cost should be based on the discount rate and the present value of the scheme liabilities at the beginning of the period. The interest cost should in addition, reflect changes in the scheme liabilities during the period.
P&L DB (Expected return on Assets) (£m)	The expected return on assets is based on long term period and is expected to be reasonably stable
P&L Total DB cost (£m)	Sum of service, interest and expected return on assets
P&L Total DB cost (income)/Deficit	Total costs/deficit
ROA	Return on Asset
ROE	Return on Equity
Proforma ROA	Weighted average of acquirer's and target's ROA
Cash	CASH represents money available for use in the normal operations of the company. It is the most liquid of all of the company's assets.
MTBV	This is defined as the market value of the ordinary (common) equity divided by the balance sheet value of the ordinary (common) equity in the company.
Leverage	(Long Term Debt + Short Term Debt & Current Portion of Long Term Debt) / (Total Capital + Short Term Debt & Current Portion of Long Term Debt) * 100

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Table 1: Descriptive statistics of Number and Value of transactions per year

	ALL		DB		DC		NP	
Year	Number	Value ($m)	Number	Value ($m)	Number	Value ($m)	Number	Value ($m)
2002	8	2,271	4	1,606	2	343	2	321
2003	10	8,373	8	7,951	2	423	-	-
2004	12	10,937	9	10,807	2	130	1	-
2005	19	37,278	14	33,338	2	1,816	3	2,123
2006	22	106,539	19	104,051	3	2,487	-	-
2007	17	207,486	9	202,376	6	5,019	2	90
2008	15	45,024	8	41,978	5	3,003	2	43
2009	11	23,207	6	22,029	2	122	3	1,056
2010	14	28,965	4	7,841	9	21,124	1	-
2011	9	1,293	2	183	4	691	3	419
2012	1	20	1	20	-	-	-	-
Total	138	471,392	84	432,180	37	35,159	17	4,053

Table 2A: Descriptive statistics of Average and Median of premium 4 weeks prior to announcement per year (%)

	ALL		DB		DC		NP	
Year	Average (%)	Median (%)	Average (%)	Median (%)	Average (%)	Median (%)	Average (%)	Median (%)
2002	29	31	34	34	29	29	19	19
2003	37	34	33	27	53	53	-	-
2004	16	22	14	22	24	24	-	-
2005	22	19	26	25	6	6	11	11
2006	24	26	23	24	33	37	-	-
2007	41	39	43	37	16	2	99	99
2008	36	35	25	36	36	35	67	67
2009	27	25	36	39	20	20	20	20
2010	39	40	39	41	39	39	-	-
2011	51	50	53	53	67	71	26	26
2012	63	63	63	63	-	-	-	-

Table 2B: Descriptive statistics of Average and Median of premium 1 week prior to announcement per year (%)

Year	ALL		DB		DC		NP	
	Average (%)	Median (%)	Average (%)	Median	Average	Median	Average	Median
2002	39	33	54	36	27	27	21	21
2003	22	22	17	17	40	40	-	-
2004	28	29	26	28	35	35	-	-
2005	18	18	21	19	14	14	6	6
2006	21	21	18	17	37	36	-	-
2007	39	32	41	42	15	2	92	92
2008	37	32	29	31	31	28	73	73
2009	21	25	25	35	28	28	10	-1
2010	35	35	38	41	33	31	-	-
2011	58	54	56	56	76	73	33	33
2012	74	74	74	74	-	-	-	-

Table 2C:Descriptive statistics of Average and Median of premium 1 day prior to announcement per year

Year	ALL		DB		DC		NP	
	Average (%)	Median (%)	Average (%)	Median (%)	Average (%)	Median (%)	Average (%)	Median (%)
2002	37	31	51	36	27	27	16	16
2003	17	18	13	15	34	34	-	-
2004	27	24	26	23	30	30	-	-
2005	13	8	15	11	11	11	1	1
2006	17	13	15	12	27	13	-	-
2007	33	33	38	34	18	3	49	49
2008	39	34	32	33	33	36	71	71
2009	31	31	26	38	77	77	7	3
2010	31	28	36	39	29	25	-	-
2011	51	56	61	61	61	73	31	31
2012	74	74	74	74	-	-	-	-

Table 3 Panel A: financial characteristics

		Acquirer				Target			
		All	All cash	All stock	Mixed	All	All cash	All stock	Mixed
EBITDA (£m)	Average	179	183	155	190	73	50	78	116
	Median	224	224	224	224	34	16	34	69
	Obs	132	63	23	26	128	60	24	26
ROA %	Average	5	5.11	4	5	5	7.17	3	4
	Median	6	6	5	5	5	8	3	5
	Obs	135	63	25	26	126	59	24	25
ROE %	Average	13	12.60	11	15	11	12.00	9	8
	Median	14	14	14	15	11	11	11	10
	Obs	134	61	26	26	127	59	25	24
Revenue (£m)	Average	1,280	1,184	1,073	1,659	534	386	466	769
	Median	1,888	1,891	561	1,891	237	130	119	542
	Obs	136	63	26	26	137	64	26	27
Market Capitalisation	Average	1,804	1,952	1,719	1,463	484	363	577	604
	Median	926	853	876	574	311	145	271	322
	Obs	136	63	26	26	135	63	26	26
Total Assets (£m)	Average	1,192	1,368	1,021	1,134	962	677	773	1,219
	Median	609	630	609	609	313	127	313	824
	Obs	136	63	26	26	138	64	26	27
Cash (£m)	Average	77	80	62	80	44	28	35	66
	Median	88	89	63	89	24	13	12	36
	Obs	120	57	22	24	123	59	22	24
Cash/Total Assets (%)	Average	89	58	136	151	12	13	10	6
	Median	14	14	11	21	7	7	5	5
	Obs	120	57	22	24	123	59	22	24
MTBV	Average	2.18	2.31	2.08	2.20	2.21	2.06	2.02	2.47
	Median	1.78	1.78	1.71	2.00	1.81	1.81	1.66	2.08
	Obs	136	63	26	26	132	62	25	26
Total debt to total capital	Average	36.50	37.03	32.81	35.20	27.23	23.97	30.10	35.42
	Median	35.35	35.41	33.49	34.42	29.29	27.45	29.36	29.84
	Obs	138	64	26	27	128	59	25	25

Table 3 Panel B: Target financial characteristics

		Target			
		All	DB	DC	NP
EBITDA (£m)	Average	73	101	33	10
	Median	34	43	10	2
	Obs	128	79	35	14
ROA %	Average	5	5.72	5	4
	Median	5	5	8	4
	Obs	126	81	31	14
ROE %	Average	11	12.46	9	5
	Median	11	11	11	2
	Obs	127	78	35	14
Revenue (£m)	Average	534	753	254	30
	Median	237	334	87	19
	Obs	137	84	37	16
Market Capitalisation	Average	484	649	257	164
	Median	311	318	173	85
	Obs	135	82	37	16
Total Assets (£m)	Average	962	1,266	610	230
	Median	313	428	105	101
	Obs	138	84	37	17
Cash (£m)	Average	44	52	34	24
	Median	24	24	13	7
	Obs	123	77	33	13
Cash/Total Assets (%)	Average	12	12	18	21
	Median	7	7	16	7
	Obs	123	77	33	13
MTBV	Average	2.21	2.21	2.12	1.38
	Median	1.81	1.81	1.81	1.14
	Obs	132	81	37	14
Total debt to total capital	Average	27.23	33.56	15.34	17.49
	Median	29.29	31.01	9.53	6.77
	Obs	128	82	33	13

TABLE 4: OLS regression of premium

The table reports the results from an OLS regression for the premium. The dependent variable is the premium (offer price to target stock price premium (1 day, 1 week and 4 weeks) prior to announcement. The independent variables in this regression are the logarithm of revenue, logarithm of deal value return of total assets, proforma ROA measured as the weighted average of target and acquirer ROA financial leverage, the run up period of the bidders, MTBV, cross industry and the Define benefit variable (see Appendix for definitions). Z-statistics are reported in parentheses. *, ** and *** indicate significance at 10%, 5% and 1% respectively.

	Premium(1 day)	Premium(1 week)	Premium(4 weeks)
Revenue	0.0466** (2.30)	0.0555*** (2.81)	0.0555*** (2.86)
Deal Value	-0.0282 (-0.95)	-0.0227 (-0.79)	-0.0008 (-0.03)
Proforma ROA	0.0061 (1.15)	0.0057 (1.11)	0.0056 (1.11)
Leverage	-0.0020** (-2.14)	-0.0020** (-2.31)	-0.0023** (-2.55)
Run up	0.0081 (0.79)	0.0104 (1.05)	0.0081 (0.83)
MTBV	-0.0056 (-0.36)	-0.0033 (-0.22)	-0.0024 (-0.16)
Cross Industry	-0.1362* (-1.97)	-0.0891 (-1.32)	-0.0601 (-0.91)
DB scheme	-0.0416 (-0.84)	-0.0403 (-0.84)	-0.0564 (-1.19)
Intercept	-0.2553 (-0.69)	-0.3976 (-1.58)	-0.4122 (-1.66)
No. Observations	114	114	114
R Squared	0.11	0.12	0.13

TABLE 5: OLS regression of cash or stock as payment currency

The table reports the results from an OLS regression for the choice of payment currency. The dependent variable is the percentage of cash in the payment currency mix with all cash representing 100% and no cash 0%. The independent variables in this regression are the logarithm of revenue, logarithm of deal value return of total assets, financial leverage, the run up period of the bidders, MTBV, cross industry and the Define benefit variable (see Appendix for definitions). Z-statistics are reported in parentheses. *, ** and *** indicate significance at 10%, 5% and 1% respectively.

	All Cash	All Stock
Revenue	12.4261*** (3.72)	-10.3132*** (-3.38)
Deal Value	-14.5748*** (-3.06)	9.2237** (2.03)
Return on total assets	134.2966*** (3.63)	-122.6245*** (-3.47)
Leverage	0.0188 (0.10)	-0.0881 (-0.51)
Run up	-0.0832 (-0.05)	1.3635 (0.87)
MTBV	-1.2267 (-0.48)	1.3798 (0.56)
Cross Industry	11.8577 (1.07)	-15.8641 (-1.50)
DB scheme	-15.6617* (-1.91)	21.6502*** (2.77)
Intercept	-61.3353 (-1.44)	127.3968 (40.7507)
No. Observations	114	114
R Squared	0.30	0.29

TABLE 6: Logit regression of cash or stock as payment currency

The table reports the results from logit regressions of the choice of payment currency. The dependent variable assumes a value of 1 when the bidder offers 100% cash or 100% stock (All Cash or All Stock) and 0 otherwise. The independent variables for this regression are the logarithm of revenue, logarithm of deal value, return of total assets, proforma ROA measured as the weighted average of target and acquirer ROA, financial leverage, the run up period of the bidders, MTBV, cross industry and the Define Benefit scheme variable. See Appendix for definitions. Z-statistics are reported in parentheses. *, ** and *** indicate significance at 10%, 5% and 1% respectively.

	All Cash	All Cash
Revenue	0.5544** (2.37)	0.3842* (1.85)
Deal Value	-0.8034** (-2.51)	-0.7447** (-2.45)
Return on total assets	14.9213*** (3.20)	
Proforma ROA		0.1649*** (2.83)
Leverage	0.0057 (0.49)	-0.0006 (-0.06)
Run up	-0.0357 (-0.32)	0.0266 (0.26)
MTBV	-0.1452 (-0.82)	0.0325 (0.22)
Cross Industry	1.5471* (1.72)	1.5514* (1.76)
DB scheme	-1.7923*** (-3.08)	-1.1796** (-2.35)
Intercept	-4.6378 (-1.63)	-3.5844 (-1.36)
No. Observations	114	114
	0.25	0.19

TABLE 7: Tobit regression

The table reports the results from a togit regression for the choice of payment currency. The dependent variable is when the acquirer taking over the target in an all cash transaction and everything else is equal to zero. The independent variables for this regression are the logarithm of revenue, logarithm of deal value return of total assets, financial leverage, the run up period of the bidders, MTBV, cross industry and the Define benefit variable. Z-statistics are reported in parentheses. *, ** and *** indicate significance at 10%, 5% and 1% respectively.

	All Cash	All Stock
Revenue	22.6848*** (3.41)	-13.3037*** (-3.44)
Deal Value	-29.0408*** (-3.02)	11.9293** (2.23)
Return on total assets	224.6189*** (3.39)	-237.7024*** (-3.41)
Leverage	0.0526 (0.15)	-0.1356 (-0.68)
Run up	0.2754 (0.08)	2.3196 (1.26)
MTBV	-1.4723 (-0.28)	3.0919 (1.03)
Cross Industry	52.6757* (1.83)	-16.4907 (-1.36)
DB scheme	-47.7213*** (-2.71)	27.0613*** (2.95)
Intercept	-120.7632 (-1.51)	158.2629*** (3.19)
No. Observations	114	114
Pseudo Rsquared	0.06	0.04

TABLE 8: Ordered probit regression

The table reports the results from an ordered probit regression for the choice of payment currency. The dependent variable takes the value 0 when it is a pure stock transaction, number 2 for a mix transaction that is a mix of both cash and stock and 2 for a pure cash transaction. The independent variables for this regression are the logarithm of revenue, logarithm of deal value return of total assets, financial leverage, the run up period of the bidders, MTBV, cross industry and the Define benefit variable. Z-statistics are reported in parentheses. *, ** and *** indicate significance at 10%, 5% and 1% respectively.

	Model1
Revenue	0.4417*** (3.51)
Deal Value	-0.5010*** (-2.94)
Return on total assets	9.2102*** (3.97)
Leverage	0.0038 (0.60)
Run up	-0.0664 (-1.12)
MTBV	-0.1023 (-1.08)
Cross Industry	1.1118** (2.09)
DB scheme	-1.2046*** (-3.71)
No. Observations	114
Pseudo R Squared	0.24

TABLE 9: Tobit regression with Mill's inverse ratio

The table reports the results from a Tobit regression for the choice of payment currency. The dependent variable is when the acquirer taking over the target in an all cash transaction and everything else is equal to zero. The independent variables for this regression are the logarithm of revenue, logarithm of deal value return of total assets, financial leverage, the run up period of the bidders, MTBV, cross industry and the Define benefit variable. Z-statistics are reported in parentheses. *, ** and *** indicate significance at 10%, 5% and 1% respectively.

	All Cash	All Stock	All Cash	All Stock
Revenue	22.2869*** (3.34)	-13.2439*** (-3.41)	18.0811*** (2.70)	-11.8249*** (-2.74)
Deal Value	-29.2571*** (-3.04)	11.9459** (2.24)	-32.3732*** (-3.21)	12.4143** (2.06)
Return on total assets	224.9640*** (3.39)	-237.7008*** (-3.42)		
Proforma ROA			5.6158*** (3.13)	-2.2772** (-2.07)
Leverage	0.0698 (0.19)	-0.1377 (-0.68)	-0.0783 (-0.22)	-0.0389 (-0.18)
Run up	-0.0519 (-0.02)	2.3471 (1.27)	0.6997 (0.20)	1.2919 (0.63)
MTBV	-1.0749 (-0.20)	3.0489 (1.01)	1.6643 (0.31)	-0.9796 (-0.31)
Cross Industry	51.0559* (1.78)	-16.4909 (-1.36)	54.7636* (1.83)	-20.6716 (-1.49)
DB scheme	-47.9946*** (-2.72)	27.0994*** (2.95)	-33.7790** (-1.98)	17.8656* (1.78)
Mills inverse ratio	-85.8924 (-0.55)	11.6024 (0.15)	-191.3172 (-1.18)	63.7031 (0.71)
Intercept	-65.1605 (-0.50)	150.8447** (2.13)	25.1234 (0.19)	122.6287 (1.52)
No. Observations	114	114	114	114
Pseudo R Squared	0.06	0.06	0.05	0.04

TABLE 10: OLS regression of CAR (%)

The table reports the results of an OLS regression of CAR. The dependent variable is the CAR. The independent variables for this regression are the logarithm of revenue, logarithm of deal value return of total assets, financial leverage, the run up period of the bidders, MTBV, cross industry and the Define benefit variable. Z-statistics are reported in parentheses. *, ** and *** indicate significance at 10%, 5% and 1% respectively.

	CAR
Market Cap	0.0227 (0.79)
Deal Value	-0.0773* (-1.85)
Proforma ROA	0.0237*** (3.28)
Leverage	-0.3161 (-1.29)
Quick ratio	0.0847* (1.67)
DB scheme	-0.1249* (-1.73)
Intercept	0.1533 (0.38)
No. Observations	93
R Squared	0.22