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Public to Private Transactions, Private Equity and Financial Health in the UK: An Empirical Analysis of the Impact of Going Private

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Abstract

Using a hand collected data set of 138 buy-outs, this paper presents the first analysis of the impact effects of public to private transactions (PTPs) in the UK during a period (1998-2004) in which PTPs became a significant part of the market for corporate control. We find that for all PTPs there is a significant improvement in financial health in the post deal years relative to the year before going private. We also find that there is a significant improvement in the financial health of PTPs relative to firms remaining public. The analysis of the individual elements of the z-score shows that there are significant improvements in working capital and liquidity post deal. Profitability, however, shows significant declines in a number of the post deal years. We also find that both PE and non PE-backed deals produce improvements in financial health but that there is no difference between the two types of deal. These outcomes provide some support for the Jensen (1986; 1989) arguments that going private creates an organizational structure that reduces agency costs. However, they do suggest that the claims that the financial and governance mechanisms imposed by PE providers will produce better outcomes are strictly limited in the second wave of PTPs.

Public to private transactions, private equity and financial health in the UK: An empirical analysis of the impact of going private

1. Introduction

Public to private transactions are a distinct and increasingly important type of acquisition (Weir and Wright, 2006). A public to private (PTP) buyout involves buying the whole share capital of a publicly quoted company, usually by a newly incorporated unlisted company which has been set up specifically for the purposes of the deal (Jensen, 1993). The previously publicly quoted company is subsequently re-registered as a private company. These buy-outs are typically funded by substantial amounts of debt, and may or may not be backed by private equity (PE) firms. The shareholdings in the new entity are concentrated among executives with significant equity stakes and, where present, PE firms.

There have been three main waves of PTP activity. The first, took place in the US during the 1980s. The second occurred in the US and UK during the latter part of the 1990s and early 2000s. A third one also took place in the US during 2004-2007. Since the beginning of the 1990s, there has been a significant increase in the number and value of PTPs in the UK (Weir et al., 2005a). In the UK in 1991 there were 6 PTPs, each with an average value of £9.5 million. The highest number of deals was 46 in 1999 and the highest value per deal was £222.9 million in 2000. By 2003, the figure had fallen to 36 and the average value per deal to £106.6 million. In addition, the total value of deals increased from £57m in 1991 to £3,498m in 2004 (CMBOR, 2007). The increase in UK PTP activity in the late 1990s also occurred in the US, (Guo et al., 2009) and in Europe (Andres et al., 2007). Therefore, given the growth in the value of assets involved in

PTPs and the fact that they represent a distinct type of acquisition (Weir and Wright, 2006), it is important that the consequences of PTPs are understood.

This paper makes a number of contributions to the literature on PTPs. There is a significant literature on buy-outs in general (see Cumming, et al., 2007; Gilligan and Wright, 2010; Kaplan and Stromberg, 2008, for reviews) and the antecedents to PTPs specifically (see Renneboog et al., 2007 for a review). It has been shown that PTPs are a distinct subset of acquired publicly quoted companies (Weir and Wright, 2006), and Nikoskalainen and Wright (2007) reported differences in the characteristics of buyout types including PTPs.

Managers may be more likely to have private information in buyouts from other vendor sources, suggesting that they are more likely to generate greater operating performance improvements than whole firm PTPs (Muscarella and Vetsuypens, 1990; Singh, 1990; Meuleman, et al., 2009.) While there have been other recent studies of the performance of LBOs in the UK and Europe, it is only recently that there have been sufficient numbers of PTPs (CMBOR, 2007) to enable quantitative studies of this part of the market. This is in contrast to the US where much of the focus, particularly in the first wave of the 1980s, was on PTPs.

However, in spite of their increasing importance, there has been relatively little recent analysis of the consequences of PTPs for company operating performance. We are aware of only two studies that have dealt specifically with post PTP performance. A US study, Guo et al (2009), reports mixed evidence about the performance outcomes of PTPs. Using UK data, Weir et al (2008) find initial reductions in post-deal profitability of

PTPs which suggests poorer performance It is therefore of interest to evaluate the consequences of going private.

Given the above, the paper's first contribution is that it is the first to analyse the impact of UK PTPs on performance as measured by the financial health of the firms. We define financial health in terms of Taffler's z-score (Agrawal and Taffler, 2007). The z-score consists of four elements: profitability, working capital, financial risk and liquidity. Using the z score offers a number of advantages over single performance measures. First, not all PTPs have complex debt structures but in general, they do have high leverage compared to listed corporations. A key issue then is for them to be able to service this debt, which places emphasize on liquidity and financial risk issues. Given that we cannot pick up information on covenants and covenant breaches, focusing only on profitability may, therefore, not be particularly useful in these circumstances. Second, using an EBITDA ratio as a proxy for cash flow may also be limited because it does not adequately take into account the need for working capital nor does it allow for financial risk and liquidity needs. Although it is often assumed that PTPs have stable cash flow, this is a strong assumption and many PTPs are funded that do not have such stable cash flow. Third, improvements in liquidity, even without an increase in EBIT or EBITDA, can lead to an increase in exit value for the business**.** The z-score may thus be particularly useful in this context by offering a broader treatment of post-deal performance by analysing a wider range of indicators and going beyond the profitability consequences. The paper therefore adds to the emerging analysis of the impact of the second wave of buy-outs, the first having occurred during the 1980s.

The second contribution is that, most studies have used relatively small samples, for example, Opler (1992) had 42 firms, Cotter and Peck (2001) analysed 64 deals and

Kaplan (1989) used 76 transactions. Finally, Kosedag and Lane (2003) analysed a sample of 21 US re-LBOs – when firms go private and then return to the market and finally go private again. Our study uses a sample of 138 public-to-private transactions covering the period 1998-2004. We therefore believe that this adds to the significance of the findings.

The third contribution is that, as Kaplan and Stromberg (2008) note, performance data are not always available so that US studies have either analysed LBOs that use public debt and hence remain public or have analysed deals that go private but subsequently go public again. These studies may therefore be investigating performance outcomes that are not typical of the population of going private firms. In the UK, private firms are required to report financial results and so we are able to use the full population of PTPs where data are available. This avoids potential biases that may arise from relying on data relating to pre-reverse LBO performance for the subset of firms that return to market. However, it should be noted that the quality of the reported accounts may sometimes limit any expected advantage to be gained from their publication.

The fourth contribution relates to the fact that there has been a substantial increase in the activities of private equity (PE) providers since the early 1990s. Kaplan and Stromberg (2008) report that there has been a global increase in the number and value of leveraged buyouts backed by private equity funds from 1,123 and $148,614m respectively for 1990-1994 to 5,183 and $1,563,250m respectively for 2000-2004. They also show that in the US in 1990, private equity backed deals constituted less that 0.5% of the total stock market but by 2005 the figure had risen to just under 3%. Kaplan (1991), Wright et al (1995), Cotter and Peck (2001) and Wright (2007) argue that the presence of buy-out specialists, such as private equity providers, provide an additional

source of close monitoring because they usually have a relatively short exit strategy. Cressy et al (2007) show that UK buy-out PE backed deals improved performance in the first three years after the buy-out. In addition, there has been considerable controversy about the consequences of private equity involvement in going private deals (Financial Services Authority, 2006; Treasury Select Committee, 2007). The impact of their activities on performance is therefore of interest. This paper provides the first analysis of the impact of PE providers on the financial health of public to private transactions in the UK.

Our study covers PTPs completed in the period 1998-2004 to allow for up to five years post-deal performance. We find that for all PTPs there is a significant improvement in financial health in the post deal years relative to the year before going private. We also find that there is a significant improvement in the financial health of PTPs relative to firms remaining public. The analysis of the individual elements of the z-score shows that there are significant improvements in working capital and liquidity post-going private. Profitability, however, shows significant declines in a number of the post deal years. This is an important finding because it suggests that traditional accounting measures of performance may not identify performance indicators that are important in this type of transaction.

We also find that both PE and non PE-backed deals produce improvements in financial health but that there is no significant difference between the two types of deal. These outcomes provide some support for the Jensen (1986; 1989) arguments that going private creates an organizational structure that reduces agency costs. However they also suggest that the claims that the financial and governance mechanisms imposed by PE providers will produce better outcomes are strictly limited in the UK.

The paper is structured as follows. Section 2 discusses the relevant literature and sets out the hypotheses. Section 3 discusses the sample and presents the results of the analysis. Section 4 develops the analysis and Section 5 presents the conclusions.

2. Literature and hypotheses

2.1 Buy-outs in general

The agency model provides a context within which to evaluate the outcomes of PTPs. The diffuse ownership of a publicly quoted company means that monitoring and incentive mechanisms exert a weak influence on management. Jensen (1986, 1993) argues that a public to private buyout provides the means by which the agency costs incurred by the traditional model of public ownership will be reduced.

In general, PTPs are characterised by a change in the ownership and financing structure of the listed corporation. In this paper we distinguish between PE-backed buyouts and non-PE backed buyouts. PE-backed buyouts involve: (1) an increased concentration of firms' equity held by managers and private equity (PE) firms, (2) an increase in leverage with the firm taking on a large amount of debt secured against future cash flows and/or secured against firms' assets, and (3) active involvement in monitoring at board level by private equity funds when they finance an LBO. The largest example of a PE-backed PTP buyout in the UK is Alliance Boots which was delisted in 2007 in a deal led by the PE firm KKR. Non-PE backed buyouts are similar transactions, except that PE firms are not involved in the funding of the deal nor are they involved in monitoring, i.e. the deals are financed by debt and ownership is concentrated in the hands of management. An example of a UK non-PE backed PTP buyout is Bernard Matthews, where the firm was taken private in a deal led by the eponymous founder in 2000.

The high equity stake of management, fixed interest obligations of debt and monitoring by private equity funds create incentives and governance mechanisms that are expected to lead to improved performance (Jensen, 1986; Thompson and Wright, 1995). The high levels of debt mean that companies must generate sufficient cash to service the higher interest payments or risk the company failing. This leads to more effective monitoring and reduces the ability of management to expropriate any free cash flows because it has to be used to cover the increased interest payments (Nikoskelainen and Wright, 2007). In addition, lenders typically specify and closely monitor detailed loan covenants (Citron et al., 2003; 2008).

Much of the literature on post-LBO operating performance relates to PTPs in the first LBO boom which took place in the US during the 1980s. A number of US studies relating to this period have found improved operating performance post-buyout for PTPs including: Kaplan (1989), Smith (1990), Singh (1990) and Smart and Waldfogel (1994). Opler (1992) analyses going private LBO deals and finds that industry adjusted operating profits improve post-deal.

A number of other studies during this first wave find improvements in operating performance and efficiency by analysing buy-outs covering a range of vendor sources, including PTPs; buyouts of divisions; secondary buyouts; buyouts of family firms; buyouts of public sector firms; and buy-outs of firms in bankruptcy (for example, Lichtenberg and Siegel (1990), Wright et al (1992), Zahra (1995), Robbie et al (1993) and Amess (2002, 2003).

Further, a number of studies have looked at the performance of US reverse buy-outs, i.e. PTPs that come back to the stock market, and found improved performance in the years when the companies were privately owned (Muscarella and Vetsuypens, 1990; Singh, 1990; Holthausen and Larcker, 1996; Bruton et al., 2002; Cao and Lerner, 2009). The results therefore suggest that the benefits of going private persist. However, a small number of studies examined PTPs in the first wave that became distressed. Andrade and Kaplan (1998) examine a sample of 31 US PTPs that became distressed and show that the value of the firm did not decline, while Kaplan and Stein's (1993) study of larger US PTPs shows that higher leverage was associated with an increased probability of failure.

Studies of the effects of the second wave of buy-outs have assessed various aspects of performance and mainly focus on buyouts in general. For example, UK and US studies have found improvements in efficiency and productivity post-MBO (Harris et al., 2005; Davis et al., 2009). A number of studies have looked at employment effects where the evidence suggests that employment growth is higher post deal for MBOs but lower for MBIs (Amess and Wright, 2007). Meuleman et al. (2009) report that divisional buy-outs result in increased entrepreneurial activities compared to buyouts from other vendor sources. Acharya et al. (2009) find for a sample of larger exited UK buyouts funded by more experienced PE firms, that included a small number of whole company PTPs but mainly divisional and secondary buyouts, that their alpha out-performance is related to greater improvement in EBITDA to Sales ratio during the private phase, relative to that of their quoted peers. Ernst and Young (2008) find for a sample of larger exited buyouts that average annual enterprise value grew significantly more than in public company equivalents, but that PTPs performed less well than divisional, secondary or private buyouts, while Ernst and Young (2009) for the UK find evidence of organic growth.

There is limited evidence on the operating performance effects of PTPs in the second wave. Guo et al. (2009) also look at going private LBOs and find insignificant industry-adjusted changes in EBITDA/sales indicating no post-deal improvement in performance. Weir et al. (2008) report that after initial decreases, industry-adjusted profitability increases in years t+2 and again in t+4 across a range of profitability measures in the UK but the figure remains below that of the year before going private. It may be that the first wave provided easier opportunities for buyers in the US to gain significant profitability improvements because the initial buy-out innovation was able to identify firms that had high agency costs. By the time of the second wave, firms had improved their governance monitoring and incentive mechanisms, particularly in the UK in response to reports such as the Cadbury Report (1992), such that improvements in profitability were less likely to occur. In addition, Leslie and Oyer (2009) examine US PTPs and PTPs that experienced an IPO and find little evidence that PE-owned firms outperform public firms in profitability or operational efficiency.

Overall, the evidence suggests that for buy-outs in general, and PTPs in particular, their impact on a range of post-going private measures is positive. This paper utilises an alternative performance indicator, namely firm financial health, as measured by the Taffler z-score. The z-score is calculated as follows, with the coefficients having been published in Agrawal and Taffler (2007):

$$z = 3.20 + 12.18PBTCL + 2.50CATL - 10.68CLTA + 0.029NCI$$

Where:

PBTCL = profit before tax/current liabilities (a measure of profitability)

CATL = current assets/total liabilities (a measure of working capital)

CLTA = current liabilities/total assets (a measure of financial risk)

NCI = no credit interval defined as (current assets-current liabilities)/daily operating expenses. The no credit interval measures the number of days a company can finance its operations even if it is not generating revenue (a measure of liquidity).

The z-score is often used as a proxy for bankruptcy risk, for example, Taffler (1982 and 1983), Sudarsanam and Lai (2001), Dichev (1998), Lasfer et al (1996), Molina (2005) and Agrawal and Taffler (2007).

However, although associated with bankruptcy risk, the z-score has also been used in the analysis of firms that are going concerns [see for example, Citron and Taffler (1992 and 2004), Mulcher et al (1997) and Taffler et al (2004)]. As Agrawal and Taffler (2007) note, the z-score 'is a well-accepted tool for practical financial analysis.' We therefore use the z-score as a measure of financial health and a proxy for performance. The basic premises are that the higher the z-score, the better a firm's financial health and that increases in the score represent an improvement in financial health.

Therefore, based on the agency model, which argues that buy-outs will produce governance monitoring and incentive mechanisms that will reduce the scope for managerial discretion, our general hypothesis is:

Hypothesis H1: PTPs will experience improved financial health, that is, a higher z-score, in the post-going private relative to the score in the year before the deal.

From the equation above, the following hypotheses relate to the component parts of the score:

Hypothesis H2: there will be an improvement in profitability post-transaction (PBTCL)

Hypothesis H3: there will be an improvement in working capital post-transaction (CATL)

Hypothesis H4: there will be a reduction in financial risk post-transaction (CLTA)

Hypothesis H5: there will be an improvement in liquidity post-transaction (NCI).

2.2 The role of private equity

In this section we consider expected differences between PE-backed and non-PE backed buyouts. Buy-outs are the principal focus of private equity investments in which investors, and often a management team, pool their own money (together with debt finance) to buy-out the current owners and to create a new independent entity (Gilligan and Wright, 2010). Jensen (1989) argues that the growth of private equity investors has played an important part in the improvement in the performance of firms after they have gone private. Private equity represents effective active investors that create a superior organisational form based on financial, governance and operational innovations.

Cotter and Peck (2001) argue that the equity stake held by PE providers gives them a financial incentive to undertake active monitoring of the board. The greater the proportion of debt used in the financing of the PTP, the lower the proportion of equity. This allows PE providers, and management, to increase their equity stake which provides PE providers with the incentive to monitor the board.

PE firms' specialist expertise in monitoring may enable timely actions to be undertaken to improve performance and reduce the likelihood of firm failure. PE firms will typically require access to comprehensive and timely information. In contrast to investors in public companies, they take board seats and specify detailed contractual restrictions on the behavior of management (Thompson et al 1992). They also benefit from both pre-

purchase due diligence and full information on the current trading of the businesses in which they invest. As Wright et al (1995), Cotter and Peck (2001) and Cressy et al. (2007) argue, the presence of private equity firms, provides an additional source of close monitoring given that their strategy is to exit within the short to medium term (Wright et al., 1995).

The fund will have an exit strategy with the aim of maximizing returns in terms of fees and dividends received but the main source of return will be the exit value generated. This places further emphasis on the governance role of PE firms. Cornelli and Karakas (2008) find that board representation by PE firms changes according to private equity firm style and anticipated challenges of the investment. Operational innovations involve the managers of private equity funds gaining industry specific expertise, something which should be turned into improved performance. Therefore PE involvement should reduce potential agency costs relative to the original organizational structure.

In terms of company performance, Guo et al. (2009), on the basis of US evidence, report higher operating returns if more that one PE firm is involved in a deal. Cressy et al. (2007) find that the operating performance of UK PE-backed buy-outs is better than a matched sample of non-buy-outs. However, Jelic (2008) shows that, for a sample of UK buy-outs, PE involvement reduces profitability. Acharya et al.'s (2009) study of larger UK buyouts shows that out-performing deals are associated with mature private equity houses creating productive growth for portfolio companies through active and intense ownership and governance. Demiroglu and James (2009) find that PTP buyouts sponsored by high reputation PE firms are less likely to experience financial distress or bankruptcy ex-post.

Without the presence of a PE firm therefore, the post-PTP effects on performance may be reduced. Equity ownership by managers may provide an incentive to reduce agency costs and improve performance but managers with higher equity stakes may focus more on entrenching themselves in the business rather than improving performance (Short and Keasey, 1999). Higher managerial ownership is also associated with greater agency costs of debt (Jensen and Meckling, 1976), with higher debt as in buyouts potentially leading to greater agency costs. Management may, thus, engage in high risk activities in the absence of close monitoring by PE firms. Non PE backed buyouts may also experience less pressure to reduce agency costs if the objective of going private is to save listing costs, to reduce the tax liability or because the incumbent management believed the market undervalued the company (Weir et al., 2005b).

Thus:

Hypothesis H6: Deals involving PE providers will lead to a greater improvement in financial health than non PE backed deals.

In terms of the components of the z-score, we hypothesise that PE backed transactions, relative to non PE backed transactions will have:

Hypothesis H7: higher profitability post-transaction (PBTCL)

Hypothesis H8: higher working capital post-transaction (CATL)

Hypothesis H9: lower financial risk post-transaction (CLTA)

Hypothesis H10: higher liquidity post-transaction (NCI).

3. Data

The initial sample is drawn from data held by the Centre for Management Buyout Research (CMBOR) at Nottingham University and comprised 224 PTP deals that were undertaken between 1998 and 2004. The CMBOR database contains the population of

PTPs in the UK, both PE and non-PE backed. CMBOR tracks all PTP buyouts involving the creation of a new independent entity to effect the purchase of the whole share capital of a publicly quoted company which is then taken private. CMBOR details which of these deals are financed by private equity firms, based on equity providers' membership of the British Venture Capital and Private Equity Association and its European equivalents as well as US private equity firms and others from elsewhere, based on its experience from the early 1980s and in consultation with corporate finance advisors and other actors in the buyout market.

The availability of post-PTP financial data was then checked by means of the FAME database. At least four years data were required, from t-1, the year before the deal, to t+2, the year after the deal, up to five years post-deal. A minimum of two years post deal was chosen so that a reasonable degree of comparison was possible. 86 PTPs had to be excluded for a number of reasons. First, the quality of reported accounts is lower for private firms because they do not have to publish the same extensive information that a publicly quoted firm must, especially if they are small. This leaves gaps in the accounts and this makes the usefulness of many companies' data limited. Second, private firms may simply not lodge their accounts for a number of years. Third, name changes sometimes make it impossible to track a company and so financial information cannot be found. This resulted in a final sample of 138 companies, which covers 61% of UK PTPs during the period.

Data on exits were provided by CMBOR. It should be noted that many exited firms continued trading in one form or another and the post deal results take account of this by omitting any post exit accounting information presented in FAME.

4. Results

4.1 Whole sample results

Our key contention is that the higher the z-score, the stronger a firm's financial health. Further, a rising z-score will indicate an improvement in the firm's financial condition.

Insert Table 1

The results reported in Table 1 show the percentage of firms with higher z-scores in each of the years post-going private relative to the year prior to the change in status. For the whole sample, the average percentage of firms with higher z-scores is 60.8%, for PE backed deals, it is 62.7% and for non-PE backed transactions it is 58.6%. With the exception of t+2, the whole sample shows increases in each year rising to 64.6% in t+5. PE backed going private transactions rise each year with 66.7% having a stronger financial situation in t+5. Non-PE backed transactions fare slightly less well but by t+5, 62.1% have a higher z-score. These results therefore support hypothesis H1, that firms will experience an improvement in financial health after going private.

Table 2 shows that, relative to the year before going private, firms going private increase their median z-score from 3.72 in t-1 to 8.13 in year t+5. Except for t+3 and t+4, the z-score is higher in each of the post transaction years. We find that relative to t-1, the z-score is higher in each of the post-deal years with the differences being significant for the years t+2, t+3, t+4 and t+5.

The table also reports the financial health of firms going private relative to firms that remained public. The comparison used is the industry median z-score for firms remaining public that are in the same industry as the firm going private. The industry z-score was calculated using the Datastream industrial classifications. The industry median was calculated for each relevant sector for each year as required. A comparison

of the medians was carried out by means of the Wilcoxon Z test. Publicly quoted companies were used as the benchmark because we are interested in how PTPs perform relative to their original situation as publicly quoted companies. These were then matched to the various t-1 to t+5 years of the PTP sample. The final year, t+5, results should be treated with some caution because the industry figures only include data for the first nine months z-scores for 2008. However, they are consistent with the other results. Although not reported here, we also calculated the z-scores for the population of publicly quoted firms listed in the FAME database and compared them to the z-scores of the going private firms. The results were the same.

The results show that firms going private had lower z-scores than firms remaining public in the year prior to going private. However, the difference is not significant. In contrast in the post deal years, firms going private significantly improve their financial health relative to firms remaining public with the differences being statistically significant in years t+2 to t+5. The results in Table 1 are therefore consistent with the hypothesis H1 that financial health will improve after going private.

Insert table 3

Table 3 addresses hypotheses H2 to H5 and reports the results for the changes in the medians of the component parts of the z-scores relative to the t-1 figures. This enables us to ascertain which elements of the z-score appear to be driving the improvement in financial health. The results for profitability, PBTCL, do not support H2. We find that for each of the post deal years, PBTCL is lower than the year going private and that the declines are statistically significant in t+1 and t+3. The other post transaction years are not significantly different from t-1. The results indicate that profitability does not improve after the transaction but shows signs of either deteriorating or being no different from the year prior to going private. This result is consistent with Weir et al (2009).

We find evidence of improvements in working capital in the years after going private. The median CATL is significantly higher in each of the post going private years. Our results therefore support H3. We find that there is no evidence that financial risk is reduced after going private given that the differences in CLTA are not significant until t+5 when the figure becomes lower than that in t-1. Therefore, with the exception of t+5, we do not find support for H4 that short term financial risk will decrease in the short run after going private. Finally we find strong evidence for H5 that liquidity will improve in the post-deal years. The NCI figure goes from -11.50 in t-1 to 61.40 in t+5 with the improvement being statistically significant for each of the years t+2 to t+5.

The results therefore show that the improvement in financial health is being driven by improved levels of working capital and sharply increased liquidity. The expected improvement in the profitability measure does not happen which suggests that focussing on profitability may give an incomplete picture of the overall financial performance.

4.2 Private equity involvement

The analysis was extended to discuss the z-scores of deals that involved a PE firm and those deals that did not. As hypothesised earlier, hypothesis 6, we expect both types of deal to improve the z-score but for PE-backed deals to show a greater improvement. The results reported in Table 4 show that for PE backed PTPs, there is an increase in the z-score in every year post deal from 2.89 in t-1 to 9.76 in t+5. The increase is significant in t+3 to t+4. For non-PE PTPs, the figures are higher for each year, with the exception of t+2 where there is a significant reduction in the z score, but the none of the other differences are significant. The results are therefore similar to, but not as strong as, those for PE backed PTPs.

Insert table 4

The results in Table 4 therefore show that both PE and non-PE backed transactions will improve the financial health of the companies but the improvements are only significant for PE backed PTPs. However, the table also shows that there is no significant difference between the z-scores for the two types of deal for any of the years. This indicates that although PE involvement leads to improved financial health, it is not superior to that produced by non-PE backed deals. This does not support hypothesis H6 and suggests that, consistent with Jensen (1986 and 1989), the new post PTP organisational structure is generally effective regardless of the specific monitoring and governance mechanisms put in place after the deal.

Insert table 5

Table 5 offers additional insights into the above result. It consists of three parts, the first analyses how the medians of the component parts of the z-score changes for PE backed PTPs, the second deals with non PE PTPs and the third compares the two types of deal.

Profitability in the PE backed PTPs is below that in t-1 for all years but the difference is not significant in any of the years. Working capital was higher in each post deal year relative to the year before going private, with the difference being significant in all five years. We also report that there was no significant change in CLTA until t+4 and t+5 when it fell relative to the year before going private. We also find significant increases in the no credit interval in t+3 and t+4.

There is evidence that non PE backed PTPs result in lower profitability with the reduction being significant in t+1, however, the other years are not significantly different from t-1. Non-PE backed PTPs also produce significantly higher working capital relative to the

year before going private, in t+1 and t+3. However, financial risk does not change. Non PE backed deals also see a significant increase in the no credit interval for t+2.

If we compare the post PTP years for PE and non PE backed deals, we find no difference in profitability for any of the years and hence no support for hypothesis 7. Working capital is significantly lower for PE deals in t+1 but insignificantly different in the others which means that there is no support for hypothesis 8. Financial risk is significantly higher for PE backed deals in t+2 but there is no difference in the other years which indicates no support for hypothesis 9. Finally, contrary to hypothesis 10, we find no difference in the medians of the no credit interval for any of the years.

Overall, the results suggest that profitability changes do not drive the improvement in financial health post-deal. Relative to the year before going private, both types of deal improve working capital and both achieve significantly higher no credit intervals. PE firms achieve a better reduction in financial risk. However, there is no systematic difference in the components of financial health when PE and non PE backed PTPs are compared post-deal.

5. Analysis development

This section develops the analysis by comparing PE backed and non-PE backed deals in a number of ways. First, it assesses whether there are size differences in the deals backed by PE firms relative to non PE backed deals. Second, we examine differences in leverage in terms of the debt to equity ratio. Third, we examine differences in alternative measures of profitability, specifically return on assets (ROA). Fourth, we analyse exit by time and finally, we investigate the financial health of firms by type of exit.

5.1 Deal size

As Gilligan and Wright (2010) argue, a PE firm's income consists of three elements: first, management fees which are related to the capital value of the fund and to the value of a project's realized value; second, it will receive a share of the fund's profits; third, it will earn fees for arranging the deal. This suggests that PE-backed deals will be larger than non PE-backed deals because they will generate a potentially larger income for the fund. We measure size in two ways: deal value (i.e. enterprise value) and total assets the year before going private. The median deal value for PE backed deals is £102.0 million and for deals without PE involvement it is £24.7 million, the difference being significant at 1%. The median value of assets for PE backed deals is £97.3m and £43.9m for non PE backed deals. The difference is significant at 1%. These findings are consistent with Jelic (2008). The results are also consistent with Nikoskelainen and Wright (2007) who report that PE is likely to be involved in larger buy-outs because they offer potentially higher returns to the funds. In addition, smaller deals may be more difficult to exit and may also have a higher probability of failure (Wright et al., 1995).

5.2 Leverage

The potential importance of leverage is shown by the fact that, in the sample, PE backed deals have a median average 3 year post deal debt to equity rate of 50.3% whereas deals without PE providers have a median average ratio of 32.8%. Therefore the disciplining nature of debt and the requirement to generate cash to service the higher debt are consistent with the relative importance of liquidity elements in the PE backed PTPs z-scores.

5.3 Profitability

Given the downward movement in PBTCL, we evaluate two alternative measures of profitability, return on assets (ROA) and earnings before interest taxes, depreciation and amortisation (EBITDA). We find that firms taken over in PE backed deals have a significantly higher ROA than non PE backed deals in the year before going private, 5.72% and 3.65% respectively. We also find that ROA is lower in each of the post deal years relative to the year prior to going private for both types of deal, however, the difference is only significant in t+3 for PE deals and t+5 for non PE backed deals. The results for EBITDATA (EBITDA deflated by total assets) also show a decline in performance for both types of deal relative to the year before going private. However, the declines are statistically significant for each post deal year for PE backed deals but not significant for non PE backed deals. The results for PBTCL, EBITDATA and ROA are all consistent and show no evidence of improved profitability for either type of deal in the years following going private. They do provide some evidence of poorer performance. It is therefore important to look at the wider issue of financial health, as in our analysis of z scores, to gain greater insights into the effects of public to private transactions.

5.4 Exit

Evidence has shown (Wright et al, 1995) that PE providers are more likely to have an exit strategy and therefore will have a set time horizon in which to maximise their returns. As most PE firms involve the raising of closed end funds with a limited life, usually around ten years, there is a need to realise investments within this period in order to provide returns to investors; ensuring this timely also places emphasis on the governance role of PE firms.

We find that PE backed deals are more likely to result in exit than non-PE backed deals. 53.2% of PE backed PTPs resulted in exit whereas 22.0% of non PE backed PTPs led to exit. Alternatively, 46.8% of PE backed deals did not result in exit and for non PE backed deals the figure is 78%. The difference in exit rates is significant at the 1% level.

In our sample, we find that 34 firms exited within five years and a further 21 firms between 61 and 103 months. The mean period before exit was 52 months. These results are slightly longer than in Wright et al. (1995) who report in relation to the first buy-out wave that exit, where it occurs, tends to take place between 3-5 years. The difference may be that this sample analyses PTPs and the other looked at buy-outs in general. PTPs also tend to be the largest buy-outs and so it may take longer to produce the required return. Kaplan and Stromberg (2008) find that, globally, the median exit for buy-outs involving PE firms is around 6 years.

Insert table 6

Table 6 shows the z-scores for the companies that exited by time. The figures show the final z-score before exit. It must be noted that the numbers exiting by years are small and so any conclusions should be treated with caution. However, there is evidence that firms that exit improve their financial health in the years before exit. Early exits, up to 24 months see an increase in the median z-score from 2.27 to 6.92. For firms that exited between 25 to 36 months the figures rose from 0.61 to 17.44 but for firms exiting between 37 and 48 months the score decreased from 2.19 to -4.02. A fall also occurred for firms exiting during 49-60 months, 3.19 to -0.36. In contrast, exits that occurred later than 60 months also produced higher median scores, up from 2.23 to 14.20.

In the years that experienced a reduction in the z scores, the two most common types of exit were trade sales and MBO/MBI deals so the figure cannot be explained by firms

entering into receivership. It may be that other management teams or the current management saw opportunities that could not be pursued under the existing financial set up. All of the exits had had PE involvement and, given that the mean exit for PE deals is 55 months, it may be that exit was regarded as the most appropriate action. It may also be that this was driven by the fund's life span which may have been coming to an end.

Insert table 7

The reasons for exit were further analysed by investigating the types of exit. Exit takes a number of forms for example, trade sales, flotation as an IPO (or reIPO), a secondary buy-out, or bankruptcy (receivership).The results for types of exit are given in Table 7. The most common type of exit is trade sale, 24 firms (43.6%), followed by MBO/MBI with 17 (30.9%) exits with the other exits made up of receivership, 7 firms, and IPOs, 7 firms (12.7%).

The most common form of exit was trade sale which involves selling shares to an industrial investor. With the exception of t+3, there is evidence that, on average, these firms' financial health improved. The financial health of firms undergoing a secondary buyout exit also improved apart from t+5, which may suggest that these involved portfolio companies where cost reduction benefits had been exhausted and growth opportunities had yet to materialise but there was a need for exit as PE funds were nearing the end of their lives (Wright et al., 2006)**.** Not surprisingly, the z-scores for the receivership exits were generally very low and declining. Surprisingly, ReIPOs tended to have lower z scores before returning to the stock market. Although the number of exits is very small, it does appear that the early exits had the best z-score performance and of all of the firms returning to the stock market, just over half experienced an improvement in financial health.

7. Conclusions

Using a hand collected data set this paper presents the first analysis of the impact effects of public to private transactions on the financial health on UK firms. It deals with a period in which PTPs became more important in terms of the value of assets acquired and of the numbers of deals undertaken.

The z-score results show a significant improvement in the financial health of PTPs post-going private. The improvements appear to be driven by an increase in the firms' liquidity and working capital. The increased liquidity is essential for repaying interest on the firms' higher debt. The analysis shows that it is this aspect of performance rather than traditional accounting profitability measures that provides insights into the post-PTP performance. There is also evidence that PE backed PTPs produce significant improvements in financial health but we do not find that they are superior to non-PE backed PTPs. The results offer support for the Jensen hypothesis that going private creates financial, governance and operational advantages relative to remaining public. However, the results do not support the argument that the specific advantages offered by PE involvement necessarily provide a superior operating performance outcome. Thus, the first wave of UK PTPs of the late 1990s and early 2000s does not appear to have had the same degree and type of performance impact as those that were completed during the first wave in the 1980s in the US.

The research raises a number of potential avenues for further research. First, given the improvement in financial health, it will be of interest to investigate the sources of the improvement. For example have changes been made to the cash cycle? Second, splitting the sample of going private transactions by MBO and MBI may offer some additional insights into the consequences of going private. Third, the relatively weak

performance effects in terms of accounting profitability and the stronger effects on liquidity raise an important question concerning the returns generated to investors when deals are eventually exited. Significant value may be created for investors from increased liquidity even with weak improvement in accounting profitability. Further research is needed to examine the internal rates of return generated on exited deals and the extent to which these are determined by performance improvements or arbitrage in the form higher exit multiples.

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Table 1 Change in the financial health of public to private transactions where financial health is defined by the z-score where t-1 represents the year before going private and t+n is the nth year after the transaction.

	t+1	t+2	t+3	t+4	t+5
$\%Z_{t+n}>Z_{t-1}$					
- whole sample	56.5	61.4	59.6	62.1	64.6
- PE	58.2	60.2	62.6	66.0	66.7
- Non PE	55.9	62.9	55.3	55.8	62.1

$$z = 3.20 + 12.18PBTCL + 2.50CATL - 10.68CLTA + 0.029NCI$$

PBTCL = profit before tax/current liabilities. CATL= current assets/total liabilities CLTA = current liabilities/total assets NCI = no credit interval defined as (current assets-current liabilities)/daily operating expenses. The no credit interval measures the number of days a company can finance its operations even if it is not generating revenue.

** - significant at 5%; *** - significant at 1%

Table 2
z score analysis of PTP transactions.
Wilcoxon signed rank test for t-1 versus t+n tests where t-1 represents the year before going private and t+n is the nth year after the transaction.

	t-1	t0	t+1	t+2	t+3	t+4	t+5
PTP z-score median	3.72	3.01	4.31	12.23	6.66	5.94	8.13
n	138	138	138	127	114	96	65
Z test t+n versus t-1		0.04	1.17	2.97***	1.97**	2.60***	1.93*
Industry median z-score	3.88	3.56	3.48	3.38	3.71	3.69	3.76
Z test PTP versus industry median	0.69	0.20	1.10	3.34***	1.77*	2.29**	1.72*

$$z = 3.20 + 12.18PBTCL + 2.50CATL - 10.68CLTA + 0.029NCI$$

PBTCL = profit before tax/current liabilities. CATL= current assets/total liabilities CLTA = current liabilities/total assets NCI = no credit interval defined as (current assets-current liabilities)/daily operating expenses. The no credit interval measures the number of days a company can finance its operations even if it is not generating revenue.

** - significant at 5%; *** - significant at 1%

Table 3
Medians of the component elements of the z scores of PTPs.
Wilcoxon signed rank test for t-1 versus t+n tests where t-1 represents the year before going private and t+n is the nth year after the deal.

	t-1	t0	t+1	t+2	t+3	t+4	t+5
PBTCL median	0.23	0.15	.011	0.18	0.14	0.15	0.21
Z test t+n versus t-1		2.73***	2.04**	0.55	1.87*	0.51	1.49
CATL median	0.99	1.00	1.15	1.22	1.22	1.21	1.26
Z test t+n versus t-1		2.15**	3.34***	3.06***	3.37***	2.97***	1.90*
CLTA median	0.34	0.35	0.32	0.34	0.31	0.29	0.29
Z test t+n versus t-1		0.32	0.09	0.02	0.64	1.53	2.59***
NCI median	-11.50	-8.66	9.17	74.00	55.52	45.00	61.40
Z test t+n versus t-1		0.93	1.12	2.46**	2.54**	2.59**	1.65*

PBTCL = profit before tax/current liabilities. CATL= current assets/total liabilities CLTA = current liabilities/total assets NCI = no credit interval defined as (current assets-current liabilities)/daily operating expenses. The no credit interval measures the number of days a company can finance its operations even if it is not generating revenue.

* - significant at 10%; ** - significant at 5%; *** - significant at 1%

Table 4
Z scores Private Equity and non Private Equity transactions.
Wilcoxon signed rank test for t-1 versus t+n tests where t-1 represents the year before going private and t+n is the nth year after the deal. Mann Whitney used for comparing the z-scores for FE and non PE backed deals.

	t-1	t0	t+1	t+2	t+3	t+4	t+5
PE deals							
PE median	2.89	3.62	3.47	7.68	5.00	5.99	9.76
N	79	79	79	73	67	53	36
Z test t+n versus t-1		0.47	1.13	1.53	1.84*	2.01**	1.55
Non PE deals							
Non PE median	4.55	2.96	6.33	1.76	11.12	5.89	6.82
n	59	59	59	54	47	43	29
Z test t+n versus t-1		0.48	0.48	2.67***	0.77	1.55	1.00
Z test PE versus non PE	1.00	0.25	0.38	1.31	0.10	0.04	0.59

PE = private equity. Non PE = non private equity.

$$z = 3.20 + 12.18PBTCL + 2.50CATL - 10.68CLTA + 0.029NCI$$

* - significant at 10%; ** - significant at 5%;

Table 5
Medians of the component elements of the z scores of Private Equity and non Private Equity transactions
t-1 represents the year before going private and t+n is the nth year after the transaction. Wilcoxon signed rank test for t-1 versus t+n tests and Mann Whitney for PE v non PE tests.

	t-1	t0	t+1	t+2	t+3	t+4	t+5
(i) PE							
PBTCL	0.26	0.19	0.06	0.16	0.09	0.07	0.20
Z test t+n versus t-1		1.12	1.22	0.03	1.52	0.99	1.60
CATL	0.88	0.94	1.01	1.02	1.03	1.15	1.26
Z test t+n versus t-1		2.24**	2.91***	2.77***	2.60***	2.75***	1.84*
CLTA	0.38	0.39	0.37	0.39	0.35	0.30	0.31
Z test t+n versus t-1		1.45	0.43	0.06	0.67	1.72*	2.96***
NCI	-18.02	-15.23	10.61	54.85	107.74	113.00	125.20
Z test t+n versus t-1		1.10	0.85	1.07	2.51**	1.96**	0.67
	t-1	t0	t+1	t+2	t+3	t+4	t+5
(ii) non PE							
PBTCL	0.19	0.05	0.11	0.19	0.16	0.17	0.23
Z test t+n versus t-1		2.82***	1.67*	0.82	1.24	0.34	0.38
CATL	1.18	1.24	1.29	1.46	1.52	1.23	1.20
Z test t+n versus t-1		0.71	1.84*	1.55	2.16**	1.32	0.71
CLTA	0.31	0.32	0.28	0.27	0.26	0.23	0.27
Z test t+n versus t-1		1.04	0.02	0.21	0.21	.0.15	0.54
NCI	2.00	0.00	7.74	80.50	41.74	29.83	34.00
Z test t+n versus t-1		0.38	0.69	2.53**	0.81	1.24	1.49
	t-1	t0	t+1	t+2	t+3	t+4	t+5
(iii) PE v non PE							

PBTCL							
Z test PE versus non PE	0.83	2.20**	0.23	1.02	0.80	1.27	0.22
CATL							
Z test PE versus non PE	3.04***	1.66*	2.09**	1.46	1.46	0.53	0.03
CLTA							
Z test PE versus non PE	2.59***	1.58	1.63	2.15**	1.44	0.51	0.23
NCI							
Z test PE versus non PE	1.30	1.05	0.23	0.67	0.76	0.37	0.76

PE = private equity. Non PE = non private equity. PBTCL = profit before tax/current liabilities. CATL= current assets/total liabilities CLTA = current liabilities/total assets NCI = no credit interval defined as (current assets-current liabilities)/daily operating expenses. The no credit interval measures the number of days a company can finance its operations even if it is not generating revenue. .

* - significant at 10%; ** - significant at 5%; *** - significant at 1%

Table 6
Median exit z-scores for PTP transactions
t-1 to t+5 are the year prior to going private to five years after the transaction

	t-1	t0	t+1	t+2	t+3	t+4	t+5
Exit up to 24 months	2.27	2.82	6.92				
n=7							
Exit 25-36 months	0.61	1.49	-3.44	17.44			
n=12							
Exit 37-48	2.19	0.30	-0.92	12.31	-4.02		
n=8							
Exit 49-60 months	3.19	-3.70	0.43	-3.61	-8.33	-0.36	
n=7							
Exit over 60 months	2.23	4.08	3.09	2.80	3.68	3.56	14.20
n=21							

Table 7
Median z-scores by type of exit
t-1 to t+5 are the year prior to going private to five years after the transaction

	t-1	t0	t+1	t+2	t+3	t+4	t+5
Trade sale	2.24	0.51	-0.77	3.07	-4.75	5.99	39.27
n=24	24	24	24	21	18	13	10
MBO/MBI	3.01	5.23	9.04	11.58	11.12	8.55	-26.49
n=17	17	17	17	15	11	10	6
Receiver	3.37	1.92	4.51	0.93	3.87	0.18	0.42
n=7	7	7	7	5	4	2	2
Stock market	4.46	0.15	-1.80	2.80	4.16	1.14	5.48
n=7	7	7	7	7	6	5	4

n gives the number of exits by type. For example, there were 24 trade sale exits, 3 of which occurred during t+2 and 10 of which occurred after t+5.