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Public-to-private buy-outs, distress costs and private equity

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Abstract:
This paper extends previous work by testing the financial distress costs hypothesis in the context of the UK, a contract-based distress resolution system, and by considering the role of private equity firms. Using a hand-collected dataset covering 115 public-to-private buy-outs (PTPs) completed in the period 1998 to 2001 and 115 randomly selected firms that remained public, we find contrasting evidence to that for US PTPs. Consistent with the financial distress costs model, firms going private are more likely to have better asset collateralisation, have less debt and be more diversified. However, we also find that UK PTPs are more likely to be younger, experience poor stock market performance and be smaller than firms remaining public. In addition, PTPs did not have lower R&D, higher free cash flows. Our results therefore indicate that in the UK financial distress costs may not be central to the decision to go private.We also find that private equity providers are more likely to be involved in the process if the firm going private is more diversified, has a higher Q ratio and had been quoted for a shorter period of time and have lower board shareholdings. This suggests that private equity providers are more interested in growth prospects than potential financial distress costs.

Keywords Public-to-private activity; financial distress costs; private equity provision

JEL classification G32; G34

Public-to-private buy-outs, distress costs and private equity

1. Introduction

A public-to-private transaction occurs when a publicly listed company experiences a management buy-out, or a management buy-in, with the company's shares no longer being publicly traded. Going private removes a company from the monitoring mechanisms associated with public quotation. The traditional rationale for going private is the incentive realignment hypothesis associated with agency costs (Jensen, 1986a; 1989). The change of organizational form bonds management such that they become unable to pursue the consumption of perquisites and sub-optimal investment strategies. In contrast, Opler and Titman (1993) argue that it is important to identify factors that may deter rather than encourage the going private decision. Increased debt plays a central role in going private transactions with high leverage being found to be associated with financial distress (Andrade and Kaplan, 1998). Opler and Titman (1993) propose that potential financial distress costs may deter firms from going private and hence the expected benefits associated with this form of organizational structure may not be realized. Both approaches were tested in the context of the US environment of the 1980s and it is not clear whether the findings hold for other periods and other institutional contexts.

The US experienced an increase in going private deals in the early to mid 1980s, Lehn and Poulsen (1989) and Opler and Titman (1993). Opler and Titman (1993) report a substantial reduction in the number of going private transactions during the late 1980s but numbers increased sharply again from the late 1990s (Toms and Wright, 2005). The decision to go private has become more common in the UK since the late 1990s. Only 7 deals worth £390.2 million, accounting for 1% and 3.7% of deal numbers and

value respectively were completed in 1997 in the UK. By 1999, the annual number of PTPs had risen to 46, accounting for 7% of the market. In 2000, £9.3 billion worth of PTP transactions were completed, amounting to 39.2% of buy-out market value. The numbers had decreased to 33 by 2001, which accounted for 5.2% of UK buy-out deals but the funding involved, at £4.9 billion, still amounted to a quarter (25.1%) of market value**.** In addition, over the period, 1991-1997, 4.8% of total UK acquisitions involving publicly quoted companies were PTPs. During 1998-2000, the figure rose to 23.7% with the figure increasing in each of these years. PTPs have continued to be important, involving larger deals over time. Although the US and the UK are typically categorized as part of the same Anglo-American corporate governance system (La Porta et al., 1997; 1998), they display important differences in a number of respects (Toms and Wright, 2005) which emphasises the importance of examining the different contexts. Of particular relevance here are differences in the process relating to financial distress and in relation to the role of private equity (venture capital firms) in the funding of management buy-outs.

The bankruptcy process in the US, centred on Chapter 11 procedures, is court-based. Jensen (1989), writing in the US context, argues that the mechanisms put in place in leveraged buy-outs provide for the privatization of bankruptcy and the reduction of the financial distress costs associated with a court-based system. Andrade and Kaplan (1998) find little evidence in their study of highly leveraged transactions in the US that Chapter 11 is either inefficient or costly, while Ferris and Lawless (2000) find that the costs of Chapter 11 bankruptcy are lower in firms with higher amounts of secured debt. In contrast, the UK system is contract-based with debt contracts allocating rights across creditors, how rights are enforced and how the resulting

incentives affect the behaviour of the distressed company and its creditors (Franks and Sussman, 2003; Citron, Wright, Ball and Rippington, 2003). The UK's creditor-oriented insolvency system concentrates control rights in the hands of secured creditors, and provides an environment for these creditors to exercise their strict priority rights. This approach arguably helps overcome inefficiencies brought about by creditor co-ordination failures experienced in court-based debtor-oriented regimes such as in the US (Armour and Frisby, 2001). To date, however, there has been no examination of whether potential financial distress costs may deter firms from going private in this institutionally different context of the UK.

The involvement of private equity firms and their perspective on financial distress costs may have important implications for the characteristics of firms that go private. Private equity firms are typically interested in making investments where it will be feasible to exit within two to five years and achieve at least a minimum target rate of return and preferably more. This suggests that private equity firms' concerns about financial distress costs are likely to be reflected in them making investments where they have downside protection but with some growth prospects. In the US, leveraged buy-out associations play a role as active investors, but their contribution of equity financing is typically a small minority of total buy-out funding although this may be a significant part of their personal wealth (Cotter and Peck, 2001). Further, Kaplan and Stein (1993) report that the median percentage value of post-buyout debt to capital is 89.1%. While public-to-private transactions in the UK are also financed primarily by debt, equity constituted an average of 34.3% of the funding package of these transactions (CMBOR, 2003). The total value of public-to-private transactions over the period 1998-2001 was £21.4 billion. Given that some 70% of public-to-private

transactions in the UK were funded by private equity firms, these providers were supplying very large amounts of funding. The potential influence of this greater involvement of private equity firms in the UK in the consideration of distress costs in the going private decision has not previously been examined.

This paper extends previous work first by evaluating the financial distress costs theory in the context of the UK, a contract-based system, and second by considering the role of private equity firms. The paper makes a number of contributions to the going private literature. First, this is the first study to analyze the links between potential financial distress costs and the decision to go private using data from the period covering the late 1990s to early 2001. Second, it is the first study to investigate these issues using UK data. Third, the paper is the first to examine the role of private equity firms in the decision to go private in the UK.

We find that firms going private are more likely to be more diversified, to have poorer prior share price performance, to have been quoted for a shorter period, to be smaller and to have lower Q ratios than firms remaining public. Of the results, only those for the Q ratio and diversification are consistent with the financial distress costs model. However, the results for Q, diversification and prior stock performance are also consistent with the agency cost model. Our evidence relating to private equity firms shows that they are more likely to be involved in public-to-private transactions where the firm is more diversified, have a higher Q and have lower board shareholdings prior to going private. These results show that, while private equity providers invest in somewhat riskier firms, they cover themselves by not getting involved with public-to-private transactions that are likely to run the risk of potential financial distress costs.

The paper is structured as follows. The next section discusses the relevant literature and lays out the specific hypotheses to be tested. The third section explains the data and the models to be tested. Section four presents the results with section five reporting robustness checks. Section six develops the analysis by looking at the factors that influence the involvement of private equity providers in the funding of PTPs, section seven analyses the extent of actual financial distress and some conclusions are drawn in section eight.

2. Literature and hypotheses

Public-to-private transactions have generally been analysed from an agency perspective. The agency model argues that going private will be beneficial if the present organizational form enables management to consume excessive perquisites or undertake non-optimal investment in projects that produce negative net present values. To resolve agency issues, PTPs are usually funded largely by debt.[1] Management become committed to repay the increased coupon on the debt which means that future cash flows cannot be used sub-optimally and hence agency costs are reduced. Debt providers will monitor covenants on the debt (Citron, Robbie and Wright, 1997) and if the interest on the debt is not paid, the debt providers could put the company into liquidation, with shareholders having little chance of recovering the value of their shareholding (Citron, Wright, Ball and Rippington, 2003). This in turn will have potentially serious repercussions for the management because they usually increase the value of their equity holding post-PTP (Weir, Laing and Wright, (2004).

[1] For example, during the period under study, 1998-2001, senior secured and subordinated mezzanine debt provided an average of 65.7% of the funding for all public-to-private deals in the UK.

As a result, the increased monitoring by bond holders and the management's increased financial stake will militate against the consumption of perquisites and the policy of non-optimal investment in favour of the need to make profits.

While most attention has been devoted to the agency model outlined above, for example, Jensen (1986a), Lehn and Poulsen (1989), Kieschnick (1998) and Weir et al (2005a and 2005b), the possibility of financial distress has attracted limited interest. Financial distress costs can be either direct or indirect. Direct costs are those incurred by the legal and administrative process of liquidation or reorganization. Indirect costs refer to the costs associated with the difficulties of doing business. For example, Opler and Titman (1994) argue that customers, employees and suppliers all suffer if a firm experiences financial distress. A number of studies have attempted to quantify these costs. Weiss (1990) estimated direct financial distress costs to be around 3%-5% of the firm value at the time of distress. Altman (1984) estimated indirect costs to be around 25% of firm value and Andrade and Kaplan (1998) calculated them to be 10%-20% of firm value. These figures suggest that indirect financial distress costs are not trivial.

The essence of the financial distress costs model is that it is explicitly interested in explaining why firms may not go private rather than why they do go private (Opler and Titman, 1993). It argues that the decision to go private is affected by the potential costs of future financial distress. The model therefore discusses the characteristics that may militate against future success and concentrates on the sources of costs that will be incurred should the firm fail. The model is potentially important because it argues that the decision to go private represents a trade-off between the potential gains from,

for example, incentive realignment with the resultant reduction in agency costs, and the possible costs of financial distress. If financial distress costs are high, the potential gains from going private may not therefore occur.

In this paper, the financial distress costs hypothesis is tested in relation to the following variables: free cash flow (growth prospects), asset collateralization, firm diversification, product uniqueness, debt, company size, prior stock performance and firm age.

It is important to note that a number of the variables that explain potential financial distress costs are also common to the agency model and, even though the reasoning is different, they are predicted to have the same sign. We therefore refer to the agency arguments where relevant.

The explanatory variables are now discussed and the hypotheses explained.

(i) Free cash flows

The agency model argues that if a firm suffers from high free cash flows, it will benefit from going private (Jensen, 1986a). Free cash flows represent cash that could be distributed to shareholders rather than being retained by management. However, the financial distress costs model views free cash flow as a growth proxy if it is deflated by the market value of assets (Opler and Titman, 1993). This is because the market value of assets equals the risk-adjusted sum of discounted cash flows and high cash flows now will mean lower cash flow growth in the future. Myers (1977) develops a model showing that, if a firm experiences financial distress, its growth options lose value. Thus high growth options imply high distress costs. As Maupin et

al. (1984) report, going private transactions are most likely to occur in mature industries, which implies that future growth opportunities are limited. High present free cash flow therefore indicates lower future free cash flow growth as profitable investment opportunities become harder to identify.

The evidence relating to free cash flows is mixed. Maupin (1987) finds that firms going private had significantly higher cash flows than firms remaining public. She analysed a relatively long time span, 1972-1984, during which going private was relatively uncommon. Lehn and Poulsen (1989) also report a significant result for free cash flows but only for one of their four full sample equations. When they split their sample into two time periods, they find an insignificant result for the earlier period but significantly higher free cash flows in firms going private in the later period. This suggests that the relationship changes over time and that analysing long time series with cross-sectional methods of analysis does not identify the changing situation.

Kieschnick (1998), however, shows that the relationship may be sensitive to the method of analysis. Using a weighted maximum likelihood estimator, he finds no relationship between free cash flows and the decision to go private, a result supported by Halpern et al (1999). Opler and Titman (1993) support this when they reported that the free cash flows of firms going private were not statistically different from those of firms remaining public. In the UK, Weir, Laing and Wright (2005a, 2005b) also find no evidence that free cash flows affect the decision to go private. This result mirrors Powell (1997) who finds that free cash flows do not affect UK merger activity in general. However, in spite of the mixed results, we propose that:

H1: the financial distress costs model predicts that firms with higher free cash flows are more likely to go private because of lower financial distress costs

(ii) Asset Collateralization

In contrast to the agency model, where it is used as a proxy for growth prospects (Opler and Titman, 1993; Weir et al., 2005a), the financial distress costs model regards Tobin's Q as a measure of asset collateralization. This arises because, as Titman and Wessells (1988) argue, growth opportunities are intangible capital assets that cannot be collateralized. In addition, Myers and Majluf (1984) develop a model in which firms that have assets that are backed by tangible assets are more likely to take on extra debt. The extra debt helps to overcome the problem of information asymmetry, something which leads to investing in negative NPV projects as a result of managers having better information about the viability of projects than shareholders. Firms with significant intangible assets should therefore not take on extra debt because it cannot be covered by assets.

Given that going private is a largely debt-financed transaction, the financial distress costs model predicts that firms with low Q ratios are more likely to go private because more of their assets are collateralized. This reduces the potential costs of future financial distress. There is, however, limited evidence to support this argument. Titman and Wessells (1988) found no relationship between debt ratios and Q and Opler and Titman (1993) found that firms going private had lower Q ratios than those staying public in only one of the four equations they tested. They find no evidence that Q affects the probability of going private during the early 1980s but find that it is significantly lower for firms going private over the second half of the 1980s. Weir et

al (2005a) also find significantly lower Q ratios for firms going private in the UK. Thus, consistent with the financial distress hypothesis, we propose that high Q companies are less likely to go private because debt holders run a bigger risk if financial distress occurs:

H2: the financial distress cost model predicts that firms with greater asset collateralization, lower Q, are more likely to go private because of lower financial distress costs

(iii) Diversification

From an agency cost perspective, diversification is driven by managerial self-interest as it may be associated with entrenchment, cross-subsidisation or increased reputation associated with the signal that the person is able to manage large complex organisations (Jensen, 1986a; Montgomery, 1994; Shleifer and Vishny, 1990). From a financial distress costs perspective, more diversified companies are better able to spread risks and are less likely to experience financial distress costs (Titman and Wessels, 1988). This is supported by Morck et al (1990) who find that firms going private are more likely to be more diversified. In addition, Liebeskind et al (1992) report that firms sell off assets and become less diversified after going private. Therefore, we hypothesise:

H3: the financial distress costs model predicts that firms going private are more likely to be more diversified than firms remaining public because of lower financial distress costs.

(iv) Product Uniqueness

From an agency cost perspective, firms with high R&D expenditures are more likely to suffer high agency costs and are more likely to go private because it is more difficult to monitor whether spending is on negative net present value projects or on investments that will generate a positive return for shareholders (Opler and Titman, 1993).

From a financial distress costs perspective, if a firm is supplying a relatively unique, specialized good or service, going out of business will impose high costs on customers, suppliers and workers (Titman, 1984). Consequently, for example, other firms will be less willing to become creditors in the event that the firm shows signs of financial distress. Titman (1984) proposes that R&D intensity is a useful proxy for product uniqueness because firms that compete in markets where there are close substitutes are likely to undertake less R&D because the expected advantages are less likely to be long lasting. Thus, given the association with product uniqueness, high R&D spending will increase the probability of financial distress costs. Opler and Titman (1994) reported that, in adverse trading conditions, leveraged firms that supplied relatively unique products performed worse. We therefore expect firms with low R&D expenditure to be more likely to go private because of the lower associated financial distress costs. Support for this view was reported by Opler and Titman (1993) who found firms with high R&D spending were less likely to go private. In addition, Kaplan (1989) found that leveraged buyouts were more likely to occur in mature industries which are associated with less R&D. Therefore:

H4: the financial distress cost model predicts that firms with low R&D expenditures are more likely to go private because of lower financial distress costs

(v) Debt

The extent that a firm has underused its debt capacity will affect the probability of going private (Jensen, 1986b). From an agency perspective, low utilization of debt means that a firm does not have the bonding pressures associated with the close monitoring of bondholders. From a financial distress cost perspective, firms with low debt may have greater capacity to take on further debt to fund the transaction. Firms with high debt are more constrained in this respect and are likely to have higher future financial distress costs were they to take on further debt to go private. However, Halpern et al (1999) found an insignificant difference in the debt utilization of firms going private and firms remaining public. Consistent with financial distress costs argument, however, we hypothesise:

H5: the financial distress costs model predicts that firms going private are more likely to have lower debt utilization than firms remaining public because of lower financial distress costs.

(vi) Company size

From an agency perspective, if going private is being driven by the desire to realign interests, firms with the highest agency costs are most likely to go private. Agency problems are more likely to be most serious in large firms because of information asymmetries arising from the difficulties involved in monitoring management's actions and a lack of ownership control resulting from the more diffuse nature of

shareholdings in large firms (Nuttall, 1999). With respect to a distress costs perspective, Novaes and Zingales (1993) argue that large firms are likely to experience higher distress costs because of the importance of implicit contracts in large organisations. Such contracts may be hard to enforce if a firm is experiencing financial distress. However, Opler and Titman (1994) find that small firms are more likely to suffer financial distress because they are either more likely to go bankrupt or lack access to capital. They also find that small firms suffer a greater fall in sales during periods of financial distress. In addition, a number of studies, including Warner (1977) and Ang et al (1982), show that there is an inverse relationship between the costs of bankruptcy and firm size. However, Weiss (1990) in a study of publicly traded corporations found no evidence of a scale effect to bankruptcy costs and Opler and Titman (1993) found an insignificant relationship between size and the probability of going private. Although the evidence is mixed, consistent with the financial distress costs model, we hypothesise:

H6: the financial distress costs model predicts that larger firms are more likely to go private because of lower financial distress costs.

(vii) Prior stock performance

From an agency cost perspective, if firms going private have poorer stock market performance, this is evidence of higher agency costs and suggests that the firm is a candidate to be taken private (Halpern, et al., 1999). On the other hand, if it has better stock performance, this implies that there is a smaller chance of it incurring financial distress costs in the future. Therefore, the financial distress costs model predicts a different role for prior stock market performance. In terms of financial distress costs,

good performance prior to going private suggests that the firm is less likely to experience financial distress in the future. Hence:

H7: the financial distress costs model predicts that firms with good stock market performance are more likely to go private because of lower financial distress costs.

(viii) Firm age

In terms of firm age, it has been argued that younger firms are more likely to be acquired (Nuttall, 1999). Owners may seek to list corporations precisely to facilitate an acquisition in order to maximize their gains since the market for public corporations is more competitive than that for private firms (Zingales, 1995). Executives in newly listed firms may become disenchanted with the market for various reasons, including scrutiny by analysts, if they perceive that the market undervalues the firm and if they are unable to raise finance as expected.

In addition, younger firms may be more financially constrained and seek to be acquired in order to obtain financial synergies with established corporations. Younger quoted companies may be more at risk of financial distress or of going bankrupt as they face uncertainties about operating profitably in a market that can only be resolved after they have traded for a period of time (Jovanovic, 1982; Geroski, 1995). While these factors may encourage younger firms to seek to go private, the higher distress costs they imply are likely to make it more difficult for them to secure financial backing. Hence:

H8: the financial distress costs model predicts that older firms are more likely to go private because of lower financial distress costs.

(ix) Interactive terms

We also suggest that a number of interactions may influence expected relationships. Firms that have both a low Q and high free cash flows also have collateralisable assets and lower future growth prospects, both of which reduce the probability of financial distress costs. Opler and Titman (1993) find that the interactive term is significant and positive meaning that firms that combine low Q and high cash flows are more likely to go private. Hence, it is hypothesized from a financial distress perspective that the interaction of Q and free cash flows will be positively associated with the probability of going private. In addition, it is hypothesized that there is an interaction between Q and diversification. The financial distress costs model also predicts this outcome because it represents more collateralised assets and a greater spreading of risk. We also analysed the direction of asset collateralisation over time. This was done by looking at the relative performance of Tobin's Q over a period of two years. Consistent with the financial distress costs model, it is expected that firms going private will gave lower ratios, which indicates an increasing collateralization of assets.

We also control for a number of other variables that may affect the decision to go private. First, we control for possible tax benefits. In the US, Kaplan (1989) shows that there are tax benefits to be gained by going private. Lehn and Poulsen (1989) also found some evidence that firms going private paid more tax than firms remaining public. Kieschnick (1998) also finds that there are tax advantages to going private. However, the UK evidence shows no evidence of tax advantages, possibly because

the tax benefits of financing debt are greater in the US than in the UK, Renneboog et al (2005). Consistent with this, Weir et al (2002) found insignificant tax differences between firms going private and those remaining public and Renneboog et al (2005) report an insignificant link between tax liability and wealth effects of going private.

Second, we also control for board ownership. A number of studies including Maupin (1987), Halpern, Kieschnick and Rotenberg (1999) and Weir, Laing and Wright (2005b) found that internal ownership was higher in firms going private. This is consistent with higher agency costs arising from potential management entrenchment. Board ownership may cause agency problems at both high and low levels. Low board ownership raises agency costs because of the lack of financial incentive effects and high ownership may result in entrenched management. Firms with high board shareholdings may be in a stronger position to resist private equity firms' attempts to dilute their equity stake.

2.3 The Role of Private Equity

PTPS are financed by a combination of debt and equity. In relation to the equity element, PTPs may be financed with or without backing from private equity firms. According to the CMBOR database, those cases funded without private equity firms typically involve management (often founders) as the primary equity holders. Within the class of firms going private, we develop hypotheses to explain the extent to which private equity firms may seek to invest in PTPs that exhibit low potential financial distress costs. The null hypothesis is that there is no difference in the attitude towards financial distress costs between the two types of financier and that firms going private are therefore homogeneous in this respect.

If private equity providers are trying to reduce the chance of suffering financial distress costs, we expect that they will be more likely to be involved in PTPs that are more diversified. This reduces the chance of distress by spreading the firm's risk across a number of sectors. For private equity firms, the saleability of assets reduces the risk of not achieving minimum target rates of return on their investment. Where a sale can be achieved at above the purchase price, this facilitates the repayment of debt and generates some return for the private equity firm. Those firms without private equity firm investors are less likely to be diversified, perhaps because these firms are dominated by founders who are still in post:

H9: the financial distress costs model predicts that private equity providers are more likely to be involved in PTPs that are more diversified than are non-private equity providers because of lower financial distress costs.

If reducing the chances of financial distress is important, we expect that private equity providers are more likely to be involved in PTPs that have better stock market performance than other PTPs. This is because a better previous performance suggests less chance of future failure. In contrast, while non-private equity providers may be concerned to avoid failure, they may be more concerned about poor stock market performance reflecting the stock market's undervaluation of the firm (Weir, et al., 2005b). Thus:

H10: the financial distress costs model predicts that private equity providers are more likely to be involved in PTPs that have higher stock market performance than are non-private equity providers because of lower financial distress costs.

The financial distress costs model predicts that private equity firms should be attracted to going private transactions that suggest the lowest likelihood of financial distress. We therefore expect that private equity firms are more likely to become involved in low growth PTPs, as measured by free cash flows, as growth is expected to be riskier.

However, it may be argued that, of the firms going private, those with the highest growth prospects are more attractive to private equity providers than lower growth going private firms. Private equity providers seek to realise the gains on their investment with a relatively limited time period compared to non-private equity investors (Kaplan, 1991; Wright, Thompson, Robbie and Wong, 1995). Private equity providers will have contractual arrangements to exit the company within a few years and hence shorter-term growth prospects may be a more important consideration than the long-term viability of the business. In contrast, in the absence of a private equity investor, management as principal investors may have a longer time horizon and be under less pressure to achieve growth.

Peacock and Cooper (2000) state that private equity providers typically aim to sell their shareholding within two to five years. In addition, Wright et al (1996) find that those private equity backed buy-outs that fail, do so sooner than is the case for non-private equity backed cases but that the latter's failure rate overtakes that of the

former by year eight after buy-out. CMBOR (2003) data, which effectively covers the population of UK buy-outs finds that on a vintage year comparison, the failure rates of private equity backed buy-outs are generally higher than for non-private equity backed buy-outs. For example, by June 2003 24.5% of private equity backed buy-outs completed in 1990 had failed compared with 17.3% of non-venture backed buy-outs (CMBOR, 2003).

In order to be able to exit through an IPO, buy-outs need to have a 'growth story' to convince incoming investors to purchase the shares. Firms that have been constrained in realising their growth opportunities prior to buy-out may grow rapidly initially when such constraints are removed under the buy-out structure. The potential for expansion offered by the buy-out structure may require reversion to a listed corporation if the best use is to continue to be made of the assets (Wright, et al., 1994). Fast growing buy-outs may also be attractive to strategic buyers seeking to build-up their market presence in focused activities. Buy-outs that have the highest growth prospects thus become attractive with respect to the two main exit routes. By exiting in a relatively short period of time, private equity firms can achieve higher internal rates of return (IRRs) on their investment than if they are forced to wait longer for the same realization value; this is important given the focus on IRRs as the benchmark for private equity firm performance (Manigart, et al., 2002).

However, consistent with the financial distress costs hypothesis, we hypothesise that:

H11: The financial distress costs model predicts that private equity providers are more likely to be involved in PTPs that have lower growth prospects as measured by higher

free cash flow than are non-private equity providers because of lower financial distress costs.

In terms of the financial distress costs model, asset collateralization may be an important factor. Management and founders will be looking to protect their wealth and will therefore be keen to ensure that, in the event of financial problems, they will be able to generate as much excess from the assets as possible. Following the arguments outlined above, private equity firms may trade-off prospects for growth against collateralisable assets as they perceive that, should the firm fail, they are unlikely to receive repayment. Evidence from failed buy-outs suggests that even secured creditors on average receive little more than 60% of their lending (Citron, et al., 2003). However, consistent with the financial distress costs hypothesis, we expect that private equity providers are more likely than non-private equity providers to become involved in PTPs that have the greatest degree of asset collateralization, that is, a lower Q ratio. Therefore:

H12: the financial distress costs model predicts that private equity providers are more likely to be involved in PTPs that have a lower Q ratio than are non-private equity providers because of lower financial distress costs.

High R&D spending also increases the chances of financial distress because it is a proxy for product uniqueness, something which imposes high costs on customers and suppliers. We therefore expect private equity providers to be more likely than non-private equity investors to be involved in PTPs that have low R&D spending. In contrast, non-private equity investors may be more interested in cases with higher

R&D spending as this reflects their perception of growth opportunities that the market has failed to recognize. Hence:

H13: the financial distress costs model predicts that private equity providers are more likely to be involved in PTPs that have lower R&D spending than non-private equity providers because of lower financial distress costs.

Given that it was argued earlier that larger firms have lower financial distress costs, private equity firms may be more interested in investing in such firms. In contrast, non-private equity providers, typically dominated by founders and management, may be relatively more able to exert more control over smaller firms in order to avoid distress. In addition, non-private equity investors with fewer resources and less prominent reputations among the financial community may face greater difficulties than private equity firms in funding larger firms. Hence:

H14: the financial distress costs model predicts that private equity providers are more likely to be involved with PTPs of larger firms than are non-private equity providers.

It has also been argued that, given that firms are more likely to go bankrupt within the first three years of trading, potential financial distress costs become lower as firms get older. Hence, if the objective is to minimize financial distress costs, we expect private equity providers to be more likely to be involved in PTPs of older firms than are non-private equity investors. However, if disenchantment with the market is driving the management to take the firm private, we expect that non-private equity PTPs are more likely to become involved with younger firms. Thus:

H15: the financial distress costs model predicts that private equity providers are more likely to be involved with PTPs of older firms than are non-private equity providers.

Post-going private, firms will increase their debt. Firms with high current pre-going private debt levels will therefore increase this and be more susceptible to future financial distress costs given the commitment to service the higher debt. Firms with lower initial debt levels are less likely to experience this difficulty. Non-private equity investors may be associated with firms with lower levels of debt as they are likely to need to borrow more to fund the purchase as they are using very limited amounts of equity. Private equity firms may be able invest in relatively higher initial debt firms as they will be able to use more equity and quasi-equity funding to achieve their target rates of return. Hence:

H16: the financial distress costs model predicts that private equity providers are more likely to be involved with PTPs of higher debt firms than are non-private equity providers.

It is also proposed that the Q1Q2 and the interactive terms LQ*HFCF and LQ*HDIVERSIFIED will affect the probability of private equity firm involvement. The lower the Q1Q2 ratio, the more collateralized the assets will become and hence the greater the probability of private equity firm involvement. Financial distress costs will also be lower with the combination LQ*HFCF, that is low Q and high free cash flows, and so is more likely to attract a private equity provider. The combination of low Q and greater diversification, LQ*HDIVERSIFIED, will offer greater asset

collateralization and a wider spreading of risks, hence reducing financial distress costs.

As before, we also control for tax and ownership. Private equity providers are more likely to be involved in PTPs that offer greater potential for tax savings and hence potentially greater improvements in performance. Given that those cases funded without private equity firms typically involve management (often founders) as the primary equity holders, it may be argued that firms with high board shareholdings may be in a stronger position to resist private equity firms' attempts to dilute their equity stake. In addition, low management shareholding firms may require additional equity capital in the post-PTP stage. Financial constraints on the management may mean that they have to seek the equity from outside providers rather than take on additional extra debt. Additional equity may be preferred to additional debt because it is cheaper. Therefore, private equity firms may be more likely to be involved in PTP transactions in which the incumbent management has the lowest shareholdings.

3. Data and Model

The data cover the period 1998-2001. Data on the public-to-private transactions were obtained from the Centre for Management Buy-out Research (CMBOR) at the University of Nottingham. The sample consists of 115 PTPs for which data were available. We constructed a matched sample of 115 firms that remained public. There are two strands to the matching process, temporal and random. For each year of the sample, we have equal numbers of PTPs and randomly drawn firms remaining public. The matching was based on the methodology used by Ambrose and Megginson (1992) who argue that it allows comparisons without having to take account of trends

in ownership or financial structure and Halpern et al (1999) who maintain that it takes account of economy-wide factors. The methodology used, matching by sample size, is known as choice-based sampling and classifies the population into groups based on outcomes, Cosslet (1981). Choice-based sampling may be appropriate where random sampling would give a small number of cases falling into a particular category, Amemiya (1985). Relatively few firms, only around 2.05% of non-financial firms, changed their status from public-to-private so that, unless a randomly drawn sample was very large, random sampling would yield few companies making the change. This would create cost implications in relation to sample collection.

Data for Tobin's Q, free cash flow, size, debt, taxation and research and development were taken from Extel Primark Company Analysis. The diversification measure, entropy, was calculated from sales figures taken from Datastream. Board shareholdings data were obtained from the PriceWaterhouseCoopers Corporate Register. Data on firm age were taken from the Stock Exchange Year Book and Extel Primark Company Analysis. Prior stock performance was calculated using Datastream which provided details of firm share price performance and changes in the FTSE All Share Index. Stock performance was measured from one month prior to the date (t-1) of the announcement of the bid over the previous year (t-13). The time lag takes account of possible takeover rumours in the period before the bid was made public. Rumours of a bid are likely to increase the share price and so give a false impression of the stock's performance prior to acquisition. Information on the date of the announcement of the bid was provided by Acquisitions Monthly and the Financial Times Intelligence Service. The data for the PTPs are at the date of the last published accounts, that is, the year before the PTP took place. The non-PTP sample's data refer

to the same year. This ensures that the data for both groups are consistent in terms of time.

The binary nature of the relationship means that logistic regression is an appropriate technique. The dependent variable, Y_i, takes a value of one if the company goes private and zero if it remains public. Thus the initial model is:

$$Y_i = \beta_0 + \beta_1 Q_i + \beta_2 FCF_i + \beta_3 Diversified_i + \beta_4 R\&D_i + \beta_5 Debt_i + \beta_6 SharePerformance_i + \beta_7 Size_i + \beta_8 Age + \beta_9 Tax + \beta_{10} Boardshare \quad (1)$$

Consistent with the financial distress costs model, we hypothesise:

$\beta_1<0$, $\beta_2>0$, $\beta_3>0$, $\beta_4<0$, $\beta_5<0$, $\beta_6>0$, $\beta_7>0$, $\beta_8>0$.

β_9 and β_{10} are control variables and no sign is specified a priori.

We also run additional equations with β_{11}Q1Q2, β_{12}LQ*HFCF and β_{13}LQ*HDIVERSIFIED. We expect $\beta_{11}<0$, $\beta_{12}>0$, $\beta_{13}>0$.

The additional analysis investigates the likelihood of private equity providers being involved in a PTP compared to other financiers of PTPs. The new dependent variable, PEP, is defined as one if a private equity provider was involved and zero if not. The general model is:

$$PEP_i = \beta_0 + \beta_1 Q_i + \beta_2 FCF_i + \beta_3 Diversified_i + \beta_4 R\&D_i + \beta_5 Debt_i + \beta_6 SharePerformance_i + \beta_7 Size_i + \beta_8 Age + \beta_9 Tax + \beta_{10} Boardshare \quad (2)$$

Consistent with the financial distress costs model, we expect:

$\beta_1<0$, $\beta_2>0$, $\beta_3>0$, $\beta_4<0$, $\beta_5>0$, $\beta_6>0$, $\beta_7>0$, $\beta_8>0$.

β_9 and β_{10} are control variables and no sign is specified a priori.

We also run additional equations with β_{11}Q1Q2, β_{12}LQ*HFCF and β_{13}LQ*HDIVERSIFIED. We expect $\beta_{11}<0$, $\beta_{12}>0$, $\beta_{13}>0$.

The independent variables are defined as follows:

(i) Q is a proxy for Tobin's Q. Halpern et al (1999) define it as the ratio of the market value of common stock to its book value. However, their numerator does not take account of a company's debt and so does not represent a true measure of a firm's value. We follow the approach of, McConnell and Servaes (1990) and Opler and Titman (1993) and define Q as the ratio of a firm's market value of equity plus total debt minus cash in the balance sheet deflated by the book value of assets.

(ii) FCF is cash flow in excess of that required to fund projects that have a positive net present value deflated by an appropriate variable. Opler and Titman (1993) define the numerator as operating income before interest, taxes and depreciation. However, as Halpern et al (1999) point out, excluding dividends gives an inaccurate picture of the extent of free cash flow**.** We take account of this and define free cash flow as operating cash flow minus interest, tax and dividends as a percentage of the market value of assets. The numerator is similar to that of Lehn and Poulsen (1989) and the market value of assets is defined as the market value of equity plus the book value of debt, Opler and Titman (1993).

(iii) DIVERSIFIED is defined in terms of the entropy measure. $\sum s_i \ln\left(\frac{1}{s_i}\right)$ where s_i is the share of a firm's total sales of segment i and ln is the natural log.

(iv) R&D is research and development expenditure as a percentage of sales.

(v) DEBT is total debt as a percentage of total assets.

(vi) SHARE PERFORMANCE is the difference between the share's performance and the Index's performance over the year prior to the announcement of the bid. Share performance is the percentage change on the share price and the Index's performance is the percentage change in the FTSE All Share Index. Halpern et al (1999) use the ratio of the share performance to index performance. However, a negative relative performance can be generated either by a negative share movement and a positive index change or by a positive share change and a negative index change. The former shows poor firm performance and the latter good firm performance, however both will generate a negative ratio. By using the difference in the two measures, this ambiguity is overcome. For example, if the share price fell 5% and the index rose 5%, the difference would be minus 10; if the share price rose 5% and the index fell 5%, the difference would be plus 10. In both cases the ratio would be minus 1, which implies poor performance. In order to calculate the non-PTP share performance, each was randomly allocated the same date as the bid announcement of one of the PTPs for the relevant year.

(vii) SIZE is the natural log of total assets.

(viii) AGE is the number of years quoted on the London Stock Market.

(ix) TAX is the tax paid deflated by sales.

(x) BOARDSHARE is the equity ownership of the board of directors

We also test three other variables. First, Q1Q2, which provides a measure of the direction of asset collateralisation (financial distress costs) over time. It is defined as the Q ratio in the year before going private (at the last published accounts) divided by the Q ratio in the previous year. Second, LQ*HFCF is a dummy variable that takes a value of one if a firm had below median Q and above median free cash flow and zero

otherwise. Third, LQ*HDIVERSIFIED is a dummy variable that takes a value of one if a firm has below median Q and above median diversification and zero otherwise.

4. Results

Table 1 reports the descriptive statistics of the full sample of 115 PTPs and the 115 randomly selected, but matched by year, firms that remain listed. The mean Q ratio is 1.04**.** The mean Q_1Q_2 ratio shows that there was very little change in the Q ratios over the two years. There is evidence of a degree of diversification with the mean value being 0.29. Average free cash flow for the sample is 5.50% and the average debt is 21.00%. The average size of firms is £899.49 million. On average firms spend 1.76% of sales on research and development. The average number of years quoted is 17.8. Share performance averages -121.77% over the period and average board shareholdings are 19.29%. The average tax paid was 2.47% of sales. In terms of the interactive terms, 26% combined low Q and high free cash flows and 27% had a combination of low Q and high diversification.

Insert Table 1

Insert Table 2

Table 2 presents the univariate analysis of the characteristics affecting the decision to go private for the full sample. We find that firms going private had significantly lower Q ratios than firms remaining public. They also had lower Q1Q2 ratios Firms going private also experienced poorer stock market performance during the year prior to going private. We find no difference in the mean free cash flows or in the interactive Q-free cash flow variable. Board ownership is not significantly different. We also find that PTPs are more diversified but the difference is not significant. However, the Q-diversification interactive term is higher for firms going private. In contrast, research

and development spending is not significantly lower in firms going private**.** Firms going private were significantly smaller than firms remaining public. There is evidence that they had lower debt ratios but that they did not pay more tax. Finally, firms going private were significantly younger in terms of being publicly quoted.

Insert Table 3

The correlations reported in Table 3 show no signs of potential multicollinearity between the independent variables. In an additional test, we ran an OLS and found the range of Variance Inflation Factors to be 1.04 to 1.41, all well within the accepted limits. We therefore concluded that multicollinearity was not a problem. However, there were high correlations between Q and Q1Q2, 0.87; diversification and the diversification-Q interactive term, 0.49; and free cash flow and the free cash flow-Q interactive term, 0.44. These variables were therefore included in separate equations in the following tables.

Insert table 4

Four models are presented in Table 4. Model 1 is the basic model and models 2, 3 and 4 include additional terms. In terms of the financial distress costs model, we find that firms going private are more likely to have significantly lower Q ratios than firms remaining public. They also have significantly lower Q_1Q_2 ratios. This indicates that the Q ratio was falling relative to firms remaining public and hence that assets were becoming more collateralized in the period prior to going private. The results also show that firms going private are likely to be significantly more diversified than firms that remain public. As hypothesised, firms going private are more likely to experience a combination of a low Q and a greater degree of diversification than firms remaining public. These results are therefore consistent with the financial distress costs hypothesis because they indicate that firms going private have more collateralisable

assets. There is also evidence that firms going private are more likely to become involved in transactions with lower initial debt.

We also find no evidence that there are differences in the extent of free cash flows. Neither do we find that the interactive Q-free cash flow term is significantly different for the two groups of companies. Opler and Titman (1993) found a significant, negative relationship between the interactive term and the decision to go private. They included the interactive term in the same equation as their free cash flow variable. We ran a similar equation and also found a negative, and significant at the 10% level, relationship between the decision to go private and the Q-Free cash flow variable. However, as discussed above, the correlation between the interactive term and free cash flow was 0.44, which is high enough to suggest a multicollinearity issue so the Opler and Titman result should be treated with caution. Tax is also insignificant.

In addition, contrary to expectations, firms going private are smaller than firms remaining public. Opler and Titman (1993) find that firms involved in US LBOs were smaller but the result was not significant. This may be explained first by looking at the relative size of going private transaction in the UK and US. Opler and Titman's figures for 1985-1990 (excluding a very high figure for 1989) show that the average size of a going private transaction was $282 million whereas in the UK our sample of PTPs, covering a much later period, 1998-2001, averaged £131 million (around $210 million using £1-$1.60). Public-to-private transactions are therefore much smaller in the UK than in the US. Second, Opler and Titman only analyse the manufacturing sector whereas our non-PTP sample is randomly drawn from the whole economy. Third, it may also indicate that in the UK, firms going private tend to be younger and

hence smaller, which may suggest that management believes that the market does not accurately value the company.

5. Robustness checks

We undertook additional tests to investigate the role of a number of key variables. First, we looked at the measure of free cash flow. Halpern et al (1999) argue that deflating cash flow by sales is preferable to using the market value of equity because the latter's value takes account of factors such as capital structure. This criticism implies that regarding free cash flow as a growth proxy, as the financial distress costs model does, is incorrect. Nevertheless, we deflated free cash flow by sales and found that it remained insignificant in all equations. This result confirms the lack of importance that free cash flows play in UK going private transactions.

Second, we use an alternative measure of growth, the percentage change in total assets. The growth of assets was negative and significant at 1% suggesting lower growth prospects for firms going private. Third, to assess the effects of size, we replaced assets with market capitalization and sales. Both were also negative and significant. The initial results are therefore robust to variable definition.[2]

6. Role of Private Equity

As discussed earlier, we assess the extent to which the private equity providers become involved with PTPs that have potentially low financial distress costs. In this analysis, the dependent variable takes the value 1 if the going private transaction involved private equity funding and zero if it did not. The sample comprised 81 PTPs

that involved a private equity provider and 34 PTPs that did not. The results are reported in table 5.

INSERT TABLE 5

The results in Table 5 offer limited support for the financial distress costs explanation of private equity involvement. The positive diversification coefficient is consistent with the financial distress model and shows private equity providers being involved with PTPs in which risks are spread across a number of sectors. This provides private equity providers with opportunities to sell-off assets in order to refocus after going private.

However, contrary to the financial distress costs model, we also find that private equity providers are more likely to be involved with firms that have been quoted for a shorter period of time. This suggests that these firms have become disenchanted with the market and wish to return to being private. However, we find no evidence that private equity providers are more likely to become involved with higher growth PTPs with free cash flow being insignificant.

We find that private equity providers are more likely to be involved with higher Q PTPs. The mean Q ratio for private equity backed PTPs is less than one, 0.94, and for non-private equity backed PTPs it is 0.59. The means are significantly different at the 1% level. This suggests that, although they have lower Q ratios than firms remaining public (their mean is 1.49), private equity providers deal with PTPs that have the highest Q ratios, but still, on average, less than one. The fact that the average Q is less than one offers some support for the financial distress costs model because the private

[2] We also developed the analysis to differentiate between MBOs and non-MBOs. We find that MBOs are smaller, have better share performance, higher board ownership and higher debt. This provides

equity providers are involved in deals in which the assets are collateralized and could potentially provide a return in the event of financial distress. However, they are not involved with PTPs that have the lowest Q ratios and therefore the strongest asset collateralisation. This, as proposed, may reflect the willingness to trade-off some growth prospects for better asset collateralization.

Among the control variables, private equity firms are significantly more likely to be involved in firms with lower internal board ownership. This suggests private equity firms can address agency problems in this type of ownership structure whereas in cases with higher internal board ownership, dominant entrenched entrepreneurs take the firm private as they are dissatisfied with the market. The other variables are insignificant further suggesting that neither the agency nor the financial distress costs models provide a comprehensive rationale for the involvement of private equity providers in PTP transactions.

The overall results show that private equity providers are not likely to get involved with public-to-private transactions that are likely to run the risk of potential financial distress costs**.** Private equity providers appear to adopt a strategy of involvement in PTPs that offer the least degree of asset collateralization. They are involved with more diversified firms which offer greater opportunities for assets sales. This latter approach offers a means of generating returns when it may be difficult to refloat the company or find a trade buyer for the entire firm.

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limited evidence that MBOs are characterised by the desire to minimise financial distress costs.

As a robustness check we also carried out a multinomial logistic regression of private equity, non-private equity backed PTPs and matched firms remaining public. The results were similar. For space reasons, they are not reported here but are available from the authors.

7. Pre and Post PTP Financial Distress

In terms of the pre-PTP situation, we find that only three firms in the sample experienced financial distress. We find no evidence that private equity providers were interested in being involved with firms that were experiencing financial problems at the time of the decision to go private because they became involved in only one of the three transactions in which financial distress was present. Thus out of eighty one deals involving private equity providers, only one represented an additional risk at the time of the deal. The other two firms in financial distress at the time of the PTP were successfully turned around and were trading profitably after going private.

In terms of post-PTP financial distress, Cotter and Peck (2001) found that 21.88% of their sample experienced financial distress within four years of the LBO and 28.13% within six years. We find only six firms experienced financial distress in the five years post-PTP. This means that 5.2% of deals involving firms going private may be said to have failed within five years, a much lower figure than found by Cotter and Peck. This may reflect differences in attitudes towards risk in the UK. Of these six, five involved private equity providers one did not. Thus 6.1% of deals involving private equity providers failed. Alternatively, 93.9% of the PTPs they were involved in may be regarded as successes, which suggests that private equity providers become involved in deals that offer a significant chance of success. This indicates that the

involvement of private equity providers may reduce financial distress costs, hence increasing the probability of a successful PTP transaction.

We find that four of the PTPs that experienced financial distress involved MBOs, representing 4.3% of MBOs. Thus, again, there is evidence that where deals are completed, there is a high chance of success. These results offer support for the financial distress costs theory because we find that MBOs are likely to succeed. The other two cases were management buy-ins, representing 9.1% of MBIs. This difference between MBOs and MBIs is expected since the latter are riskier transactions. Greater information asymmetries at the time of the deal may make it difficult to judge future financial distress, yet evidence shows that generally MBIs have a higher failure rate than MBOs (Wright, et al., 1995).

8. Conclusions

This paper has extended previous research on public-to-private buy-outs in a number of ways. We have extended the Opler and Titman (1993) potential financial distress costs model as an explanation for firms going private using a sample of firms in the different distress resolution environment of UK and covering a later period than that considered in earlier work.

The analysis shows outcomes that are consistent with the financial distress costs model but there are also consistencies with the agency costs model, specifically in terms of the negative Q, the positive diversification variable and the positive interaction low Q and high diversification variables.

In terms of the variables that differentiate between the models, the results suggest that financial distress costs may not be central to the decision to go private. Contrary to expectations, firms going private experience poorer stock market performance in the year prior to going private. Firms going private are also more likely to be younger rather than older than firms that remain public. This is also contrary to the financial distress costs model and indicates a potential disenchantment with the market on the part of management.. In contrast to Opler and Titman, we find no evidence that firms going private spend less on R&D than firms remaining public. This may reflect the greater involvement of private equity firms in buy-outs in the UK than in the US and the relatively high level of innovative activity post buy-out (Wright, Thompson and Robbie, 1992).

We extended previous analysis to consider the role of private equity providers. We find that private equity providers are more likely than non-private equity backers to be involved in PTPs in which the firm going private is more diversified, has a higher Q ratio, are younger and had lower board shareholdings. This suggests private equity firms target corporations where there is the scope to unbundle assets to recoup outlay on the investment and reduce the risk of not achieving minimum target rates of return. There is some anecdotal evidence that this is the case (CMBOR, 1999). The finding of a higher Q ratio in this context may be consistent with anticipations of significant growth prospects. This raises additional questions about the financial distress costs model because our results suggest that private equity providers do not consider the longer term when backing a PTP. One reason may be that their involvement is likely to be short enough to make a profitable exit before financial distress becomes an issue (Wright, et al., 1995).

With respect to comparisons with the court-based US environment, in the contract-based resolution of distress context of the UK, we find that financial distress costs are potentially important and therefore may have a negative impact on the decision to go private. However, we do note some differences with US findings which may be attributable to the different bankruptcy regimes. In the UK contract-based system, knowing that any single creditor can exercise their rights may provide more effective monitoring than in the US where more creditor co-ordination is needed. It may be that the UK system is more effective at either preventing or avoiding financial distress because any individual creditor can set the distress resolution process in motion. In the context of pre-PTP characteristics, this may mean that the power of would-be creditors may be influential in determining which deals are financed. To be less likely of becoming financially distressed, PTPs should have high levels of collateral and be more diversified, which we find. This is consistent with these types of PTPs being attractive to future creditors because it puts them in a strong position should they need to exercise their rights. Although numbers are small, support for this argument is suggested by the lower financial distress proportion in our sample (six cases, 5%) than found by Cotter and Peck (14 cases, 21.88%).

It may be that in the UK the Q ratio is central to the decision to go private. Treating Q in terms of asset collateralisation may be more important from the perspective of the debt provider whereas the shareholder regards low Q as a sign of poor management and high agency costs. Further, Maupin et al (1984) suggested that managers involved in taking firms private interpreted Q as a measure of valuation rather than a measure of asset collateralization. The decision to go private may therefore be driven by the

perception that the market undervalues the company. There is also some anecdotal interview evidence from UK buy-out practitioners during this period that that they were targeting companies where this was the case (CMBOR, 1999). It would also be consistent with Zingales (1995) who argued that going public enabled the owner to retain an ownership stake that would maximize the value from its eventual sale. Clearly if the objective of going public was to increase personal wealth and the market was perceived as undervaluing a company, the owner would have an incentive to take it private again. This would also explain why firms going private had been quoted for a shorter time than firms remaining public. It would also explain why firms going private were smaller.

The results suggest a number of further areas for research. First, the debt side of the transaction is something that has not been addressed. For example, what proportion of going private funding is provided by debt and what factors determine that proportion? Hence the final structure of the transaction may offer additional insights into the going private process. Second, there is a need for research that examines the extent to which private equity firms unbundle public-to-private management buy-outs by selling off surplus assets and how this impacts both failure rates and survival.

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Table 1
Descriptive statistics for the sample

Variable	Minimum	Maximum	Mean
Diversified	0	1.64	0.29
FCF(%)	-81.76	54.12	5.50
Q	-0.25	13.73	1.04
Debt	0	111.36	21.00
Shareperformance	-121.77	386.37	-9.91
Tax	0	18.28	2.47
Q1Q2	-0.05	4.95	1.04
LQ*HFCF	0	1	0.26
LQ*HDIVERSIFIED	0	1	0.27
Size (£m)	5.83	2578.57	899.49
R&D (%)	0	23.71	1.76
Age (years)	2	81	117.8
BoardShare (%)	0.01	75.31	19.29

Q is the ratio of a firm's market value of equity plus total debt minus cash in the balance sheet to the book value of assets. FCF is operating cash flow minus interest, tax and dividends deflated by the market value of equity plus the book value of debt. Diversified is defined in terms of the entropy measure. Size is the book value of total assets R&D is research and development expenditure as a percentage of sales. BoardShare is the total equity holdings of the directors. Age is the number of years quoted on the London Stock Market. Q_1Q_2 is the Q ratio in the year before going private (at the last published accounts) divided by the Q ratio in the previous year. LQ*HFCF is a dummy variable that takes a value of one if a firm had below median Q and above median free cash flow and zero otherwise. LQ*HDIVERSIFIED is a dummy variable that takes a value of one if a firm has below median Q and above median diversification and zero otherwise. Debt is the percentage of total debt deflated by total assets. Share Performance is the change in the share price minus the change in the FTSE All Share Index over the period one month prior to the announcement of the bid to twelve months before that. Tax is the percentage of sales paid in tax.

Table 2
Univariate analysis comparing the characteristics of firms going private (n=115) with a random sample, matched by year, of those that remain public (n=115)

Variable	PTP	Remaining Public	t value	z statistic
Diversified	0.32	0.31	0.26	0.13
FCF (%)	6.43	5.11	0.68	0.49
Q	0.83	1.40	2.72***	2.48**
Q1Q2	0.90	1.14	2.86***	1.25
Debt (%)	18.87	22.46	1.67*	1.50
SharePerformance	-20.62	0.79	3.25***	3.13***
Tax (%)	2.44	2.51	0.20	0.01
Size (£m)	130.42	928.72	3.53***	2.92***
R&D (%)	0.67	1.04	1.03	1.24
LQ*HFCF	0.26	0.27	0.14	0.14
LQ*HDIVERSIFIED	0.33	0.22	1.77*	1.76*
Age (years)	13.51	19.93	4.09***	2.66***
BoardShare (%)	16.21	13.48	1.07	2.07**

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

Q is the ratio of a firm's market value of equity plus total debt minus cash in the balance sheet to the book value of assets. FCF is operating cash flow minus interest, tax and dividends deflated by the market value of equity plus the book value of debt. Diversified is defined in terms of the entropy measure. Size is the book value of total assets R&D is research and development expenditure as a percentage of sales. BoardShare is the total equity holdings of the directors. Age is the number of years quoted on the London Stock Market. Q_1Q_2 is the Q ratio in the year before going private (at the last published accounts) divided by the Q ratio in the previous year. LQ*HFCF is a dummy variable that takes a value of one if a firm had below median Q and above median free cash flow and zero otherwise. LQ*HDIVERSIFIED is a dummy variable that takes a value of one if a firm has below median Q and above median diversification and zero otherwise. Debt is the percentage of total debt deflated by total assets. Share Performance is the change in the share price minus the change in the FTSE All Share Index over the period one month prior to the announcement of the bid to twelve months before that. Tax is the percentage of sales paid in tax.

Table 3 Correlation matrix

	Diversified	FCF	R&D	Q	Size	Debt	Share performance	Tax	Q1Q2	LQHFCF	LQHDIVERS	Age
Diversified												
FCF	-0.15											
R&D	0.02	-0.05										
Q	-0.03	0.10	0.20									
Size	0.17	-0.04	0.01	0.01								
Debt	-0.03	-0.05	-0.02	0.12	0.15							
SharePerformance	-0.04	-0.02	-0.05	0.09	0.04	-0.01						
Tax	0.18	-0.09	0.02	0.12	0.02	-0.14	-0.01					
Q1Q2	-0.02	-0.05	0.20	0.87	0.01	0.09	-0.07	0.09				
Lqhfcf	-0.01	0.44	-0.07	-0.23	-0.02	-0.16	-0.04	-0.04	-0.15			
Lqhdivers	0.49	-0.12	-0.08	-0.23	0.01	-0.08	-0.01	-0.09	-0.14	0.28		
Age	0.38	-0.23	-0.06	-0.02	0.17	-0.11	0.01	-0.02	-0.02	0.05	0.25	
BoardShare	-0.24	0.17	-0.05	-0.06	-0.18	-0.09	0.03	-0.01	-0.07	0.03	-0.09	-0.22

Q is the ratio of a firm's market value of equity plus total debt minus cash in the balance sheet to the book value of assets. FCF is operating cash flow minus interest, tax and dividends deflated by the market value of equity plus the book value of debt. Diversified is defined in terms of the entropy measure. Size is the book value of total assets R&D is research and development expenditure as a percentage of sales. Board shareholdings is the total equity holdings of the directors. Age is the number of years quoted on the London Stock Market. Q_1Q_2 is the Q ratio in the year before going private (at the last published accounts) divided by the Q ratio in the previous year. LQ*HFCF is a dummy variable that takes a value of one if a firm had below median Q and above median free cash flow and zero otherwise. LQ*HDIVERSIFIED is a dummy variable that takes a value of one if a firm has below median Q and above median diversification and zero otherwise. Debt is the percentage of total debt deflated by total assets. Share Performance is the change in the share price minus the change in the FTSE All Share Index over the period one month prior to the announcement of the bid to twelve months before that. Tax is the percentage of sales paid in tax.

Table 4
Multivariate analysis of factors affecting the likelihood of firms going private (n=115) relative to a randomly drawn sample of firms that remained public (n=115).

Variable	Model 1	Model 2	Model 3	Model 4
Diversified	1.1876 (2.55)**	1.3150 (2.76)***	1.3002 (2.89)***	
FCF	-0.0100 (0.95)	-0.0098 (0.94)		-0.0061 (0.59)
R&D	-0.0162 (0.26)	-0.0585 (0.92)	-0.0538 (0.93)	-0.0322 (0.57)
Q	-0.8188 (3.09)***			
Size	-0.3571 (2.97)***	-0.3563 (2.95)***	-0.3439 (2.99)***	-0.2986 (2.70)***
Debt	-0.0133 (1.33)	-0.0168 (1.75)*	-0.0162 (1.69)*	-0.0145 (1.52)
SharePerformance	-0.0088 (2.37)**	-0.0111 (2.91)***	-0.0090 (2.57)**	-0.0101 (2.72)***
Tax	0.0024 (0.03)	-0.0117 90.18)	-0.0519 (0.81)	-0.0079 (0.12)
Q1Q2		-0.9647 (3.66)***		
LQ*HFCF			-0.2047 (0.63)	
LQ*HDIVERSIFIED				1.1150 (3.04)***
Age	-0.0749 (4.33)***	-0.0812 (4.59)***	-0.0634 (4.00)***	-0.0619 (3.90)***
BoardShare	-0.0057 (0.68)	-0.0058 (0.67)	-0.0051 (0.62)	-0.0058 (0.70)
Constant	3.5598 (4.83)***	3.9438 (5.08)***	2.7094 (4.14)***	2.8304 (3.74)***
Chi square	61.92***	65.92***	49.87***	51.08***

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

t values in brackets

Q is the ratio of a firm's market value of equity plus total debt minus cash in the balance sheet to the book value of assets. FCF is operating cash flow minus interest, tax and dividends deflated by the market value of equity plus the book value of debt. Diversified is defined in terms of the entropy measure. Size is the natural log of total assets R&D is research and development expenditure as a percentage of sales. Boardshare is the total equity holdings of the directors. Age is the number of years quoted on the London Stock Market. Q_1Q_2 is the Q ratio in the year before going private (at the last published accounts) divided by the Q ratio in the previous year. LQ*HFCF is a dummy variable that takes a value of one if a firm had below median Q and above median free cash flow and zero otherwise. LQ*HDIVERSIFIED is a dummy variable that takes a value of one if a firm has below median Q and above median diversification and zero otherwise. Debt is the percentage of total debt deflated by total assets. Share Performance is the change in the share price minus the change in the FTSE All Share Index over the period one month prior to the announcement of the bid to twelve months before that. Tax is the percentage of sales paid in tax.

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Table 5
Factors affecting the choice of venture equity providers and the decision to go private (n=115 public-to-private transactions, 81 involved a private equity provider and 34 did not).

Variable	Model 5	Model 6	Model 7	Model 8
Diversified	1.2850 (1.69)*	1.2157 (1.67)*	1.2808 (1.75)*	
FCF	0.0121 (0.52)	0.0093 (0.43)		0.0136 (0.67)
R&D	0.1226 (0.69)	0.1993 (0.92)	0.1968 (0.84)	0.2405 (0.93)
Q	1.6451 (2.65)***			
Size	0.2148 (0.86)	0.1161 (0.50)	0.0777 (0.33)	0.2374 (1.03)
Debt	0.0058 (0.30)	0.0156 (0.85)	0.1295 (0.69)	0.0134 (0.74)
SharePerformance	0.0034 (0.47)	0.0067 (0.98)	0.0066 (0.98)	0.0053 (0.76)
Tax	0.0752 (0.46)	0.1860 (1.22)	0.1998 (1.28)	0.1967 (1.38)
Q1Q2		0.1479 (0.27)		
LQ*HFCF			-0.5952 (1.12)	
LQ*HDIVERSIFIED				-0.4878 (0.96)
Age	-0.0582 (1.62)	-0.0702 (2.04)**	-0.0634 (1.83)*	-0.0506 (1.54)
Boardshare	-0.0422 (3.18)***	-0.0402 (3.15)***	-0.0376 (2.99)***	-0.0413 (3.27)***
Constant	-0.3490 (0.28)	0.9632 (0.81)	1.3491 (1.27)	0.8022 (0.79)
Chi square	35.75***	27.09***	28.05***	24.75***

*** significant at 1%; ** significant at 5%; * significant at 10%
t values in brackets

Q is the ratio of a firm's market value of equity plus total debt minus cash in the balance sheet to the book value of assets. FCF is operating cash flow minus interest, tax and dividends deflated by the market value of equity plus the book value of debt. Diversified is defined in terms of the entropy measure. Size is the natural log of total assets R&D is research and development expenditure as a percentage of sales. Boardshare is the total equity holdings of the directors. Age is the number of years quoted on the London Stock Market. Q_1Q_2 is the Q ratio in the year before going private (at the last published accounts) divided by the Q ratio in the previous year. LQ*HFCF is a dummy variable that takes a value of one if a firm had below median Q and above median free cash flow and zero otherwise. LQ*HDIVERSIFIED is a dummy variable that takes a value of one if a firm has below median Q and above median diversification and zero otherwise. Debt is the percentage of total debt deflated by total assets. Share Performance is the change in the share price minus the change in the FTSE All Share Index over the period one month prior to the announcement of the bid to twelve months before thatTax is the percentage of sales paid in tax.