

Going Private Buyouts and Private Equity: Bankruptcy Avoidance, Shareholder Gains and Turnaround*

Sudi Sudarsanam[†]

School of Management, Cranfield University

Cranfield MK43 0AL, United Kingdom

p.s.sudarsanam@cranfield.ac.uk

Mike Wright

Centre for Management Buy-out Research

Nottingham University Business School

Nottingham, NG8 1BB

Mike.Wright@nottingham.ac.uk

&

Jian Huang

School of Management, Cranfield University

Cranfield MK43 0AL, United Kingdom

jian.huang.phd.03@cranfield.ac.uk

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[†] Corresponding author

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Abstract

Using a sample of 236 UK companies that went from public to private (P2P) company status from 1997 to 2005, we study the impact of bankruptcy risk on the going private decision. We find that going private companies have significantly higher default probability. Private equity (PE) firms sponsoring P2P deals generate higher shareholder value gains when they acquire firms with higher risk of bankruptcy suggesting they are not deterred by the risk of financial distress but consider it a value creating opportunity. However, high bankruptcy risk at going private increases the chance the target will end up in receivership. Turnaround of P2P targets by PE investors thus depends on how seriously distressed they are at the P2P stage.

Keywords: going private; private equity; financial distress

Going Private Buyouts and Private Equity: Bankruptcy

Avoidance, Shareholder Gains and Turnaround

1. Introduction

A leveraged buyout (LBO) is an acquisition of a business mostly with cash, the cash being raised with a preponderance of debt issued by the acquirer. Going-private is a type of LBO where the shareholders in the publicly listed target are bought out, typically supported by private equity firms, and the company becomes privately owned. It is also known as a public-to-private (P2P) buyout. In the UK, P2Ps have become prominent during recent years. P2P transactions on average account for about 3% in deal number and 20% in value of total LBO activities (CMBOR, 2003). The increasing importance of P2Ps raises interesting questions about the motivations and expected sources of value creation that drive these deals. Many US studies, mainly relating to the 1980s, have reported substantial gains for target shareholders when P2P deals are announced (DeAngelo et al, 1984; Lehn and Poulsen, 1989; Kaplan, 1989; Marais et al, 1989; Frankfurter and Gunay, 1992; Travlos and Cornett, 1993) and empirically investigated the value sources.

Following a P2P deal, the concentrated equity ownership of the private equity (PE) sponsor and the high leverage are said to provide more effective managerial monitoring, thereby contributing to greater value creation than in the pre-LBO period characterised by divorce of management control from share ownership (Jensen, 1991). This argument is premised upon corporate governance failure in the pre-P2P firm. Several other explanations have been put forward as motivations for P2P LBOs and for their sources of value (Renneboog, Simons and Wright, 2007). Among these is the persistent undervaluation of target firms while being publicly listed. Such undervaluation increases the firm's cost of

capital and prevents them from pursuing valuable investment opportunities. Ownership by specialist PE firms may allow them to exploit valuable growth opportunities more effectively. This suggests that in the pre-P2P period the target may have experienced low growth and poor operating performance (Lehn and Poulsen, 1989; Kim and Lyn, 1991).

DeAngelo and DeAngelo (1987) argue that the advantages of going private include improved company performance, tax savings due to high leverage and potential improvement in the firm's competitive position. Going private deals may also result in better incentives for managers because of performance-driven incentive elements e.g. equity ratchet and stock options. However, the US empirical evidence on the factors influencing the going private decision is mixed and the sources of added value in P2P deals have not been clearly established (Lehn and Poulsen, 1989; Kaplan, 1989; Opler and Titman, 1993; Halpern et al, 1999). In the UK, while Weir, Laing and Wright (2005) investigate the possible motivations for P2P deals, they do not investigate the sources of shareholder value gains. Renneboog et al (2007) investigate the shareholder value effects and the determinants of these effects. They find that the main sources of shareholder wealth gains are undervaluation of the pre-P2P target firm, increased interest tax shields and incentive realignment.

This paper contributes to the literature by providing empirical evidence on the impact of bankruptcy risk faced by the P2P targets, an important issue not addressed directly by prior studies. Opler and Titman (1993) consider the impact of financial distress cost, measured by R&D intensity, on target shareholder value gains. R&D intensity, however, is not a reliable proxy for bankruptcy risk or distress costs. We employ direct measures of bankruptcy risk - default probability and proximity to default - estimated from stock market data using an option pricing model. A second neglected issue concerns whether PE firms successfully turn around distressed P2P targets. While a listed corporation with high bankruptcy risk may

present turnaround potential, this high risk when associated with the high leverage in PTP deals may increase the chances of its failure under PE ownership. This issue has assumed important policy interest with UK regulators expressing concern about the potential dangers of P2P transactions (Financial Services Authority, 2006). However, to date, there is no evidence to inform this debate. Thus, our second contribution is to provide new evidence on the relationship between bankruptcy risk of P2P targets and their subsequent fate under PE ownership.

A study of P2Ps in the UK is especially important for a number of reasons. First, the UK P2P market is second only to that of the US. Second, while the UK is superficially similar to the US as an Anglo-Saxon institutional environment, there are major differences between the two countries in terms of the regulation of takeovers, with the UK market focusing on self-regulation, where, for example, hostile bids face fewer obstacles in the form of frustrating action by target managements than in the US. Third, UK P2Ps make more use of privately placed mezzanine (subordinated) debt with different covenants, interest rates, etc., with junk bonds being very rare. Fourth, the leverage in UK P2P transactions is generally below that in US cases (CMBOR, 2006). Fifth, the UK tax regime relating to the treatment of interest on debt differs from that in the US³. Sixth, the closer link between the venture capital and buyout markets in the UK compared to the US means that UK deals are not confined to mature, cash-rich sectors. Seventh, there are marked differences between the creditor-friendly UK and the debtor-friendly US bankruptcy regimes (Citron, et al., 2006). Thus the characteristics, in particular, bankruptcy risk of targets, in P2P deals and how they influence subsequent exit in the UK may differ significantly from the US deals.

³ In the UK, “the tax regime relating to debt is the same for all companies, but affects private equity differently from other sectors because of private equity's greater use of debt.” (Treasury-Tenth Report, <http://www.parliament.the-stationery-office.com/pa/cm200607/cmselect/cmtreasy/567/56702.htm>)

Using a sample of 236 UK companies (i.e., all P2Ps for which information is available) that went private during 1997 to 2005, and a control sample of similar non-going private firms, we find that P2Ps have greater proximity to default. We also find that high bankruptcy risk provides an incentive for firms to go private but also generates larger shareholder gains than healthier target firms possibly because of the greater turnaround potential of such targets to the PE sponsors. We confirm other research that P2Ps have a lower market to book value ratio, a lower price/earning ratio, lower recent growth rate and smaller boards of directors than control firms. They are also relatively small and have suffered stock market neglect.

We report a cumulative abnormal return (CAR) of 15% for a 7 day announcement period (18% for a 21 day period) for PTP targets. The results are in line with US findings in the studies cited above as well as being comparable to target shareholder returns in takeovers in general in the UK (Sudarsanam, 2003, chapter 4). Shareholder gains are higher from targets with lower market to book ratios suggesting that pre-P2P undervaluation is an important source of value creation. High bankruptcy risk at going private increases the chance that the target will end up in receivership but this chance is reduced where managers hold larger shares or the P2P acquisition is a management buyout. Thus managerial alignment seems to improve the chances of turnaround.

The paper is organized as follows. Section 2 discusses the theories relating to the going private decision and develops the hypotheses that are subsequently tested. Section 3 describes the methodologies and data used in this research. Section 4 presents and discusses the results. Section 5 contains a summary of the empirical findings and suggestions for future research.

2. Theoretical framework for going private transactions

Traditional motivations identified in the literature include resolution of the agency problem in public corporations with diffused ownership and weak corporate monitoring by owners, unutilised debt capacity and associated tax advantages, reducing regulatory costs associated with publicly listed firms and correcting the undervaluation of the pre-P2P target firms.

2.1.1 Agency costs of equity

Free cash flow

In cash-rich, low-growth or declining sectors, management may be tempted to waste free cash flow through value-destroying investments (Jensen 1986, 1991). The close monitoring by PE sponsors after going private deny managers such self-indulgence. If this hypothesis holds, going private firms will have a lower growth rate and higher free cash flow than firms not going private. Evidence for the free cash flow hypothesis is mixed. Lehn and Poulsen (1989) and Opler and Titman (1993) provide evidence consistent with the free cash flow hypothesis, but Maupin et al (1984), Kieschnick (1998), and Servaes (1994) provide contradictory evidence. Neither Halpern et al. (1999) in the US nor Weir et al (2005) and Renneboog et al (2007) for the UK find that target firms suffer from excessive free cash flow. Halpern et al. (1999) find no impact on P2P likelihood of the lack of growth opportunities but Weir et al. (2005) find some evidence that P2Ps face lower growth opportunities.

Corporate governance

If the pre-P2P corporate governance structure is weak, the value gains that result from going private may be large. Private equity sponsors establish small boards with low executive management membership in their investee companies, typically replacing large and inefficient

boards (Jensen 1993; Denis, 1994). If going private is expected to improve corporate governance and hence shareholder value, we expect a positive relationship between board size and the going private decision as well as the abnormal return to shareholders from going private. However, a small board may also reflect small firm size and the greater power of executive directors to dominate the boards in these cases. In this event the expected relation is negative.

In the UK, the Cadbury Report and its successor the Combined Code (Cadbury, 1992 and Combined Code, 2003) prescribe splitting the roles of CEO and Chairman of the Board (COB), significant representation for independent directors and the creation of audit and remuneration committees. Boards dominated by powerful CEOs who are also COBs i.e. playing a duality of roles, are likely to have been weakly monitored in the pre-P2P period (Baliga et al, 1996; Brickley et al, 1997). Where there is a substantial presence of independent non-executive directors, monitoring is likely to have been strong (Dahya et al, 2002). The presence of audit and remuneration committees provide for more effective monitoring of executive management and management remuneration systems with a high degree of pay-for-performance sensitivity (Klein, 2002; Cohen et al, 2002). Thus absence of these mechanisms likely contributes to poor performance and undervaluation of the target firm, increasing the probability of a P2P bid and the value gains from the transaction. For the UK, Weir et al (2005) find that UK P2Ps have a higher frequency of duality, while Renneboog et al (2007) report that strong corporate governance monitoring of the pre-P2P target reduces the scope for value creation.

Management holding and going private decision

Managers with a low ownership stake in the pre-P2P target may see the deal as a way of increasing their ownership due to equity-based incentives and facilitate the P2P decision.

Thus, the probability of going private as well as that of value gains is likely to be negatively related to managerial ownership. When managers hold large ownership stakes in the pre-P2P target, they have a strong incentive and the power to promote a transaction from which they will gain immediately in the form of a takeover premium. However, if their large shareholding allows them to secure a favourable post-P2P dispensation in terms of share ownership or executive managerial positions, they might settle for a smaller bid premium. In management buyouts (MBOs) in which the target top managers are part of the acquiring team, this incentive is more compelling. The smaller the pre-P2P shareholding of target directors, the greater is the likely expropriation of gains from other target shareholders. Thus the relationship between probability of a P2P deal and managerial share ownership as well as between shareholder value gains and such ownership is *a priori* difficult to predict. Halpern (et al., 1999) find for the US that high managerial equity ownership makes a P2P more likely but that the relationship is non-linear. They also show that at both low and high prior managerial equity, the poorer the prior stock performance the higher is the premium received by target shareholders. For the UK, Weir et al (2005) find that going private firms are more likely to have higher CEO and institutional ownership. Renneboog et al (2007) find that lower managerial shareholding leads to higher gains suggesting that P2Ps provide the opportunity to improve managerial incentives and thereby generate more value for shareholders.

2.1.2 Regulatory costs for a public corporation

Public listing subjects companies to substantial and costly regulation by stock exchange and other authorities in terms of disclosure, documentation and corporate governance regime. Costs may outweigh benefits even for large, mature firms that have no need to access large risk capital from the stock market (Travlos et al, 1993). Going private saves these costs (DeAngelo et al, 1984). Travlos and Cornett (1993) for the US market suggest that there is no

significant relationship between abnormal returns and relative annual listing costs. For the UK, Renneboog et al (2007) find that high listing costs increase the value gains from P2Ps.

2.1.3 Stock undervaluation

Information asymmetry between managers and investors results in the undervaluation of the firm in the stock market. Going private eliminates this undervaluation because of the concentrated ownership and control by PE investors (DeAngelo et al., 1984; Jensen, 1991). Managements often argue that their reason for going private is the neglect they have suffered at the hands of investment analysts and investors. Institutional investors may prefer not to invest in small or medium sized firms and some of the undervaluation may be a reflection of the stock market illiquidity caused by this neglect. The low level of analyst following and lack of institutional investor interest compound the problem of information asymmetry further accentuating the undervaluation problem⁴. Renneboog et al (2007) find that one of the main sources of the wealth gains to pre-P2P shareholders is undervaluation of the pre-transaction target firm.

2.1.4 Debt tax benefits and bankruptcy risk

A firm that does not employ leverage up to its optimal level has more to gain from going private since it increases the firm's financial leverage and, therefore, potentially its stock value by increasing the firm's tax shields. Lowenstein (1985) argues that most of the premium paid to target shareholders in LBO deals is financed from tax savings. The scope for additional debt related savings would depend on the target's debt (service) capacity. High debt levels in going private LBOs commit cash flows to debt payment (Jensen, 1986). This

⁴ Undervalued or underperforming companies are more likely to become takeover targets of predators or other corporate managements who see an opportunity to turn the company around and enhance shareholder value. Management sometimes use LBO or P2P as a defensive tactic against hostile takeover bids (Halpern, Kieschnick and Rotenberg, 1999). However, Weir, Laing and Wright (2005) find no support for P2Ps being triggered by prior hostile takeover bids or takeover rumours.

reduces the free cash flow problem and increases the debt capacity of the post-PTP firm. The lower the pre-P2P debt level, the larger is the debt service capacity. Therefore, we expect to see a positive (negative) relationship between target debt capacity (target leverage) and the going private decision as well as the related shareholder value gains (Kim and Lyn, 1991). Halpern et al. (1999) find empirically that high leverage increases the P2P probability but high tax expenditure makes P2P transactions more likely. Renneboog et al. (2007) find for the UK that the increased interest tax shield due to unused debt capacity is one of the main drivers of gains to pre-P2P shareholders.

2.2 Bankruptcy risk and going private deals

2.2.1 Bankruptcy or financial distress avoidance as a motive to go private

Few of the above PTP studies examine bankruptcy avoidance as a motive for PTP and as a source of shareholder value gains. Opler and Titman's (1993) financial distress model argues that going private represents a trade-off between the potential gains from, for example, incentive realignment with resultant reduction in agency costs, and the possible costs of financial distress should the firm fail. Firm failure may be more likely following a buyout due to the higher debt burden. Opler and Titman (1993) consider financial distress cost, proxied by R&D intensity, as a factor *detering* a P2P buyout and lowering the shareholder value gains. R&D intensity, however, is not an accurate measure of bankruptcy risk or distress costs. We employ a more direct measure of bankruptcy risk and financial distress.

We also differ from Opler and Titman (1993) in arguing that firms experiencing financial distress or potential bankruptcy before the P2P may be *attractive* to PE investors. Such acquirers may find in distressed targets the opportunity to improve performance. Our review above suggests a number of reasons why post-buyout performance may improve,

thereby reducing bankruptcy risk. Undervalued P2P may also be bought more cheaply than financially healthy firms. Financially distressed firms may also not be highly leveraged thereby foregoing tax benefits. Incentive realignment from increased managerial equity stakes and improved governance may also help turnaround performance and reduce bankruptcy risk. Free cash flows tightly monitored by PE investors may also offset bankruptcy risk.

PE firms typically invest in those buy-outs which they can exit within two to five years. They trade off the downside risk of buying distressed firms against the upside potential of a successful turnaround and value gains. Therefore, we test the following hypotheses:

H1: P2P targets are more likely than non-P2P control firms to display financial distress or bankruptcy risk.

H2: Shareholder value gains to P2P targets are greater the higher the bankruptcy risk faced by them prior to the acquisition.

2.2.2 Outcome of bankruptcy risk

While financially distressed firms may be rescued from possible bankruptcy by PE acquirers, they also carry a higher risk that the expected turnaround in the post-P2P period may not be achieved. The high bankruptcy risk at the time of the P2P may doom the acquisition to failure leading to bankruptcy or receivership (we use these terms interchangeably in the rest of the paper)⁵ despite the turnaround capabilities of the acquirer. Hence, we test the following hypothesis:

H3: High bankruptcy risk at going private increases the chance that the target will end up in receivership.

⁵ Receivership refers to the UK bankruptcy process for distress firms.

We investigate how many of the P2P acquisitions subsequently result in such a dire outcome and how many avoid that fate. We also investigate the relationship between bankruptcy risk at the time of the P2P deal and the eventual exit through bankruptcy compared to other forms of exit such as return to the stock market, trade sale or a secondary buyout by MBO or MBI.

3. Data and methodology

3.1 Data collection

An almost complete population of 236 UK publicly listed companies that underwent public-to-private buy-outs during 1997 to 2003 are identified in the Thomson Financial's SDC database (only completed deals included) and the CMBOR database⁶. Table 1 below shows the number and value of going private deals by year.

{Insert Table 1 about here}

From our sample analysis, we observe that going private companies are drawn from various industries but the sample industry distribution pattern is very different from that of Financial Times Stock Exchange (FTSE) All Share Index firms. Most of the sample companies fall into the traditional industries like textiles, construction, restaurants and pubs, engineering and food producers (accounting for more than 26% of total sample), which is in line with the industry distribution from the US sample of Kim and Lyn (1991) where 30% sample fall into these three industries. For the entire sample, the median (mean) value of a going private deal is £62m (£122m) suggesting some large deals that skew the distribution.

⁶ Data non-availability as regards explanatory variables and stock returns restrict the usable sample size.

The mean and median values show an erratic pattern often being driven by single large deals e.g. the Debenhams deal in 2003.

A control sample is then constructed as a benchmark for the P2P sample. Some prior US studies are based on random selection of control firms (Kim and Lyn, 1991; Halpern et al, 1999). Non-random, matched sampling is also used in acquisition studies (Palepu, 1986). Prior research supports the view that most LBOs take place in mature industries (Lehn and Poulsen, 1989; Kieschnick 1989; Jensen 1991). Our sample presented above also conforms to this pattern. Therefore, in this research, similar to Denis (1992), we select the control firms by, first, industry and, then, size. Within each Datastream 2-digit SIC code industry, a matching company closest in terms of size i.e. sales revenue for each sample P2P company is selected. The selected control firm must continue to be listed on the London Stock Exchange (LSE) after the PTP of its sample counterpart.

3.2 Variables

Accounting data including sales growth, debt, size, free cash flow, and price to earnings ratio (PE) and market to book value ratio (MTBV) are taken from Datastream. Datastream also provides share price data for the calculation of abnormal returns. Corporate governance variables data come from the company annual accounts. Definitions of the variables used in the analysis are provided in Table 2.

{Insert Table 2 about here}

Dependent variables

Our analysis comprises two dependent variables. First, to identify the determinants of the going private decision we use a dummy variable that equals 1 where the firm is a P2P target

and 0 otherwise. Second, we measure the target shareholder wealth gains using cumulative abnormal returns (CARs), which are calculated for each sample firm for each event window. Using the Fama-French 3 factor (FFTF) model (Fama and French, 1993) to provide benchmark 'normal' returns, we estimate the abnormal return (AR) to both the sample and control firms each event day⁷. The daily abnormal returns and daily average abnormal returns are then calculated and then cumulated over days -4 to +2 relative to the bid announcement day, 0. These sample daily ARs and CARs are tested for statistical significance.

Independent variables

Our principal focus is on financial distress/ bankruptcy risk in P2Ps. Opler and Titman (1993) use the target R&D/sales to proxy for the financial distress costs. In this study, we also employ INTANGIBLES that include capitalised R & D costs and other intangible assets as another measure of potential distress costs. The higher the intangibles intensity, the lower is the probability of a P2P and therefore the smaller the value gains to target shareholders⁸.

We calculate the default probability (DFTPRBLTY) as our direct proxy for financial distress and bankruptcy risk. According to Black and Scholes (1973) and Merton (1974), equity is equivalent to a long position on a call option with strike price equal to the face value of debt while debt is equivalent to a long position on a risk-free bond and a short position on a

⁷ In estimating the FFTF, we employ the one-month Treasury bill rate as the risk free rate, the Financial Times All Share (FTA) index return as the market proxy R_{mt} . The return to the size (SMB) factor is the average return on the three small portfolios minus the average return on the three big portfolios. The return to the market to book (HML) factor is the average return on the two value portfolios minus the average return on the two growth portfolios. SMB and HML for July of year t to June of t+1 include all LSE stocks for which we have market equity data for December of t-1 and June of t, and (positive) book equity data for t-1. The FFTF model is estimated by OLS estimates of the market model from a regression over 252 days (or at least 60 days) starting 46 days prior to the announcement of the going private deal.

⁸ Unlike in the US, some R&D costs may be capitalised in the UK. High intangible intensity may cause serious undervaluation because of the complexity of the intangible valuation process. It may also reduce debt service capacity since intangibles are not available to collateralise debt in an LBO.

put option with strike price equal to the face value of debt. Debt holders get paid fully if, and only if, the firm's assets exceed the face value of debt; otherwise, the firm defaults on debt payments and may be forced into liquidation. In bankruptcy, equity holders, as the residual claimants, get paid only after debt holders. Therefore, the probability that firm value does not exceed the face value of debt can be regarded as the default probability.

Specifically, given the standard assumptions underlying the Black-Scholes option pricing formula, the default probability in period t for a horizon of T years can be calculated as⁹:

$$P_T = N \left[- \frac{\ln \frac{V_A}{D} + (\mu - \frac{1}{2} \sigma_A^2) T}{\sigma_A \sqrt{T}} \right] \quad (1)$$

where N is the cumulative normal distribution, V_A is the firm's asset value at the calendar year end and D is book value of the total liability¹⁰ of the event firm (and its corresponding matched control firm) before the announcement of the going private deal; r is the annualised contemporary 1-month UK Treasury bill rate; σ_A is asset volatility.

A related measure of bankruptcy risk is the proximity or distance to default (DD). DD is the number of standard deviations of standard normal distribution that the firm is away from bankruptcy, where the cut-off point for bankruptcy is zero¹¹ According to Chan-Lau (2006), distance to default is an accurate predictor of corporate defaults.

Control variables

⁹ We derive the default probability formula in equation 1 in Appendix A.

¹⁰ We also estimate D as book value of short term liability plus half of long term liability, similar to what is suggested in KMV model (see Chan-Lau, 2006); the empirical results are qualitatively similar. Our measure of D implies a more rigorous estimate of bankruptcy risk.

¹¹ The cut-off point indicates default, i.e., $V_A < D$

In testing our hypotheses, we also control for the differential characteristics of P2P targets and control firms identified in Section 2.1. Market value to book value of equity (MTBV) is a proxy for stock market valuation¹². We have two alternative proxies for stock market neglect. The first, ANALYSTS, is the number of analysts following the P2P and control firms just prior to the P2P announcement. The second, ANALDUM, is a dummy variable equal to 1 where ANALYSTS is above the total sample median and 0 if equal to or below that median. A low value of either variable indicates high market neglect. OPTCASH, based on the 3 year average operating cash flow to total assets is the target's pre-P2P operating performance indicator. We use several proxies for managerial incentives and corporate governance structure. The board size is proxied by the number of directors (BOARDSIZE) and the degree of independence in monitoring managers by the proportion of non-executive directors (PNONE). The ability of the board to monitor is also captured by AUDCOMM, the variable to indicate the presence of audit committees. The dominance of the CEO is measured by a dummy variable, CEO-COB duality (DUALITY). Managerial incentives are captured by the percentage of shares held by executive directors (EXECSHARE). It has been argued that managerial shareholding may promote alignment at low levels but entrenchment at high levels (Morck et al, 1988, McConnel and Servaes, 1990; Sudarsanam et al, 1996). We therefore also use EXECSHARE² to capture this nonlinearity. Debt ratio (DEBT/TA) is a balance sheet measure of debt service capacity with a low value pointing to high unused debt service capacity and scope for high and beneficial tax shields after the P2P. We employ another, income statement-based, proxy EBITDA/ INTEREST to measure debt service capacity. This ratio is high when the target is under-leveraged i.e. it has surplus debt service capacity. We also include the enterprise value multiple as a measure of target value. EV/EBITDA is popularly used as a valuation measure

¹² We also report tests based on the price-earnings ratio as an alternative to MTBV.

in acquisitions, especially in LBOs. A low EV/EBITDA indicates that a firm may be undervalued.

3.2 Methodology

We first carry out a univariate analysis of the various characteristics of the P2P and control samples and test for the difference in means and medians between the two using t statistics and z statistics respectively. Both independent sample and non-parametric tests are employed to mitigate the impact of outliers. We then extend our analysis to the going private decision using the multivariate logistic regression model. The logit model estimates the parameters using maximum likelihood methodology. The overall measure of the model fit is given by the Wald Chi-square statistic. We regress the announcement period CARs on the pre-P2P target characteristics to explain the sources of value gains.

4. Results

4.1 Univariate analysis of factors determining the going private decision

Table 3 presents the results of univariate analyses of the differences in pre-P2P characteristics of target firms and a control group of same industry firms that remain public companies. Targets are significantly slower growing than the listed firms in terms of the median sales growth rate. Target firms face a significantly higher level of bankruptcy risk with both their mean and median default probability (DFTPRBLTY) than those firms that stay listed. Similarly, compared to control firms, targets also have significantly shorter distance to

default, which means they are more likely to default in one year's time than their matched firms¹³.

{Insert Table 3 about here}

The median enterprise multiple of the going private firm is significantly lower than that of the control firm, indicating that the going private targets might be undervalued. None of the mean differences in debt capacity ratios is significant but median EBITDA/INTEREST is significantly lower than in listed firms. These suggest no greater debt capacity in going private targets. Thus potential tax benefits from using unused debt service capacity may not exist for the going private firms unless post-P2P the performance of the target firms improves. There is strong evidence that targets have much lower price earnings multiples than the listed firms. They also have much lower market to book value multiples although in this case only the median differences are significant. The median enterprise value multiple of the targets is also significantly smaller. These ratio differences support the undervaluation proposition.

However, targets are no different from control firms in their intangible asset intensity. There is strong evidence that target firms have suffered market neglect. While the average (median) number of analysts following the listed firms is 6.9 (4.0), the corresponding number for the target firms is 3.6 (2.0). The mean and median differences are both strongly significant at the 1% level. With ANALDUM as a proxy for market neglect, we find similar and equally significant differences in analyst following.

There is evidence that going private firms have significantly smaller boards but there is no significant difference in the proportion of non-executive directors between the two

¹³ It may be argued that incumbent managers who join the PE sponsor in the acquisition may hide the true bankruptcy risk in order to avoid a high acquisition premium. This may be reflected in higher bankruptcy risk in the MBO deals than in non-MBO deals. In an unreported univariate test, the difference in default probabilities and distance to default between MBO and other types of going-private transactions is statistically insignificant, suggesting no information asymmetries between the managers and the market in our sample.

groups. 16% of the targets firms have joint CEO-COB executives while 17% of control firms have joint CEO-COB executives with the difference being insignificant. 93% of both groups have audit committees. The differences in median and mean executive director's shareholdings between going private firms and non-going private firms are insignificant.

Overall, the univariate analysis provides significant support for the market undervaluation and market neglect motives. This undervaluation may be partly attributable to the poorer operating performance, slower growth of the target firms and greater bankruptcy risk they face. But the observed undervaluation may also be due to the greater market neglect of these firms. There is some evidence of an efficient corporate governance structure, i.e. smaller boards. But there is no unambiguous indication of governance failure in target firms. There is no evidence of greater debt capacity.

In Table 4, we further study the range of different default probability levels associated with credit quality embodied in Moody's rating categories¹⁴. According to Moody's KMV model, firms with default probability lower than 2 basis points¹⁵ are highly unlikely to go bankrupt within one year¹⁶ (Chan-Lau, 2006). Aaa rated firms fall in this category. Similarly, we regard firms with default probability higher than 400 basis points as the firms that are highly likely to go bankrupt within one year. Ca rated firms fall in this group including, 20 out of 199 of our sample firms.

{Insert Table 4 about here}

4.2 Results of multivariate analysis of target characteristics

¹⁴ See Table 4 for further Moody's rating categories and our classification of sample firms,

¹⁵ One basis point (bp) equals to 0.0001. The KMV model expresses default probability in basis point.

¹⁶ Unlike Moody's KMV model which relies on its unique empirical distribution, we use normal distribution to approximate the default probability. Hence, our empirical results here are only indicative.

We run multivariate logistic regression models to identify the determinants of the going private decision. Some of the explanatory variables listed in Table 3 are not included in the initial model reported in Table 5 but are discussed later under *Robustness checks*¹⁷. The model is overall significant at the 1% level. The model does not suffer from any significant multicollinearity¹⁸.

{Insert Table 5 about here}

The results show that companies with higher bankruptcy risk are more likely to go private, consistent with the univariate analysis results. According to Table 5, one standard deviation increase in distance to default (DD) decreases the odds of going private by 19% (Model 2). This supports our hypothesis *H1*.

Highly leveraged firms are less likely to go private, probably because they have little unused debt capacity. This result seems to contradict the result on default probability since a high leverage firm is more likely to default. We also find support for market neglect as an incentive for going private. The smaller the number of analysts that follow the target, the greater is the likelihood of going private. Firms with higher managerial shareholding (EXECSHARE) are more likely to go private. However, it has a diminishing marginal impact as the coefficient of EXECSHARE² is significantly negative. The percentage of non-executive directors on board is also related positively to the likelihood of going private. The impact of other corporate governance mechanisms including board size, CEO duality and audit committee, is insignificant. The P2P bids seem driven primarily by higher bankruptcy

¹⁷ We also include year dummy to account the variants across different years. The coefficients on the year dummies are statistically insignificant indicating that the odds of going private do not vary across years.

¹⁸ This is tested by the variance inflation factor (VIF) statistics (see Gujarati, 2003, pp362-3). This factor for all the variables is about 2 or less except with EXECSHARE² and EXECSHARE for obvious reasons. For these two variables VIF is about 10 which is the level when collinearity becomes a moderately serious problem. Thus our model is quite robust to multicollinearity.

risk, greater market neglect, and higher managerial incentives from stock ownership, and greater board independence of the target firms than in firms that remain public companies.

In an unreported analysis, we also ran another logit model with EXECSHARE as a simple linear term and with the free cash flow variable, CASH¹⁹. In this model, again DD and EXECSHARE, are significant with the same signs on the coefficients. Overall, the P2P determinants relating to bankruptcy risk are robust to different model specifications.

4.3 Shareholder value performance

We measure shareholder wealth gains in terms of CARs over the event window (-4, +2 days)²⁰ and event window (-10, +10 days). According to Table 6, the mean (median) 7-day CAR to target shareholders is 15% (11%) and significant at 1%. The mean (median) 21-day CAR to target shareholders is 18% (15%) and significant at 1%. From these estimates, it is clear that P2P buyouts generate significant value gains for incumbent shareholders. To the extent that the bidders pay such significant premia to target shareholders out of the value they expect to create after the P2P transactions, the transactions themselves are value creating ones. The evidence of the abnormal returns generated around announcement period in this research is in line with evidence found in the studies on P2P deals cited in Section 2.1 and in other UK mergers and acquisitions (Sudarsanam, 2003, ch. 4) and supports the argument that going private transactions create substantial value for their shareholders.

{Insert Table 6 about here}

¹⁹ Free cash flow is defined as operating cash flow minus interest and cash dividends paid minus investment on tangible assets over total sales in the accounting year prior to PTP announcement

²⁰ From an analysis of abnormal returns over the window (-20, +20 days) centred on the announcement date, day 0, we observe that almost all significant daily abnormal returns are limited to the event window (-10, +10 days) with the strongest impact within (-4, +2 days). We hence use CAR (-4, +2) in our main analysis and CAR (-10, +10) for robustness check.

In an unreported analysis, we also examine whether there are significant differences in wealth gains between P2P groups classified according to bid hostility²¹, whether the deals are MBOs²², the extent of market neglect, and the extent of undervaluation. Differences in CARs between hostile and friendly P2P offers, between MBOs and non-MBOs, between targets with high and low analysts following and between undervalued and overvalued targets are insignificant.

4.4 Abnormal returns and pre-P2P characteristics

To obtain additional insights into how the pre-P2P characteristics of target firms determine the shareholder value gains, we run multivariate regressions of the CARs on the variables defined in Table 2. Results are presented in Table 7.

{Insert Table 7 about here}

The model does not suffer from any significant multicollinearity²³. We find that targets with a higher bankruptcy risk do not generate higher shareholder gains. Our hypothesis *H2* is therefore not supported. While high bankruptcy risk seems to motivate the going private decision, it does not enable target shareholders to negotiate a higher takeover premium from PE bidders. Higher enterprise multiple (EV/EBITDA) is associated with lower announcement abnormal return. Targets already highly valued for their cash flow seem to receive a lower bid premium. Our analysis also shows that high operating cash flow enhances shareholder value gains. Under-valued targets i.e. with lower market-to-book ratio generate more value gains.

²¹ A bid is regarded as hostile if it is indicated by SDC as hostile in the initial reception field.

²² That is, insider management driven deals as opposed to IBOs or MBIs that are driven by outside financiers or management.

²³ This is tested by the variance inflation factor (VIF) statistics (see Gujarati, 2003, pp362-3). This factor for all the variables is about 2 or less, well below the level of 10 when collinearity becomes a moderately serious problem. Thus our model is quite robust to multicollinearity.

According to Model 2, it is targets with higher debt capacity (high EBITDA/INTEREST) that generate less value for target shareholders, inconsistent with the debt capacity hypothesis.

Corporate governance structure also contributes to the shareholder value creation in going private deals. Target boards with higher percentage of non-executive directors can generate more shareholder value. Recall that in the logit results reported in Table 4, this board structure also has a positive impact on the likelihood of going private. Non-executive directors are able to generate more shareholder value probably by negotiating more favourable terms for incumbent shareholders. This suggests that non-executive directors in the UK keep a watchful eye on P2P deals that can often generate conflicts of interest between management and shareholders where managers have large shareholding or are part of the buyout team, e.g. in a MBO. However, in an unreported regression with the interactive term, NONEXEC * MBO, we find the coefficient is positive but insignificant.

4.5 Bankruptcy risk and subsequent bankruptcy

High bankruptcy risk that provides PE investors with the challenging opportunity to create value through turnaround is shown by our preceding analysis as a major determinant of the going private decision. Given this evidence, the question arises about the fate of these high risk investments. Do they end up in actual bankruptcy? If so, we can expect a significant relationship between the default probability or DD at the going private stage and eventual exit by the private equity sponsor through bankruptcy. In the next stage of our analysis, we follow up the completed deals and track their exit mode using the CMBOR database. Specifically, we classify exit mode into five distinct categories, i.e.

- bankruptcy or receivership,
- IPO on a stock market,

- trade sale to a corporate buyer,
- secondary buyout via, say, MBO or MBI to another private equity firm, and
- none, where none indicates that the targets are still held by PE investors.

Panel A of Table 8 shows the holding period of the targets by the PE investors. In the case of None, we calculate the holding period of these firms till the end of 2005. There are no significant differences in holding periods across different exit modes. Panel B of Table 8 classifies the default probability and distance to default into the five aforementioned categories. As expected, the targets that end up in receivership as exit mode have the highest default probability at the time of the P2P, amounting to 376 basis points (highest probability) and 2.76 standard deviations to the default threshold (shortest distance). In Panel C of Table 8, we examine the default probability of the target firms that end up in receivership. There are two extreme cases which have default probability more than 10% percent (over 1000 basis points). This indicates that our default probability measures have fair predictability.

{Insert Table 8 about here}

We also track the exit mode of the targets with high default probability in Table 9. As shown in Table 9, over the sample period, 2 out of 18 targets that have default probability over 400 basis points end up in bankruptcy. There are 2 cases of IPO and 1 case of trade sale. Most of the targets, however, are still held by the PE investors. It is not clear whether the continued holding of these investments is voluntary because they have been turned around or involuntary because the PE investors are nursing them in intensive care and are loath to declare their demise.

{Insert Table 9 about here}

Further, in Table 10, we run a logistic regression to study the determinants of the probability of the targets exiting through receivership. In Model 1, distance to default has good predictive power as regards the receivership exit mode. The Wald Chi-Square of model 2 in Table 10 is insignificant. In Model 2 also distance to default still holds good predictive power for the receivership exit mode. P2P targets with a high bankruptcy risk are also more likely to go bankrupt under PE ownership. This suggests that the turnaround capabilities of PE firms are not adequate to turn around these very distressed firms. Higher debt capacity (as indicated by EBITDA/INTEREST) before going private is associated with higher probability of ending up in receivership. We conjecture this may be because the PE sponsors overexploit the high debt capacity and push the leverage too high. Regarding corporate governance, targets with a higher proportion of non-executive directors before going private face shorter odds of exit through receivership. Firms that have a higher level of monitoring prior to P2P seem more able to avoid the bankruptcy under PE ownership. Target firms that are bought out through a MBO are less likely to go bust after the deal. Since MBOs promote greater alignment between managers and PE investors, this result is consistent with reduced agency problems allowing more enhanced performance and reduced bankruptcy risk.

{Insert Table 10 about here}

5. Summary and conclusions

This study examines the recent going private transactions in the UK and empirically examines the possible motivations for the going private transactions. It also examines whether going private transactions are value creating for shareholders and what the sources of this added value are. The primary focus of this paper is whether bankruptcy avoidance is a motive for going private. By the same token, do private equity investors buy targets facing high bankruptcy risk in the hope of exploiting the opportunity for turnaround and substantial

upside gains? We study the exit mode of the going private deals, in particular, through bankruptcy. We investigate whether high bankruptcy risk at the time of the P2P transaction dooms the acquisition to subsequent failure. We investigate whether or not firms that have gone private have different characteristics from firms which stay listed on the stock market at that time.

For a sample of 236 going private acquisitions in the UK during 1997-2005, almost the entire population, we find, in contrast to Opler and Titman (1993) in the US, that bankruptcy risk does not deter PE firms from P2P deals. Indeed, we find that such risk raises the chances of a P2P buyout. PE acquirers seem to regard target's poor performance as a turnaround opportunity. Several empirical studies in the US evidence that going private companies are companies with lower growth rate, higher level of free cash flow and smaller size than firms that remain public companies and are usually undervalued by the market. In this research, we find that going private firms are less valued, smaller and lower growth than firms in the same industries that remain public companies. We also find greater market neglect in the form of low analysts' following contributes to the going private decision. We find evidence that top management shareholding has a significant, and nonlinear, impact on the going private decision. Whether the incumbent is part of the acquirer, as in an MBO, is of relevance to shareholder value gains from P2P deals. We have no evidence that MBOs transfer value to managers from shareholders.

We find that P2P transactions are value creating and target shareholders enjoy wealth gains of up to 18%. This supports the findings in previous research using US and UK data. We find that these value gains are not significantly larger for targets that are comparatively poor performers facing a higher degree of bankruptcy risk. However, we do find that the shareholder gains are greater for firms with larger operating cash flow and which are more

undervalued by the stock market. We find that many of the factors that influence the going private decision do not impact the value gains. It is therefore important for the understanding of the going private phenomenon that researchers investigate both the motives for going private and how going private is likely to create value. For example, while we find market neglect a significant determinant of the going private decision, it has no impact on the takeover premium target shareholders receive.

This study has investigated only some of the possible motivations and sources of value. Other motivations such as any wealth transfer from other stakeholders such as lenders (Travlos and Cornett, 1993) and government through tax savings (Lowenstein, 1985) are areas for further research. Similarly, future research could employ more direct proxies for listing costs and tax benefits and other proxies for market neglect e.g. institutional portfolio allocation.

We find evidence that high bankruptcy risk at going private increases the chance that the target will end up in receivership. In these cases turnaround efforts of the PE investors seem to have failed. This highlights the risky nature of P2P deals when the motivation is the turnaround opportunity. However, where there are more non-executive directors or the P2P acquisition is a MBO, the probability of bankruptcy is reduced indicating either better monitoring by independent directors or greater alignment of interests between managers and PE investors.

We have investigated one aspect of post-P2P performance i.e. the exit into bankruptcy. Other aspects of post-P2P performance and the factors that contribute to enhanced performance and turn around need researching. Post-PTP performance analysis is important to bring insights concerning the benefits of going-private transactions and would also help to answer the question whether the same benefits could be achieved without going private.

References

- Baliga, B. R., Moyer, R.C., Rao, R.S., 1996. CEO duality and firm performance: what's the fuss? *Strategic Management Journal* 17, 41-53.
- Barber, B. M., Lyon, J.D., 1997. Detecting long run abnormal stock returns: The empirical power and specification of test statistics. *Journal of Financial Economics* 43, 341-372.
- Black, F., Scholes, M., 1973. The pricing of options and corporate liabilities. *Journal of Political Economy* 81, 637-654.
- Brickley, J., Lease R., Smith, C. W., 1998. Ownership structure and voting on antitakeover amendments. *Journal of Financial Economics* 20, 267-291.
- Cadbury, 1992. *Cadbury Report: the Financial Aspects of Corporate Governance*. London: Financial Reporting Council, United Kingdom.
- Chan-Lau, J. A., 2006. Market-based estimation of default probabilities and its application to financial market surveillance. IMF working paper.
- Citron, D., Wright, M., Rippington, F., Ball, R., 2006. Bankruptcy costs, leverage and multiple secured creditors: the case of MBOs. Paper presented at the Multinational Finance Conference, Edinburgh, June.
- CMBOR, 2006. The UK buy-out market. *Management Buy-outs: Quarterly Review* from CMBOR. CMBOR: University of Nottingham.
- Cohen J., Krishnamoorthy, G., Wright, A.M., 2002. Corporate governance and the audit process. *Contemporary Accounting Research* 19, 573-94.

Financial Services Authority, 2003. The Combined Code on Corporate Governance. London: Financial Services Authority, United Kingdom.

Dahya, J., McConnell, J.J., Travlos, N.G., 2002. The Cadbury Committee, corporate performance and top management turnover. *Journal of Finance* 57, 461-83.

DeAngelo, H., DeAngelo, L., 1987. Management buyouts of publicly traded corporations. *Financial Analysis Journal* 43, 38-49.

DeAngelo H., DeAngelo, L., Rice, E., 1984. Shareholder wealth and going private. *Journal of Law and Economics* 27, 367-402.

Denis, D. J., 1992. Corporate investment decisions and corporate control: Evidence from going-private transactions. *Financial Management* 21, 80-94.

Denis, D., 1994. Organizational form and the consequences of highly leveraged transactions, Kroger's recapitalization and Safeway's LBO. *Journal of Financial Economics* 36, 193-224.

Fama, E., French, K., 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics* 33, 3-56.

Fama, E., Jensen, M., 1983. Separation of ownership and control. *Journal of Law and Economics* 26, 301-349.

Financial Services Authority, 2006. Private equity: a discussion of risk and regulatory engagement. Discussion Paper DP06/6. London: Financial Services Authority.

Frankfurter, G. M., Gunay, E., 1992. Management buy-out: The sources and sharing of wealth between insider and outsider shareholders. *Quarterly Review of Economics and Finance* 32, 82-95.

Gujarati, D., 2003. *Basic Econometrics*, New York:McGraw Hill.

Halpern, P., Kieschnick, R., Rotenberg, W. 1999. On the heterogeneity of leveraged going private transactions. *The Review of Financial Studies* 12, 281-309.

Hillegeist, S. A., Keating, E.K., Cram, D.P., Lundstedt, K.G., 2004. Assessing the probability of bankruptcy. *Review of Accounting Studies* 9, 5–34.

Jensen, M., Meckling, W. 1976. Theory of the firm: Managerial behavior, agency cost, and ownership structure. *Journal of Financial Economics* 3, 305-360.

Jensen, M., 1986. Agency costs of free cash flow, corporate finance and takeovers. *American Economic Review* 76, 323-329.

Jensen, M., 1989. The eclipse of the modern corporation. *Harvard Business Review* 89, 61-74.

Jensen, M., 1991. Corporate control and the politics of finance. *Journal of Applied Corporate Finance* 4, 13-33.

Jensen, M., 1993. The modern industrial revolution: Exit, and the failure of internal control systems. *Journal of Finance* 48, 831-880.

Kaplan, S., 1989. The effects of management buyouts on operating performance and value. *Journal of Financial Economics* 24, 217-54.

Kieschnick, R., 1998. Free cash flow and stockholder gains in going private transactions revisited. *Journal of Business Finance and Accounting* 25, 187-202.

Kim, W., Sorensen, R., 1986. Evidence on the impact of agency cost of debt on corporate debt policy. *Journal of Financial and Quantitative Analysis* 21, 131-144.

Kim, W. S. and Lyn, E., 1991. Going private: Corporate restructuring under information asymmetry and agency problems. *Journal of Business Finance and Accounting* 18, 637-648.

Klein, A., 2002. Audit committee, board of director characteristics and earnings management. *Journal of Accounting and Economics* 33, 375-400.

Lehn, K., Poulsen, A., 1989. Free cash flow and stockholder gains in going private transactions. *Journal of Finance* 44, 771-788.

Lowenstein, L., 1985. Management buyouts. *Columbia Law Review* 85, 730-784.

Marais, L., Schipper, K., Smith, A. 1989. Wealth effects of going private for senior securities. *Journal of Financial Economics* 23, 155-191.

Maupin, R., Bidwell, C., Ortegren, A., 1984. An empirical investigation of the characteristics of publicly-held corporations that change to private ownership via management buyouts. *Journal of Business Finance and Accounting* 11, 345-359.

McConnell, J., Servaes, H., 1990. Additional evidence on equity ownership and corporate value. *Journal of Financial Economics* 27, 595-612.

Merton, R. C., 1974. On the pricing of corporate debt: The risk structure of interest rates. *Journal of Finance* 29, 449-470.

Morck, R., Shleifer, A., Vishny, R., 1988. Characteristics of targets and friendly takeovers, in A Auerbach (ed); *Corporate takeovers: Causes and consequences*, (Chicago: University of Chicago Press).

Opler, T., Titman, S., 1993. The determinants of leveraged buyout activity: Free cash flow vs. financial distress costs. *Journal of Finance* XLVIII, 1985-1999.

Palepu, K., 1985. Predicting takeover targets: A methodological and empirical analysis. *Journal of Accounting and Economics* 8, 3-35.

Renneboog, L., Simons, T., Wright, M., 2007. Why do public firms go private in the UK? The impact of private equity investors, incentive alignment and undervaluation. *Journal of Corporate Finance* 13(4), 591-628.

Servaes, H., 1994. Do takeover targets overinvest? *Review of Financial Studies* 7, 253-277.

Sudarsanam, S., 2003. *Creating Value from Mergers and Acquisitions: The Challenges*. London: FT Prentice Hall.

Travlos, N., Cornett, M., 1993. Going private buy-outs and determinants of shareholders' returns. *Journal of Accounting, Auditing and Finance* 8, 1-25.

Weir, C., Laing, D., Wright, M., 2005. Incentive effects, monitoring mechanisms and the threat from the market for corporate control: an analysis of the factors affecting public to private transactions in the UK. *Journal of Business Finance & Accounting* 32, 909-944.

Wright, M., Renneboog, L., Simons, T., Scholes, L., 2006. Leveraged buyouts in the UK and Continental Europe. *Journal of Applied Corporate Finance* 18, 38-55.

Appendix A: Estimation of Default Probability

Following option pricing theory (Black-Scholes and Merton?), we assume that firm's asset value follows stochastic process:

$$dV_A = \mu V_A dt + \sigma_A V_A dW_t \quad (\text{A.1})$$

where V_A and dV_A are the firm's asset value and change in asset value respectively; μ , and σ_A are the firm's asset value drift rate and volatility; dW_t is a Wiener process. We calculate the default probability, P_T by T , as the probability that the market value of the firm's assets value will be less than the face value of the firm's liability by the time the debt matures, i.e., time T . This can be expressed as:

$$P_T = \Pr[V_A \leq D | V_A^0 = V_A] = \Pr[\ln V_A \leq \ln D | V_A^0 = V_A] \quad (\text{A.2})$$

where V_A is the current market value of assets; and D the face value of the firm's total liabilities due at time T ; and

$$V_A^T = V_A \exp\left[\left(\mu - \frac{1}{2}\sigma_A^2\right)T + \sigma_A \sqrt{T}z\right] \quad (\text{A.3})$$

where μ is the expected return on firm assets and z its random component following a normal distribution with zero mean and unit variance. After log transformation, we have

$$\ln V_A^T = \ln V_A + \left(\mu - \frac{1}{2}\sigma_A^2\right)T + \sigma_A \sqrt{T}z \quad (\text{A.4})$$

Substituting equation A.4 into equation A.2 and re-arranging, we obtain:

$$P_T = \Pr\left[-\frac{\ln \frac{V_A}{D} + \left(\mu - \frac{\sigma_A^2}{2}\right)T}{\sigma_A \sqrt{T}} \geq z\right] \quad (\text{A.5})$$

Following Black and Scholes (1973) and assuming z_t is normally distributed, $z_t \sim N(0, 1)$, the default probability is:

$$P_T = N \left[- \frac{\ln \frac{V_A}{D} + (\mu - \frac{1}{2} \sigma_A^2) T}{\sigma_A \sqrt{T}} \right] \quad (\text{A.6})$$

Note that the term within the parentheses of equation A.7 is the distance-to-default (DD), which is the number of standard deviations that the firm is away from default level.

The estimation of DD and P_T requires the knowledge of the firm's assets value and firm's assets volatility, which are not directly observable. Crosbie and Bohn (2005) suggest solving a non-linear two equations system simultaneously to estimate V_A and σ_A . Since, equity value is equivalent to a long position on a call option with strike price equals to the face value of debt (Merton, 1974), we have:

$$V_E = V_A N(d_1) - D e^{-rT} N(d_2) \quad (\text{A.7})$$

where $d_1 = \frac{\ln \frac{V_A}{D} + \left(\mu + \frac{\sigma_A^2}{2} \right) T}{\sigma_A \sqrt{T}}$, $d_2 = \frac{\ln \frac{V_A}{D} + \left(\mu - \frac{\sigma_A^2}{2} \right) T}{\sigma_A \sqrt{T}}$, and r is the risk free rate.

Equity and asset volatility are related by the following equation:

$$\sigma_E = \frac{V_A}{V_E} N(d_1) \sigma_A \quad (\text{A.8})$$

We implement the Gauss-Seidel iteration technique in solving the non-linear equations system (A.7 and A.8).

We measure V_E as the market capitalization of the going private target at the end of the calendar year immediate before announcement of the going private deal. σ_E is the stock

prices volatility during the calendar year prior to the going private deal. r is the annualized contemporary 1-month Treasury Bill rate. We employ alternative measures of debt. Specifically, we use book value of total liability as the main measure of D . We also use total debt, (total debt + short term liabilities – cash on balance sheet), and (short term liabilities + half long term liabilities) as alternative measures. Similar to V_E , D is measured at the end of calendar year immediate before the announcement of the going private deal. Finally, according to common practice, (Hillegeist et al., 2004; and Chan-Lau, 2006), we set T to 1 in our calculation to estimate the default probability of the firm in one year time.

Table 1: Annual sample distribution of P2P targets & Mean and median values of P2P transactions**by year**

The sample comprises of 236 UK going private deals from 1997 to 2005. Within the sample, the transaction value is available for 213 deals. An MBO involves the manager of a target business as equity investors with the PE firm in the acquisition vehicle.

Panel A: P2P transaction value by year					
Year	Observations	Mean (£ M)	Median (£M)	Std. (£ M)	Total (£ M)
1997	7	50.96	35.90	39.49	356.74
1998	27	95.26	19.80	216.61	2286.25
1999	44	137.50	54.00	238.51	6050.06
2000	35	240.97	59.60	599.35	8434.10
2001	26	103.21	69.00	106.20	2373.75
2002	32	103.61	24.70	206.79	2383.05
2003	36	156.14	18.70	339.95	5465.02
2004	12	221.09	69.80	467.70	2432.02
2005	16	371.80	298.00	357.76	4089.80
Total	235	159.02	49.70	346.48	33871.26

Panel B: P2P Transaction value by deal type					
	Observations	Mean (£ M)	Median (£M)	Std. (£ M)	Total (£ M)
MBO	99	212.75	59.3	442.90	21062.25
NonMBO	136	127.32	43.75	253.06	17315.52

Table 2: Definitions of explanatory variables

See section 3 for details on the data sources.

Variables	Definitions
DFTPRBLTY	<p>Default probability based on market data. According to Merton (1974), the default probability of a particular firm in period t for a horizon of T years can be calculated as $P_T = N \left[-\frac{\ln \frac{V_A}{D} + (\mu - \frac{1}{2} \sigma_A^2)T}{\sigma_A \sqrt{T}} \right]$ where N is the cumulative normal distribution, V_A is the current assets value, D is the book value of total liability, r is the risk-free rate, and σ_A is the asset volatility. (See Appendix A for the details)</p>
DD	<p>Distance to default, $\left[-\frac{\ln \frac{V_A}{D} + (\mu - \frac{1}{2} \sigma_A^2)T}{\sigma_A \sqrt{T}} \right]$, is used as an alternative proxy for financial distress is the number of standard deviations of standard normal distribution that the firm is away from bankruptcy, where the cut-off point for bankruptcy is zero.</p>
OPTCASH	Average of the ratios of operating cash flow over total assets 3 years prior to P2P from the most recent annual accounting statements
EV/EBITDA	Enterprise value over earning before interest, tax, depreciation and amortization in the accounting year prior to P2P announcement. Enterprise value is estimated by the formula: market capitalization at fiscal year end date + preferred stock + total debt minus cash
DEBT/TA	Total debt (net of cash) over total assets (net of cash) in the accounting year prior to going private
EBITDA/INTEREST	EBITDA divided by interest expense in the accounting year prior to P2P announcement
MTBV	Market value of ordinary shares divided by the net tangible assets at the accounting year end prior to P2P announcement

INTANGIBLES	Average of the ratios of intangible assets over total assets from the 3 accounting years prior to P2P
FIRMSIZE	Book value of total assets in the accounting year prior to going private
ANALYSTS	Number of analysts following target firm in calendar year prior to the announcement of P2P announcement.
ANALDUM	Dummy variable that equals 1 if the number of the analysts is above the sample median for both P2P and control firms and 0 otherwise
BOARDSIZE	Total number of executive and non executive directors of the board in the accounting year prior to P2P announcement
NONEXEC	% of non-executive directors in the accounting year prior to P2P announcement
EXECSHARE	% of total number of issued shares held by executive directors in the accounting year prior to P2P announcement
DUALITY	Dummy variable = 1 when CEO is also COB and 0 otherwise in the accounting year prior to P2P announcement
AUDCOMM	Dummy variable = 1 when firm has audit committee in the accounting year prior to P2P announcement
MBO	Dummy variable = 1 if target firm management is part of bidder and 0 otherwise

Table 3: Descriptive statistics for the going private and control samples

The table reports the t-test (t value) and Wilcoxon ranked sums test (z value) statistics for the equality of group means and medians, respectively. Group medians are also reported. DFTPRBLTY is the default probability. DD is the distance to default. OPTCASH is 3-year average of operating cash flow scaled by 3-year total assets upto the last accounting year before P2P. EV/EBITDA is enterprise value over earning before interest, tax, depreciation and amortization in the accounting year prior to P2P announcement. DEBT/TA is firm's total debt over total assets. EBITDA/INTEREST is EBITDA divided by interest expense. These three variables are from last accounting year prior to P2P event. PE is share price divided by earnings rate per share on 21st day prior to going private announcement. MTBV is market value of ordinary shares divided by net tangible assets on same day. INTANGIBLES is 3-year average of intangible assets divided by 3-year total assets up to the year before company goes private. ANALYSTS is number of analysts following in the P2P year ANALDUM is a dummy that equals 1 if the number of the analysts is above the median number of the analysts of the whole sample including both P2P and control firms. BOARDSIZE is total number of executive and nonexecutive directors of the board. NONEXEC is % of the non-executive directors. EXECSHARE is % of total number of issued shares held by executive directors. DUALITY is coded 1 when CEO is also COB and 0 otherwise. AUDCOMM is coded as 1 when the firm has an audit committee. a, b, and c indicate statistical significance at the 1%, 5%, and 10% level, respectively.

<i>Variable</i>	<i>Going private firm</i>			<i>Control firm</i>			<i>T</i>	<i>Z</i>
	<i>N</i>	<i>Mean</i>	<i>Median</i>	<i>N</i>	<i>Mean</i>	<i>Median</i>		
DFTPRBLTY (bp)	199	259.58	0.10	209	114.73	0.00	1.72 ^c	3.98 ^a
DD	199	4.83	4.27	209	6.11	5.35	-3.69 ^a	-3.98 ^a
OPTCASH	251	0.05	0.07	223	0.05	0.08	-0.04	-1.49
EV/EBITDA	219	5.35	5.25	229	3.18	7.41	0.89	-3.78 ^a
DEBT/TA	222	-0.83	0.12	234	0.03	0.13	0.24	0.78
EBITDA/INTEREST	221	35.92	5.58	208	60.59	7.79	-0.69	-1.76 ^c
PE	232	6.27	8.49	212	12.43	13.55	-2.83 ^a	-5.84 ^a
MTBV	233	1.50	1.07	223	3.83	1.72	-1.46	-5.14 ^a
INTANGIBLES	248	0.07	0.00	223	0.08	0	-0.69	1.34
ANALYSTS	254	3.56	2.00	224	6.92	4	-5.56 ^a	-4.01 ^a
ANALDUM	254	0.45	0.00	224	0.6	1	-3.21 ^a	-3.17 ^a
BOARDSIZE	245	6.60	6.00	224	7.24	7	-3.17 ^a	-3.10 ^a
NONEXEC	245	0.46	0.50	224	0.45	0.43	0.93	1.48
EXECSHARE	245	0.12	0.05	224	0.11	0.03	0.62	1.60
DUALITY	245	0.16	0.00	224	0.17	0	-0.18	0.18
AUDCOMM	245	0.93	1.00	224	0.93	1	0.08	0.08

Table 4: Distribution of Default Probability of the P2P sample.

DFTPRBLTY is the default probability before the announcement of the going private deal. The default probability (DFTPRBLTY), which is expressed in basis points (1 basis point=0.0001), is estimated using model detailed in Appendix A. The default probability ranges correspond to Moody's credit rating categories shown below (See Chan-Lau, J. A., 2006 for a discussion) . However, Moody's KMV model relies on its unique empirical distribution. Since we use normal distribution to arrive at default probability, the segmentation in column 1 of the table is only indicative.

<i>Default Probability Range (bps)</i>	<i>Moody's Rating</i>	<i>Frequency</i>	<i>Percent (%)</i>	<i>Cumulative Frequency</i>	<i>Cumulative Percent (%)</i>
DFTPRBLTY <2	Aaa	124	62.31	124	62.31
2< DFTPRBLTY <=5	Aa	8	4.02	132	66.33
5< DFTPRBLTY <=10	A	9	4.52	141	70.85
10< DFTPRBLTY <=20	Baa	6	3.02	147	73.87
20< DFTPRBLTY <=50	Ba	6	3.02	153	76.88
50< DFTPRBLTY <=200	B	17	8.54	170	85.43
200< DFTPRBLTY <=400	Caa	9	4.52	179	89.95
DFTPRBLTY >400	Ca	20	10.05	199	100.00

Table 5: Logistic regression model of the going private decision

Dependent variable is coded as 1 for going private firms and 0 for control firms. DD is the distance to default (see Appendix A). OPTCASH is 3-year average of operating cash flow to total assets EV/EBITDA is enterprise value over earning before interest, tax, depreciation and amortization in the accounting year prior to P2P announcement. DEBT/TA is total debt over total assets. EBITDA/INTEREST is EBITDA divided by the interest expense. INTANGIBLES is 3-year average of intangible assets divided by total assets up to the accounting year before P2P. ANALDUM is a dummy variable that equals 1 if the number of the analysts is above the median number of the analysts of whole sample. BOARDSIZE is total number of executives and non executive directors. NONEXEC is % of non-executive directors. EXECSHARE is % of total number of issued shares held by executive directors. DUALITY is coded 1 when CEO is also COB and 0 otherwise. AUDCOMM is coded as 1 when the firms have an audit committee or remuneration committee. In Logistic regression, Odds reflect the probability of belonging in one categorize. For example, denoted the probability of having one consecutive acquisition is P , then the Odds of it is : $Odds=P/(1-P)$. In other word, the higher the odds, the higher the probability. Odds ratio reflects the probability of an observation belonging to P2P or nonP2P group. Wald Chi-Square is in parentheses. a, b, and c indicate statistical significance at the 1%, 5%, and 10% level, respectively

<i>Variable</i>	<i>Model 1</i>		<i>Model 2</i>	
	<i>Coefficient</i>	<i>Odds</i>	<i>Coefficient</i>	<i>Odds</i>
Intercept	1.05 (2.20)		1.53 (1.36)	
DD	-0.14 ^a (14.81)	0.93	-0.19 ^a (14.44)	0.83
EV/EBITDA			0.00 (0.03)	1.00
DEBT/TA			-0.93 ^b (3.69)	0.40
EBITDA/INTEREST			0.00 (0.43)	1.00
MTBV			-0.02 (1.18)	0.98
OPTCASH			1.46 (2.11)	4.31
INTANGIBLES			0.59 (0.41)	1.81
ANALYSTS			-0.09 ^a (12.37)	0.91
BOARDSIZE			-0.08 (1.21)	0.93
NONEXEC			0.02 ^b (3.69)	1.02
EXECSHARE			0.04 ^c (3.33)	1.05
EXECSHARE ²			-0.001 ^c (3.57)	1.00
DUALITY			-0.36 (0.81)	0.70
AUDCOMM			-0.50 (0.72)	0.60
Year Dummy	yes		Yes	
Observation	368		320	
Max-rescaled R-Square	0.06		0.25	
Wald Chi-Square	14.81 ^c		46.67 ^a	

Table 6 Cumulative Abnormal Returns

CAR is cumulative abnormal returns estimated using Fama French three factors model. The event windows are (-4, +2 days) and (-10, +10 days) centred on the announcement day, day 0.

<i>Event window (Days)</i>	<i>Observations</i>	<i>Mean (%)</i>	<i>Median (%)</i>	<i>Maximum (%)</i>	<i>Minimum (%)</i>	<i>Std. dev (%)</i>
(-4, +2)	236	15.39	11.21	116.38	-68.53	20.66
(-10, +10)	236	18.37	14.53	138.51	-106.60	25.98

Table 7: Regression of CAR on pre-P2P and bid characteristics

The dependent variable is $100 \times \text{CAR}$. CAR is cumulative abnormal returns estimated using Fama French three factors model. The event windows are (-4, +2) DD is the distance to default estimated based on the market data during the calendar year before the announcement of the going private deal. EV/EBITDA is enterprise value over earning before interest, tax, depreciation and amortization in the accounting year prior to P2P announcement. OPTCASH is 3-year average of operating cash flow to total assets. MTBV is market to book value of equity of the fiscal year end prior to the going private announcement. INTANGIBLES is 3-year average of intangible assets divided by total assets up to the accounting year before P2P. FIRMSIZE is natural logarithm of book value of firm's total assets. ANALDUM is a dummy variable that equals 1 if the number of the analysts is above the median number of the analysts of whole sample. BOARDSIZE is total number of executives and non executive directors. NONEXEC is % of non-executive directors. EXECSHARE is % of total number of issued shares held by executive directors. DUALITY is coded 1 when CEO is also COB and 0 otherwise. AUDCOMM is coded as 1 when the firms have an audit committee. MBO is a dummy equal to 1 if the acquirer includes the incumbent target top management as equity holders. t-statistics for the significance of the coefficients are White's (1980) heteroskedasticity consistent t-statistics. a, b, and c indicate statistical significance at the 1%, 5%, and 10% level, respectively

Variables	Model 1	Model 2
Intercept	15.98 ^a	5.05
DD	-0.29	-0.45
EV/EBITDA		-0.02 ^a
DEBT/TA		-0.84
EBITDA/INTEREST		-0.01 ^b
MTBV		-0.33 ^b
OPTCASH		40.93 ^a
INTANGIBLES		4.25
FIRMSIZE		0.00
ANALSTS		-0.09
BOARDSIZE		-0.38
NONEXEC		0.29 ^c
EXECSHARE		0.27
EXECSHARE ²		0.00
DUALITY		3.23
AUDCOMM		-6.78
MBO		2.45
Year Dummy	yes	yes
Observation	199	179
F-value	1.25	1.99
P value	0.27	0.01
Adj R-Sqr	0.01	0.12

Table 8 Exit mode of the going private firms—Descriptive statistics

The sample comprises of 236 UK going private deals from 1997 to 2005. Within the sample, the exit mode data is available for 217 P2P deals. Further, default probability data is available for 182 targets. Median value is in the parentheses. In Panel A, for the firms that are still held by PE fund, designated as “None”, holding period is defined as the period till the end of December 2005. Exit modes are discussed in Section 4.5 of the text. Distance to default and default probability are defined in Table 2.

Panel A: Holding period (months) classified by exit mode

Exit Mode	Sample size	Mean	Median	Max	Min	Std
Receivership	10	41	44	63	6	18
IPO	11	42	30	84	20	23
Trade Sale	21	45	42	89	7	24
MBO:MBI	23	46	41	97	16	24
None	152	50	52	102	0	26

Panel B: Default probability in bps and distance to default classified by exit mode

Exit Mode	Sample size	Mean Default Probability (Median)	Mean Distance to Default (Median)
Receivership	9	376.00 (72.71)	2.76(2.44)
IPO	9	51.23 (7.36)	4.02 (3.18)
Trade Sale	21	73.54 (0.00)	4.90 (4.97)
MBO:MBI	21	200.89 (0.00)	5.39 (4.92)
None	122	168.10 (0.11)	5.13 (4.24)

Panel C Default probability in bps and distance to default of receivership exit targets

<i>Obs</i>	<i>Company name</i>	<i>P2P Date</i>	<i>Distance- to-default</i>	<i>Default Probability</i>	<i>Deal Value (£M)</i>	<i>Holding period in months</i>
1	UK Safety PLC	20-Mar-98	1.79	365.82	1.01	64
2	Bucknall Group PLC	28-Aug-98	3.21	6.61	14.8	54
3	UPF Group PLC	4-Sep-98	4.48	0.04	42.8	39
4	Crest Packaging PLC	2-Dec-98	2.07	190.29	16.4	53
5	Greycoat	21-May-99	4.08	0.22	282.5	61
6	Lambert Fenchurch	22-Nov-99	1.18	1181.98	130.94	49
7	Finelist/Europe Auto Distn	14-Feb-00	2.44	72.71	159.2	8
8	QS Group plc/Hamsard	26-Sep-02	4.57	0.02	15.8	41
9	Chesterton International	17-Apr-03	1.01	1566.32	10.2	23

Table 9 Exit mode of targets with high default probability (bps) (>400 bps)

<i>Obs</i>	<i>Company name</i>	<i>P2P Date</i>	<i>Distance-to-default</i>	<i>Default Probability</i>	<i>Deal Value(£M)</i>	<i>Exit mode</i>	<i>Holding period in months</i>
1	Parkland Group PLC	24-Nov-98	1.25	1062.26	5.36	None	.
2	Steel Burrill Jones	30-Nov-98	0.71	2389.10	19.20	None	.
3	Saltire PLC	30-Apr-99	0.41	3425.67	25.20	None	.
4	Aspen Group PLC	7-Jun-99	1.62	522.43	14.50	None	.
5	Lambert Fenchurch	22-Nov-99	1.18	1181.98	130.94	Receivership	49
6	PWS Holdings	27-Jun-00	0.73	2316.83	7.20	None	.
7	HI TEC Sports PLC	14-Sep-00	1.71	435.16	7.10	None	.
8	Cedar PLC	7-Jan-02	0.92	1788.58	54.00	None	.
9	Locker Holdings	5-Jun-02	1.00	1581.97	4.00	None	.
10	Send Group	28-Aug-02	1.41	792.94	6.98	None	.
11	Rolfe & Nolan PLC	21-Nov-02	1.63	519.90	15.30	None	.
12	Firth Rixson	6-Dec-02	1.36	872.83	49.70	None	.
13	ReNeuron	1-Apr-03	-3.56	9998.17	3.60	IPO	28
14	Chesterton International	17-Apr-03	1.01	1566.32	10.20	Receivership	23
15	Holmes Place	22-May-03	1.08	1406.48	210.15	Trade Sale	40
16	IDS Group	26-Jun-03	1.04	1502.04	15.40	None	.
17	High-point Rendel	22-Aug-03	1.45	736.59	1.10	None	.
18	Clubhaus	19-Apr-04	0.25	3994.63	56.30	IPO	26

Source: CMBOR

Table 10 Exit mode of the going private firms—Logistic regression

The dependent variable is 1 if exit mode is receivership and 0 for all other outcomes. DD is the distance to default estimated based on the market data during the calendar year before the announcement of the going private deal. EV/EBITDA is enterprise value over earning before interest, tax, depreciation and amortization in the accounting year prior to P2P announcement. OPTCASH is 3-year average of operating cash flow to total assets. MTBV is market to book value of equity of the fiscal year end prior to the going private announcement. LGROWTH is coded 1 if 1 year geometric sales growth rate up to accounting year end before P2P is lower than its median value. INTANGIBLES is 3-year average of intangible assets divided by total assets up to the accounting year before P2P. FIRMSIZE is natural logarithm of book value of firm's total assets. ANALDUM is a dummy variable that equals 1 if the number of the analysts is above the median number of the analysts of whole sample. BOARDSIZE is total number of executives and non executive directors. NONEXEC is % of non-executive directors. EXECSHARE is % of total number of issued shares held by executive directors. DUALITY is coded 1 when CEO is also COB and 0 otherwise. MBO is a dummy equal to 1 if the acquirer includes the incumbent target top management as equity holders. In Logistic regression, Odds reflect the probability of belonging in one categorize. For example, denoted the probability of having one consecutive acquisition is P , then the Odds of it is : $Odds=P/(1-P)$. In other word, the higher the odds, the higher the probability.

<i>Variable</i>	<i>Model 1</i>		<i>Model 2</i>	
	<i>Coefficient</i>	<i>Odds</i>	<i>Coefficient</i>	<i>Odds</i>
Intercept	-1.59 (6.94)		2.08 (0.38)	
DD	-0.37 ^b (4.81)	0.69	-0.96 ^b (6.11)	0.38
EV/EBITDA			0.00 (0.11)	1.00
DEBT/TA			2.46 (0.88)	11.75
EBITDA/INTEREST			0.01 ^b (4.77)	1.01
MTBV			0.06 (0.86)	1.06
OPTCASH			9.98 (1.65)	>999.999
INTANGIBLES			-3.66 (0.26)	0.03
ANALDUM			0.10 (0.01)	1.10
BOARDSIZE			0.29 (1.14)	1.34
NONEXEC			-0.09 ^b (4.45)	0.91
EXECSHARE			-0.11 (1.65)	0.90
EXECSHARE ²			0.00 (1.91)	1.00
DUALITY			1.80 (2.09)	6.04
MBO			-2.96 ^b (5.47)	0.05
Year Dummy			Yes	
Observation	183		181	
Max-rescaled R-Squared	0.1		0.46	
Wald Chi-Square	4.81 ^b		13.85	

a, b, and c indicate statistical significance at the 1%, 5%, and 10% level, respectively