Do private equity investors take firms private for different reasons?*

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Abstract

In recent years, the going private market experienced considerable boom in size and also became more interesting for private equity investors. This paper shows that the pool of going private transactions is heterogeneous. In fact, private equity backed going private transactions are considerably different versus the traditional management sponsored deals without any private equity backing. In our sample of 214 UK going private transactions completed in the period 1997-2003, we show that these two groups of going private firms are heterogeneous in four respects. First, the Jensen's free cash flow hypothesis seems to apply for the management sponsored deals that have more cash at hand. In contrast, private equity backed deals seem to have shortage of cash and pay high dividends. Second, the two types of deals are heterogeneous in ownership structure. The private equity backed deals seem to have higher ownership by financial institutions and their ownership is less concentrated. Third, it is only the management sponsored deals that suffer low visibility as their stock's liquidity and analyst coverage are low. Finally, even though both types of deals suffer market undervaluation, the miss-pricing is larger for the management sponsored deals.

Keywords: Going Private Transactions, Corporate Governance, Private Equity

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1 Introduction

In recent years, the number of firms deciding to go private has increased dramatically around the world. For example, the value of UK firms going private has soared from less than £1 billion in 1996 to £7.2 billion in 2005 (*CMBOR*, 30 March 2006). This makes the UK going private market second only to that in the US. Many companies are considering going private because the reality of being public has fallen far short of the anticipated benefits. With falling market values, structural changes in the trading markets, limited liquidity and volume, many companies simply have been unable to realize the promise of being public and instead are burdened by their public status. (*The Deal*, 24 November 2003).

At the same time, private equity funds have become more involved in the going private market and perform a different role than in the past. In the 1980s, private equity investors often engaged in highly leveraged transactions many of which were seen as hostile by incumbent management. Nowadays, private equity investors are often looking to partner with management. Importantly, they are interested in sound strategic reasons to justify any going private deal. Usually, low valuation on its own is not enough. In fact, private equity investors are after fundamentally strong businesses. Their typical target is a long-term player, has leading market share within their defined niche, and has a strong customer base, good growth potential and good margins (*The Deal*, 24 November 2003). Moreover, the private equity investors are considerably demanding as 80 per cent of going private transactions considered by private equity investors in the UK never reach completion (*Financial Times*, 12 March 2004).

Several empirical papers have examined the reasons for why publicly listed firms decide to go private (see Maupin et al., 1984; Lehn and Poulsen, 1989; Denis, 1992; Opler and Titman, 1993; Halpern et al., 1999 for US evidence and Weir et al., 2004, 2005 for the UK). In this paper, we suggest that the changed environment for going private transactions and especially the new involvement of private equity investors may have led to changed reasons for going private that were not analyzed in the literature yet. We conjecture that the going private deals that have backing of a

private equity house have different characteristics and go private for different reasons than the management buy-outs that do not have the backing of a private equity house. In other words, the population of going private firms is not homogeneous with respect to the reasons for the deal. It can be partitioned into separate groups based on private equity versus sole management involvement in the transaction. We show that these two groups have their own unique characteristics and their own reasons for going private.

Halpern et al. (1999) also contemplate the idea of heterogeneity in going private firms. They argue that "the population of LBOs is heterogeneous and understanding the differences among LBOs is important in understanding both why each type of firm engaged in this transaction and what they did after the transaction" (page 282). We extend this idea of heterogeneity among the going private firms and highlight the involvement of the private equity funds as another key distinction among the going private deals. We consider two separate types of going private transactions: (i) private equity backed going private transactions and (ii) management buyouts where management initiates the deal without any direct involvement of private equity funds (we refer to this group as 'management-sponsored deals'). To cover the whole population of going private deals, our analysis also includes a third type of 'other' going private transactions that are initiated by different parties such as non-executive directors, wealthy private individual investors, industrial firms or financial investors that are not private equity investors. This group is included for completeness of our model. That is, we want to be sure that the found differences between the private equity backed deals and management sponsored deals are not arising due to omitting the remainder of the going private firms.

Another important contribution of this paper is that we test alternative hypotheses that have not been explored in this context so far and test them separately for the two types of going private transactions. We consider four different aspects that may distinguish the two groups of going private firms. First, the heterogeneity in free cash flows hypothesis explores the free cash flow idea of Jensen (1986). Halpern et al. (1999) argue that their heterogeneity hypothesis explains the reasons for go-

ing private transactions better than the Jensen's free cash flow theory. We do not use the two hypotheses as alternatives but rather propose that the free cash flow theory may apply differently across the heterogeneous population of going private transactions. In particular, the private equity backed firms may have less agency problems associated with free cash flows. Second, the heterogeneity in pre-buyout ownership structure hypothesis highlights the ownership structure differences between the two types of firms. We predict that the private equity backed deals have high institutional ownership whereas management sponsored deals have higher managerial ownership. Third, the heterogeneity in visibility hypothesis tests the recently recognized hypothesis that low visibility and market liquidity play an important role in the going private decision (see, for example Boot et al., 2006 and Mehran and Peristiani, 2006). We propose that the private equity backed deals are relatively liquid and have high analyst coverage. It is rather the management sponsored deals that are motivated by low visibility and high illiquidity of their stock. Finally, the heterogeneity in undervaluation hypothesis checks different market valuations of the private equity backed versus management sponsored going private transactions. Because of the private equity investors' interest in strategic justification for their deals, information asymmetry and market undervaluation are expected to be less important for the private equity backed going private deals.

In our empirical analysis, we examine a sample of 214 UK going private transactions that occurred during the period 1997-2003 and compare them to randomly selected UK firms that remained listed on the London Stock Exchange. Using multinomial logistic models, we find support for our conjecture that going private firms are heterogeneous with respect to the private equity involvement in the deal. First, our results suggest that the free cash flow hypothesis applies only for the management sponsored deals. In contrast, private equity backed deals seem to have shortage of cash and pay high dividends. Second, the two types of deals are heterogeneous in ownership structure. The private equity backed deals seem to have higher ownership by financial institutions and their ownership is less concentrated relative to the management sponsored deals. Third, it is only the management sponsored deals that

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suffer low visibility as their stock's liquidity and analyst coverage are low. Finally, even though both types of deals suffer market undervaluation, the miss-pricing is significantly larger for the management sponsored deals.

The plan of the paper is as follows. In Section 2, we derive our four heterogeneity hypotheses. Section 3 describes our sample, methodology and provides basic descriptive statistics of our sample. Section 4 presents our empirical results. Section 5 concludes.

2   Heterogeneity in going private transactions

The main purpose of this paper is testing the conjecture that the population of going private firms is heterogeneous. In particular, we propose that private equity involvement in the going private transactions is associated with different firm characteristics compared to transactions initiated and led by managers. Thus, we argue that in order to get a more detailed picture of the reasons and characteristics of going private transactions, we should not pool all the going private firms together but rather evaluate the reasons for going private in two types of going-private firms: (i) going private transactions backed by private equity investors, and (ii) going private transactions led by the firms' executive directors without any backing of private equity investors (management sponsored deals).

The following subsections explain how private equity backed going private transactions may differ from management led going private transaction without private equity backing.

2.1   Heterogeneity in free cash flows

Most of the empirical evidence concerning going private transactions so far is based on Jensen's free cash flow hypothesis. Jensen (1986) proposes that debt-financed going private transactions may provide a solution to firms in cash-rich, slow growth and declining industries. The main argument maintains that firms with large cash balances but low growth prospects are vulnerable to conflicts of interests between managers and shareholders over payout and investment policies. To mitigate the

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problem, managers can increase dividends and thus provide payout of current cash that would otherwise be invested in low-return projects or wasted. However, a promise of increased dividend is not credible as managers can easily reduce dividends in the future at low cost. In contrast, issuing debt in exchange for stock is a credible strategy to limit free cash flows because unpaid interests lead to bankruptcy.

The empirical studies testing the free cash flow hypothesis in the context of going private transactions provide mixed results. Lehn and Poulsen (1989) document that undistributed cash flow is a significant determinant of a firm's decision to go private. Also Opler and Titman (1993) show that high cash flow firms that also have a low Tobin's q (which they use to measure future growth prospects) are more likely to undertake a LBO. In contrast, Kieschnick (1998) argues that after accounting for choice based sampling, outliers in the data, and potentially misspecified variables, prior growth rate and level of free cash flows are not significant determinants of the odds of going private for the Lehn and Poulsen (1989) dataset. Furthermore, Weir et al. (2004) also fail to document significance of free cash flows in determining the odds of going private for UK firms.

All the empirical papers mentioned above pool all going private firms together and treat them as a single homogeneous group. Halpern et al. (1999), in contrast, distinguish two groups of going private firms according to the level of management ownership before the transaction. However, Halpern et al. (1999) do not test the free cash flow hypothesis on the two groups separately but rather look for other additional explanations behind the two types of deals.[1] We extend the heterogeneity idea of Halpern et al. (1999). In particular, we propose that the free cash flow hypothesis may apply differently for the private equity backed going private firms versus the management sponsored buyouts. Managers of cash-rich firms with low growth prospects may see the potential of leveraged transactions. In particular, they are aware of their ill-specified incentives and can use the excess cash to fund

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[1]In particular, they propose that for the group of low management ownership firms, third-party takeover pressures force management to consider a third party led buyout or face the prospect of hostile takeover. In the case of high prior management ownership group, managers hold large undiversified portfolios and so have an incentive to take cash out of their firm.

the going private transaction or to service new debt and gain control over their firms (Fox and Marcus, 1992). Moreover, the leveraged transaction allows managers to avoid the prospect of hostile takeover and/or shared control with an active private equity investor who typically demands board representation and a say in the firm's long-term strategy (Cotter and Peck, 2001). We therefore predict that large cash balances motivate management sponsored going private transactions.

In contrast, firms with low cash balances and high growth opportunities are more likely to search for private equity backing. At the same time, private equity investors target firms with strong businesses and sound growth potential that are often short of cash (Gompers and Lerner, 2001). Thus, private equity backed deals do not match the profile of Jensen's cash-rich firm.

2.2 Heterogeneity in pre-buyout ownership structure

Halpern et al. (1999) and Elitzur at al. (1998) argue that managers who have a large amount of their personal wealth invested in the company may prefer to diversify their portfolio while keeping or increasing their control over the firm. Managers with large equity stakes therefore have incentives to initiate a leveraged buyout and use new debt to decrease their wealth invested in the firm. It is relatively inexpensive for these managers to acquire a majority of the votes and force the leveraged buyout given their large equity stakes and any potential information asymmetry (Elitzur et al., 1998). Thus, we expect that managers with high ownership stakes in their own firm are more likely to take their firm private and do not seek backing by private equity investors.

Private equity investors typically look for support of a number of incumbent blockholders before they take a firm private. This increases their chances of the deal being successful. In fact, the private equity investor usually contacts the existing blockholders in order to receive irrevocable undertakings wherein the existing blockholders promise to accept the private equity investor's offer (Weir et al., 2006). After receiving the support of several blockholders, the private equity investor makes a public offer for the remaining shares at the same price. These irrevocable undertakings are easier to obtain when ownership is concentrated in the hands of a small

number of outside shareholders. Institutional investors may be of special importance as most of them are passive and not interested in monitoring management closely themselves (Faccio and Lasfer, 2000). They are likely to sell their shares in case they are able to negotiate a premium price and earn a return on their otherwise illiquid investment. Therefore, we expect that high institutional ownership increases the likelihood of a going private transaction backed by *private equity*.

2.3 Heterogeneity in visibility

If a firm's shares are thinly traded, being public may not be worth the cost (Bolton and von Thadden, 1998). Boot et al. (2004) highlight liquidity and low cost of capital as important benefits of public versus private ownership. Furthermore, thinly traded stocks attract lower analyst coverage and are at risk of being neglected by investors when taking their investment decisions (Merton, 1987). Thus, illiquid public firms with low analyst coverage have to bear the high cost of stock exchange listing while not taking enough advantage of the benefits of being a public company (Mehran and Peristiani, 2006). Therefore, we propose that higher illiquidity and a lower number of analysts following the firm may motivate *managers* to take their firm private.

In contrast, private equity investors may not be interested in firms that are illiquid. In fact, Amit et al. (1998) theoretically show that private equity investors prefer projects where monitoring and selection costs are relatively low and where the information asymmetry costs are less severe. At the same time, actively traded stocks that are followed by analysts are usually associated with greater amount of information and expertise available, which in turn reduces the monitoring and selection costs for their investors (Brennan and Hughes, 1991). Thus, we conjecture that *private equity investors* target firms with relatively liquid stocks and high analyst following.

2.4 Heterogeneity in undervaluation

Due to information asymmetry between management and the outside shareholders, it is possible that the market value of a company is over- or undervalued relative to its fundamental value (Merton, 1987). In going private transactions, the perceived

undervaluation may play an important role as it potentially limits management's ability to use the benefits available to public companies as, for example, the accessibility of funds required to finance projects or acquisitions (Allen and Gale, 1999; Pagano et al., 1998). A survey among US managers who underwent a going private transaction indicates that the perceived undervaluation is indeed one of the primary reasons listed by the managers for their firm going private (Maupin et al., 1984). Moreover, undervalued firms are more likely to attract hostile takeover interest (Lehn and Poulsen, 1989) that may lead to managers losing their jobs (Lowenstein, 1985). Therefore, we conjecture that undervaluation of firms increases the likelihood of managers taking their firms private as this allows the managers to keep control over the firm at relatively low cost and avoid (hostile) takeovers.

Outside investors may also value a company more than the current market value because they perceive unused growth opportunities. In particular, a private equity investor may target the firm because of poor management that has not been taking advantage of the firm's growth potential possibly due to a lack of cash (DeAngelo, 1990). Gompers and Lerner (2001) argue that a private equity investor looks for companies that have the potential to evolve in ways that create value and at the same time face problems in raising funds via regular bank debt or public equity. This aspect may be more important in the UK versus the US since the UK venture capital and buyout markets have traditionally been more closely linked (Toms and Wright, 2005). Private equity investors seek to realize a gain on their investment and have shorter investment horizon compared to debt financiers. Short-term growth prospects are therefore expected to be more important. In addition, private equity investors may also follow a 'buy-and-build' strategy in which he/she focuses on growth opportunities within an industry and hires new managers with industry experience as needed. In such a buy-and-build strategy the private equity investor acts as an industry consolidator taking over a number of smaller rival firms. In this case, the value of the going private transaction to the investor depends more on investor's previous portfolio investments rather than the firm being undervalued (Smit and DeMaeseneire, 2005).

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In short, we predict that undervaluation plays a role in both types of going private transactions but to a different degree. Undervaluation is expected to be more important in *management sponsored* private equity transactions. In contrast, undervaluation is less important in transactions *backed by private equity* because these active investors could create additional value using their unique resources such as their network and industry expertise.

3 Data and methodology

3.1 Sample selection

Our original sample consists of 221 non financial firms that have gone private in the United Kingdom during the years 1997-2003. We identify these public-to-private (PtP) transactions from the database of the Centre for Management Buyout Research (CMBOR). For all the PtP firms, we also obtain the offer documents accompanying the going private transaction from Thomson Research. We use these documents to determine whether the deal is backed by private equity investors or not. This is our primary classification criterion and decided on whether a deal falls in the private-equity backed group. In case the transaction is not backed by a private equity house we further examine whether any of the firm's executive directors are involved in the deal. If this is the case, the transaction is coded as a management-sponsored deal. In all other cases, the transaction is classified into the 'other' category. This category includes deals backed by non-executive directors, wealthy families or institutional investors other than private equity houses and is included for completeness of our model.[2]

We do not have data for 7 PtP firms and, therefore, our final sample of going private transactions consists of 214 firms that are relatively evenly distributed between 90 private equity backed deals, 70 deals led by management and not backed by private equity investors and 54 'other' deals led by other parties.

In order to get a more detailed picture of the characteristics of the going private

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[2]Note that the private equity backed deals may be both with and without management involvement. In fact, private equity funds often look for management involvement in their deal.

transactions in general and the two individual types of going private transactions in particular, we contrast the going private firms with firms that remained publicly listed. We opt for a random sample of control firms that remained public: in each of the years of the sample period of 1997-2003 we randomly select 200 control firms from a population of around 1200 firms that continue to be publicly traded in a given year. The sampling procedure allows for a control firm to be included in the sample more than once. In total, we collect data on 1400 control firm-years that cover 960 different control firms. For both the PtP firms and control firms, we get market prices from Datastream, financial statement data from Worldscope, and hand-collect ownership structure and board composition information from Price Waterhouse Coopers' Corporate Register (various issues).

3.2 Descriptive statistics

Table 1 lists our variable definitions whereas Table 2 shows summary statistics for the control firms, all PtP firms and the three types of PtP deals, respectively. All variables are trimmed at the 1st and 99th percentiles, except the ownership and illiquidity variables. We test for differences in means and medians between the control firms and PtP firms and among the three types of PtP firms. We use a t-test for equal means assuming unequal variances and a Mann-Whitney U-test for equal medians. Below we first discuss the differences between the whole sample of PtP firms versus the control firms and then we focus on the differences between the two types of going private firms. Comparing the former with the latter tests highlights the heterogeneity idea proposed in this paper. We only discuss the statistically significant differences for both the mean and the median.

- Please insert Tables 1 and 2 about here -

The going private firms have higher equity stakes held by executive directors and financial institutions than the control firms. As a result, ownership concentration, as measured by the Herfindahl index, is higher in PtP firms than in control firms. Firms that go private are valued less than control firms as indicated by their lower market to book ratios and have more takeover activity. PtP firms' shares are traded

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less actively than the shares of the control firms and are followed on average by less analysts. In addition, firms that go private have less cash and marketable securities, lower sales growth, higher payout ratio and are more profitable than control firms.

Turning to the differences between the different groups of going private firms, we observe that private equity backed deals have significantly lower executive ownership and lower ownership concentration than management sponsored transactions. In contrast, financial institutions own larger equity stakes in the private equity backed deals. Moreover, the private equity backed deals are larger relative to the deals sponsored by management. They also have a higher pay-out ratio and higher analyst following and their shares are more actively traded. Moreover, market to book ratio of the private equity backed deals (that we use as a measure of stock market valuation) is higher indicating that firms that go private with the help of private equity investors are less undervalued than the management sponsored deals. Also, private equity houses appear to target more profitable firms as return on assets of the private equity backed firms is higher.

Finally, we compute the free cash flow proxy of Lehn and Poulsen (1989). We find that private equity backed deals have higher free cash flow in the previous year. Still, it can be argued that this measure reflects the profitability of the company rather than the presence of free cash flows (Arzac, 1992). In fact, the free cash flow measure is highly correlated with the firm's profitability. Therefore, we rather prefer to use the firm's cash and marketable securities as a more suitable proxy for company cash flow that is at the disposal and discretion of managers. We find that private equity backed deals have less cash on their balance sheet then the deals sponsored by management. This suggests that free cash may motivate the management led going private transactions but not the private equity backed deals.

3.3   Model

We employ multinomial logistic regression (MNLR) models to examine the heterogeneity hypotheses developed in the previous section. As mentioned before, we divide our sample of UK firms into four different groups: (1) PE-backed PtP deals, (2) management-led PtPs, (3) other PtPs, and (4) non-PtPs. We denote the observed

group for firm i by the variable y_i, which can take the discrete values $1, 2, \ldots, M$, where $M = 4$ in our case. In the MNLR model the probability that firm i will belong to group m, conditional on the $(k \times 1)$ vector of explanatory variables x_i consisting of a constant and firm characteristics, is given by

$$P[y_i = m|x_i] = \frac{\exp(\beta_m' x_i)}{\sum_{l=1}^{M} \exp(\beta_l' x_i)}, \qquad \text{for } m = 1, \ldots, M. \tag{1}$$

For identification purposes, we set the coefficients for the non-PtP group of firms equal to 0, that is $\beta_4 = 0$.

Estimation of the coefficients in the MNLR model in (1) is straightforward by means of maximum likelihood, except for the following caveat. Our data set is not a random sample from the population of all firms. In particular, while we include all known PtP deals during the period 1997-2003, each year we only sample 200 of the firms that remain listed, which in total equal 1200, on average. This implies that PtP firms are considerably overrepresented in our sample compared to the underlying population of firms. Not accounting for this selective sampling would lead to biased estimates of the intercepts and incorrect standard errors for all estimated coefficients; see Kieschnick (1998) and Fok and Franses (2002) for detailed analysis of selective sampling in the context of binary and ordered logit models, respectively. The problem can be remedied by defining modified probabilities as

$$\tilde{P}[y_i = m|x_i] = \frac{\gamma_m P[y_i = m|x_i]}{\sum_{l=1}^{M} \gamma_l P[y_i = l|x_i]}, \qquad \text{for } m = 1, \ldots, M, \tag{2}$$

where γ_m is the fraction of firms in group m that is included in the sample. Hence, in our case $\gamma_1 = \gamma_2 = \gamma_3 = 1$ while $\gamma_4 = 1/6$. The correct likelihood function, which is used for parameter estimation then makes use of these corrected probabilities.

The effects of the firm characteristics x_i on the probabilities that a firm engages in the different types of PtP deals is a nonlinear function of the model parameters β_m, such that interpretation of these parameters is not straightforward. For interpretation of the model, it is useful to consider the log-odds ratio of group m versus group l, defined as

$$\log\left(\frac{P[y_i = m|x_i]}{P[y_i = l|x_i]}\right) = x_i'(\beta_m - \beta_l). \tag{3}$$

This shows that firms with a larger value for $x_{i,j}$ more likely belongs to group m than to group l if $(\beta_{m,j} - \beta_{l,j}) > 0$, where $x_{i,j}$ indicates the j-th element of x_i, and $\beta_{m,j}$ and $\beta_{l,j}$ are the corresponding coefficients. Note that this does not necessarily imply that the probability that firm i belongs to group m increases with $x_{i,j}$, as the the odds ratios of group m versus the other categories also change. The net marginal effect of a change in $x_{i,j}$ on the group probability follows from the partial derivative of is given $P[y_i = m | x_i]$ with respect to $x_{i,j}$, which is given by

$$\frac{\partial P[y_i = m | x_i]}{\partial x_{i,j}} = P[y_i = m | x_i] \left(\beta_{m,j} - \sum_{l=1}^{M} \beta_{l,j} P[y_i = l | x_i] \right). \tag{4}$$

The sign of this derivative depends on the sign of the term between brackets, which may be positive or negative depending on the value of x_i. Hence, the sign of the marginal effect of $x_{i,j}$ on $P[y_i = m | x_i]$ will not always correspond with the sign of the coefficient $\beta_{m,j}$. Also note that the marginal effect depends on the values of the other explanatory variables in x_i, denoted as $x_{i,-j}$. In order to obtain a clear view on the effect of the variable of interest $x_{i,j}$ one should therefore consider $\frac{\partial P[y_i = m | x_{i,j}]}{\partial x_{i,j}} = \int_{x_{i,-j}} \frac{\partial P[y_i = m | x_i]}{\partial x_i} dx_{i,-j}$, integrating out the effects of these other explanatory variables. In practice this can be done by averaging (4) across all realizations of $x_{i,-j}$ in the sample for each value of $x_{i,j}$. In the empirical analysis presented in the next section we follow a more direct approach by considering the group probabilities $P[y_i = m | x_{i,j}]$ themselves to gauge the effects of the different firm characteristics on the probabilities of the different types of PtP deals. We do average out the effects of other explanatory variables by computing $P[y_i = m | x_{i,j}] = \frac{1}{N} \sum_{n=1}^{N} P[y_n = m | x_{i,j}, x_{n,-j}]$, where N is the sample size.

An important assumption underlying the MNLR model in (1) is independence of irrelevant alternatives, meaning to say that the odds ratio of, for example, PE-backed and management-led PtP deals does not depend on the inclusion of the third group of PtP transactions, which can also be seen from (3). We examine the validity of this assumption by means of the specification test developed by Hausman and McFadden (1984).

Our heterogeneity hypothesis of PE-backed and management-led PtP transactions implies that certain firm characteristics such as free cash flow and management

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ownership affect the relative probabilities of a firm belonging to the different groups. Put differently, in the MNLR model the coefficients $\beta_{m,j}$ should differ across groups m. For an individual variable, $x_{i,j}$ say, the null hypothesis of no heterogeneity across groups m and l can easily be tested by means of a likelihood ratio test of the restriction $\beta_{m,j} = \beta_{l,j}$. The same holds for a given sub-set of the explanatory variables included in the model. Testing whether there is no heterogeneity at all is slightly more involved, and effectively boils down to testing whether two groups can be combined into one. This is done by means of the likelihood ratio test developed by Cramer and Ridder (1991). Finally, we should remark that the above likelihood ratio test statistics also enable us to assess in which respects the third group of PtP transactions is similar to the PE-backed and management-led ones.

4 Results

The main contribution of this paper is to show that the population of going private firms is heterogeneous and that the reasons for the transaction are different across the two main types of firms. To examine this hypothesis, we estimate multinomial logistic regressions with private equity backed, management sponsored and other going private deals analyzed against the control firms that remained public.

Table 3 reports the results. Our model treats the non-PtP control firms as the omitted category. Hence, Table 3 reports coefficients for private equity backed, management sponsored and other deals separately in subsequent columns. These coefficients show how the explanatory variables affect the probability of going private through the particular type of transaction relative to the non-PtP firms. The last three columns in Table 3 show the p-values for a likelihood ratio test of equal parameters among the three types of PtP deals and thus show significance of pairwise differences among the going private types. We are particularly interested in the differences between the private equity backed and management sponsored deals. The last two lines show p-values for the likelihood ratio test of Cramer and Ridder (1991) that all parameters except the intercept are equal for the corresponding two groups and the independence of irrelevant alternatives test, respectively.

Overall, the results suggest that the going private transactions are indeed heterogeneous. The no heterogeneity test of Cramer and Ridder (1991) suggests that all the three going private groups have different deal characteristics from the non-PtP firms as well as from each other. Moreover, the independence of irrelevant alternatives test reported in the last row indicates that the choice of the type of the going private deal (whether the deal is indeed supported by a private equity house or is fully led by the management or is sponsored through another party) is fully independent. This implies that the decision to go private is made at the same time as the decision about the type of the deal. In other words, the firm does not decide about going private first and then looks for possible methods how to realize it. The independence of irrelevant alternatives test also shows that the multinomial logistic regression is the preferred estimation method and that this method fits the setting of going private decision better than the nested logit model.

Our first hypothesis on heterogeneity in free cash flows conjectures that more cash rich firms are more probable to go private via a management sponsored deal whereas low cash levels increase the probability of a private equity backed deal. We include variables measuring cash levels, growth prospects, dividend policy, and taxes. The coefficients for our cash variable support the hypothesis. The results show that relatively to the non-PtP control firms the private equity backed deals have significantly lower cash levels (at the one percent level) and the management sponsored deals have significantly higher cash levels (at the ten percent level). Moreover, these two coefficients are statistically different from each other at the one percent level showing that the management sponsored deals are more cash-rich than the private equity backed deals. The sales growth variable is not significant implying that (past) growth opportunities do not affect the probability of going private.

We include also payout ratio as an explanatory variable as firm dividend policy is closely related to the free cash flow hypothesis and can provide additional support for our hypothesis. Indeed, the payout coefficient for the private equity backed deals is positive and significant at the ten percent level. Thus, the private equity backed

deals pay relatively higher dividends compared to the non-PtP firms. Given they are at the same time also short of cash, they do not seem to suffer from the problems of excess free cash flows suggested by the Jensen's hypothesis. Taxes seem to be positively affecting the odds of going private for the management sponsored deals. Taxes are, however, not essential for Jensen's argument and go along with any deal that is financed by issuing new debt.

Figures 1a to 1d provide additional intuition for the results. The lines in the graphs show how the probability that a firm belongs to a particular type of going private transactions depends on the cash levels, sales growth, payout ratio, and tax, respectively. It is important to note that the variables on the x axis are measured as deviation from the year and industry specific medians and the effect of the remaining explanatory variable from the regression are averaged out. Figure 1a shows that as the cash levels increase, the probability of a private equity backed deal decreases whereas the probability of a management sponsored deal increases. At the same time payout ratio has more dramatic effect on the probability of a private equity backed deal relatively to a management sponsored deal. This provides support for the heterogeneity in free cash flows hypothesis. We show that the management sponsored deals are more probable to have higher cash levels and suffer the problems associated with free cash flows. This may motivate them to go private via a leveraged buyout. In contrast, private equity backed firms are more likely to be short of cash and at the same time pay high dividends. Therefore, excess cash does not seem to be one of the reasons for going private for the private equity backed firms.

Our second hypothesis highlights the heterogeneity in ownership and proposes that high executive ownership may increase chances of a management sponsored deal whereas high ownership by financial institutions increases chances of private equity backed deals. The coefficient for executive ownership in the management sponsored deals is indeed positive and significant at the one percent level indicating that high executive ownership indeed increases the probability of management sponsored transaction relative to the firm staying public. However, executive ownership also increases chances of a private equity backed deal. The corresponding coefficient

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is positive and significant at the five percent level. This supports the view that private equity investors look for support of management in their deals and chose firms with relatively high managerial ownership. The difference between the coefficients for the two types of deals is not significant documenting no heterogeneity in this variable.

In contrast, there are significant differences with respect to ownership by financial institutions. High ownership by financial institutions increases the probability of a private equity deal (significant at the one percent level) relative to both non-PtP firms as well as management sponsored deals. Moreover, ownership concentration (measured by the Herfindahl index) seems to matter as well. In particular, ownership concentration is lower for the private equity backed deals and higher for the management sponsored transactions (results not reported). The results are also confirmed in Figures 1e and 1d. In fact, the probability of management sponsored and as well as private equity backed deals increase with executive ownership. However, only probability of private equity backed deals increases with ownership by financial institutions.

In short, our heterogeneity in ownership hypothesis is partially supported. Our results suggest that it is easier for the management of a firm to force a leveraged deal through when they the management has higher control and concentration of ownership. At the same time, however, private equity investors are also interested in firms with high managerial ownership. Therefore, the heterogeneity in pre-transaction ownership structure stems mainly from the differences in ownership by financial institutions. Willingness of this ownership type to accept a deal may increase the success of the transaction and motivate private equity investors to proceed with it at the first place.

Our heterogeneity in visibility hypothesis conjectures that high illiquidity and low analyst coverage may increase chances of a management sponsored deal whereas they do not determine odds of a private equity backed deal. In fact, the coefficient for illiquidity in Table 3 is positive and significant at the one percent level for the management sponsored deals whereas it is not significant for the private equity backed

deals. Moreover, the two coefficients are significantly different at the one percent level. Analyst following has similar effect. Small number of analysts following the firm increases the probability of a management sponsored deal relative to both the non-PtP control firms as well as the private equity backed deals (both at the ten percent level).

Firm size may be another measure indicating visibility of a firm. Size (log of total book value of assets) in Table 3, however does not support low visibility of management sponsored deals. In fact, its coefficient for the management sponsored deals is positive and significant indicating that management sponsored deals are larger. Inspecting the correlation matrix, however, shows that this effect is due to high correlation between illiquidity and size. Thus, the coefficients for size are strongly affected by inclusion of the illiquidity variable. As both variables are important and their correlation does not affect other coefficients, we opt to include both total assets and illiquidity in our model. However, the coefficients for size should be interpreted with caution as excluding the illiquidity variable results in the size variable being negative and significant (at the one percent level) for the management sponsored deals and not significant for the private equity backed deals.

Figures 2a and 2b show clearly that probability of management sponsored deals is strongly affected by high illiquidity and low analyst coverage. In contrast, this is not the case at all for the private equity backed firms. Thus, our results support the hypothesis that the going private firms are heterogeneous with respect to visibility. Management sponsored deals seem to suffer both low liquidity and low analyst coverage and therefore have less reasons to remain publicly listed.

Our last hypothesis proposes that both management sponsored and private equity backed deals are relatively undervalued. This implies that they are cheaper to buy. At the same time, it implies that the firms cannot take full advantage of their public listing because of the miss-valuation (e.g. they cannot raise fairly priced equity). But we have to keep in mind that the private equity investors look also for other sources of value creation in their targets and their targets are typically sound businesses. Therefore, we propose that private equity backed transactions are less undervalued

relative to management sponsored deals.

Our results in Table 3 confirm this hypothesis. The coefficient for the market to book ratio is negative for both types of PtP deals showing that both PtP types are on average undervalued relative to the firms that remain public. At the same time they both experience higher takeover activity as indicated by the rumour variable. However, the management sponsored deals are more undervalued relative to the private equity backed deals (the difference is significant at the five percent level). Figure 2c also shows that probability of a management sponsored deal sharply increases as market to book falls whereas this is not the case for the private equity backed deals. In short, our results suggest that market undervaluation plays an important role for the decision to go private for both the management sponsored and private equity backed going private transactions. However, the explanatory power of undervaluation is a lot larger for the management sponsored deals.

In addition to size, our model includes three additional control variables: total debt, return on assets and standard deviation of returns. These three variables do not seem to have effect on the odds of going private as only one coefficient, the one for standard deviation of returns for private equity backed firms, is significant. However, Figures 3b to 3d indicate that the probability of a private equity backed deal is also sensitive to low debt levels and high profitability. Thus, less indebted and more profitable firms are more likely to go private with the support of a private equity investor.

5   Concluding remarks

This paper proposes that the recent increase of private equity investors' involvement in going private transactions may affect the characteristics of the firms that decide to go private. In particular, we show that the (main) source of value creation in a going private transaction depends on the fact whether the deal is backed by private equity investment or is purely managed by insiders of the firm. Drawing upon several theoretical arguments (including the Jensen's free cash flow hypothesis, ownership structure, and the framework of costs and benefits of being publicly listed versus

privately owned commonly applied in the IPO literature) we derive four testable hypotheses concerning the heterogeneity of going private transactions with respect to (i) free cash flows, (ii) pre-transaction ownership structure, (iii) visibility, and (iv) undervaluation.

In summary, our empirical results provide convincing evidence that the population of going private firms is in fact heterogeneous. We show that private equity backed and management sponsored deals have different reasons for their decision to exit the stock market. The management sponsored deals have relatively high cash levels, high executive ownership, are illiquid, not followed by analysts and are significantly undervalued. Moreover, these firms pay high taxes. The private equity backed deals, in contrast, have high executive ownership, high ownership by financial institutions but have lower ownership concentration. These firms have shortage of cash, low debt levels, and pay high dividends. Thus, our results suggest that the management sponsored deals fit the characteristics of the Jensen's cash rich firms with strong management that, moreover, are relatively small, illiquid in the stock market, not followed by analysts and are significantly undervalued. This suggests that the benefits of remaining publicly listed fall short of the costs and the decision to go private is inevitable. In contrast, benefits of stock market listing seem to be larger for the private equity backed deals as they are more liquid, followed by analysts and not so much undervalued. However, they seem to be short of cash. Private equity backing may provide the needed financing and extra know-how for restructuring.

References

Allen, F., and D. Gale, 1999, "Diversity of Opinion and Financing of New Technologies," *Journal of Financial Intermediation*, 8, 68–89.

Amit, R., J. Brander, and C. Zott, 1998, "Why Do Venture Capital Firms Exist? Theory and Canadian Evidence," *Journal of Business Venturing*, 13, 441–446.

Bolton, P., and E.-L. von Thadden, 1998, "Blocks, Liquidity, and Corporate Control," *Journal of Finance*, 53, 1–25.

Boot, A.W.A., R. Gopalan, and A.V. Thakor, 2004, "Go Public or Stay Private: A Theory of Entrepreneurial Choice," CEPR Discussion Paper No. 4219.

Boot, A.W.A., R. Gopalan and A.V. Thakor, 2006, "Market Liquidity, Investor Participation and Managerial Autonomy: Why Do Firms Go Private?," CEPR Discussion Paper No. 5510.

Brennan, M., and P. Hughes, 1991, "Stock Prices and the Supply of Information," *Journal of Finance*, 46, 1665–1691.

Cotter, J. and S. Peck, 2001, "The Structure of Debt and Active Equity Investors: The Case of the Buyout," *Journal of Financial Economics*, 59, 101–147.

Cramer, J.S. and G. Ridder, 1991, "Pooling States in the Multinomial Logit Model," *Journal of Econometrics*, 47, 267–272.

DeAngelo, L., 1990, "Equity Valuation and Corporate Control," *Accounting Review*, 93–112.

Denis, D.J., 1992, "Corporate Investment Decisions and Corporate Control: Evidence from Going-Private Transactions," *Financial Management*, 80–94.

Elitzur, R., P. Halpern, R. Kieschnick, and W. Rotenberg, 1998, "Managerial Incentives and the Structure of Management Buyouts," *Journal of Economic Behavior and Organization*, 36, 347–367.

Faccio, M. and M.A. Lasfer, 2000, "Do Occupational Pension Funds Monitor Companies in which They Hold Large Stakes?", *Journal of Corporate Finance*, 6, 71–110.

Fok, D., and P.H. Franses, 2002, "Ordered Logit Analysis for Selectively Sampled Data," *Computational Statistics and Data Analysis*, 40, 477–497.

Fox, I. and A. Marcus, 1992, "The Causes and Consequences of Leveraged Management Buyouts," *Academy of Management Review*, 17, 62–85.

Gompers, P., and J. Lerner, 2001, *The Money of Invention: How Venture Capital Creates New Wealth*, Harvard Business School Press, Boston, MA.

Halpern, P., R. Kieschnick, and W. Rotenberg, 1999, "On the Heterogeneity of Leveraged Going Private Transactions," *Review of Financial Studies*, 12, 281–309.

Hausman, J. and D. McFadden, 1984, "Specification Tests for the Multinomial Logit Model," *Econometrica*, 52, 1219–1240.

Jensen, M., 1986, "Agency Costs of Free Cash Flows, Corporate Finance and Takeovers," *American Economic Review*, 76, 323–329.

Kieschnick, R., 1998, "Free Cash Flow and Stockholder Gains in Going Private Transactions Revisited," *Journal of Business Finance and Accounting*, 25, 187–202.

Lehn, K., and A. Poulsen, 1989, "Free cash Flow and Stockholder Gains in Going Private Transactions," *Journal of Finance*, 44, 771–787.

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

Maupin, R.J., C.H. Bidwell, and A.K. Ortegren, 1984, "An Empirical Investigation of the Characteristics of Publicly-Quoted Corporations Which Change to Closely-Held Ownership Through Management Buyouts," *Journal of Business Finance and Accounting*, 11, 435–450.

Mehran, H. and S. Peristiani, 2006, "Financial Visibility and the Decision to Go Private," Working paper, Federal Reserve Bank of New York.

Merton, R.C., 1987, "A Simple Model of Capital Market Equilibrium with Incomplete Information," *Journal of Finance*, 42, 483–510.

Opler, T., and S. Titman, 1993, "The Determinants of Leveraged Buyout Activity: Free Cash Flow vs. Financial Distress Costs," *Journal of Finance* 48, 1985–1999.

Pagano, M., F. Panetta, and L. Zingales, 1998, "Why Do Companies Go Public? An Empirical Analysis," *Journal of Finance*, 53, 27–64.

Smit, H.T.J. and W. DeMaeseniere, 2005, "The Role of Investor Capabilities in Public-to-Private Transactions," Working paper, Erasmus University Rotterdam.

Toms, S. and M. Wright, 2005, "Divergence and Convergence within Anglo-American Corporate Governance Systems: Evidence from Divestment in the US and UK 1950-2000," *Business History*, 47, 267–295.

Weir, C., D. Laing, M. Wright, 2005, "Incentive Effects, Monitoring Mechanisms and the Market for Corporate Control: An Analysis of Factors Affecting Public to Private Transactions in the UK," *Journal of Business Finance and Accounting*, forthcoming.

Weir, C., D. Laing, M. Wright, and A. Burrows, 2004, "Financial Distress Costs, Incentive Realignment, Private Equity and the Decision to Go Private: Public to Private Activity in the UK," working paper, Aberdeen Business School.

Weir, C., Laing, D., Wright, M. and A. Burrows, 2006, "Irrevocable Commitments and Going Private", *European Financial Management*, forthcoming.

Table 1: Variable Definitions

Total assets	total assets (in millions)	Worldscope
Total debt	total debt divided by total assets	Worldscope
ROA	net income divided by total assets	Worldscope
St. dev. of stock returns	standard deviation of stock returns over the period from January to December of the calendar year before PtP transaction	Datastream
Cash	cash and marketable securities divided by total assets	Worldscope
Free cash flows	(ebitda - taxes - interest - cash dividend - stock repurchases) divided by sales	Worldscope
Sales growth	sales growth during 3 financial years before PtP transaction average	Worldscope
Investment	capital expenditures divided by sales	Worldscope
Tax	income taxes divided by sales	Worldscope
Payout ratio	cash dividend divided by the sum of net income and depreciation	Worldscope
Ownership of		
executives	percentage of shares held by executive directors of the company	Corporate Register
non-executives	percentage of shares held by non-executive directors of the company	Corporate Register
financial inst.	percentage of shares held by financial institutions (e.g. pension funds, mutual funds, insurance companies, banks, venture capitalists)	Corporate Register
other firms	percentage of shares held by industrial firms	Corporate Register
individuals	percentage of shares held by persons that are not directors of the company	Corporate Register
Herfindahl index	sum of squared equity stakes held by the executives as a group, non-executive directors as a group, financial institutions as a group, other firms as a group and individuals as a group	Corporate Register
Illiquidity	fraction of days with zero percent return during January to December of the calendar year before PtP transaction	Datastream
Analyst following	Number of analysts following the company in December of the calender year before PtP transaction	IBES
Market to book	market capitalization plus total debt divided by total assets	Worldscope
Rumours	Number of takeover rumours during two calendar years before PtP transaction	Lexis Nexis and SDC M&A

Table 2: Comparison of types of firms

| | Means | | | | | t-test p-values | | | |
Variable	non-PtP	PtP	PE	MS	Oth.	non-PtP PtP	PE MS	PE Oth.	MS Oth.
Panel 1									
Total assets	692.4	202.8	223.3	100.8	300.8	0.000	0.008	0.211	0.013
Total debt	0.199	0.206	0.190	0.213	0.223	0.303	0.210	0.157	0.396
ROA	−0.019	0.002	0.031	−0.019	−0.020	0.103	0.087	0.055	0.490
St.dev. of return	15.38	15.34	15.50	15.46	14.90	0.443	0.479	0.203	0.246
Cash	0.132	0.114	0.085	0.140	0.130	0.069	0.017	0.051	0.389
Free cash flows	−0.084	−0.036	0.033	−0.130	−0.029	0.117	0.054	0.119	0.179
Sales growth	0.154	0.109	0.129	0.126	0.053	0.021	0.475	0.046	0.093
Investment	0.063	0.079	0.026	0.095	0.149	0.225	0.046	0.028	0.225
Payout ratio	0.188	0.195	0.286	0.190	0.045	0.417	0.060	0.005	0.066
Tax	0.020	0.022	0.022	0.019	0.026	0.214	0.293	0.235	0.144
Ownership of									
executives	0.088	0.121	0.098	0.198	0.060	0.006	0.001	0.080	0.000
non-executives	0.032	0.029	0.026	0.039	0.020	0.215	0.122	0.241	0.044
financial inst.	0.187	0.243	0.302	0.170	0.237	0.000	0.000	0.039	0.030
other firms	0.030	0.034	0.020	0.024	0.072	0.287	0.345	0.004	0.008
individuals	0.124	0.139	0.072	0.165	0.218	0.141	0.000	0.000	0.094
Herfindahl index	0.076	0.106	0.078	0.114	0.143	0.000	0.008	0.004	0.132
Illiquidity	0.530	0.633	0.566	0.733	0.618	0.000	0.000	0.074	0.001
Analysts	3.028	2.651	3.122	1.913	2.811	0.011	0.000	0.215	0.012
Market to book	1.528	0.879	1.050	0.702	0.818	0.000	0.000	0.010	0.052
Rumours	0.322	0.642	0.778	0.493	0.604	0.000	0.041	0.151	0.227
Number of obs.	1400	212	90	69	53				

	Medians					U-test p-values			
Variable	non-PtP	PtP	PE	MS	Oth.	non-PtP PtP	PE MS	PE Oth.	MS Oth.
Panel 2									
Total assets	67.01	65.18	66.50	51.05	125.3	0.488	0.015	0.123	0.001
Total debt	0.173	0.177	0.172	0.170	0.187	0.493	0.399	0.293	0.385
ROA	0.044	0.038	0.057	0.038	0.020	0.349	0.002	0.000	0.054
St.dev. of return	14.54	14.42	14.62	14.64	13.90	0.369	0.288	0.084	0.255
Cash	0.070	0.050	0.045	0.076	0.039	0.030	0.060	0.407	0.164
Free cash flows	0.048	0.041	0.050	0.029	0.046	0.082	0.045	0.242	0.248
Sales growth	0.071	0.048	0.052	0.028	0.041	0.013	0.238	0.049	0.155
Investment	0.027	0.025	0.024	0.022	0.030	0.215	0.241	0.141	0.401
Payout ratio	0.180	0.207	0.235	0.208	0.167	0.091	0.083	0.018	0.193
Tax	0.015	0.013	0.018	0.013	0.008	0.236	0.151	0.218	0.478
Ownership of									
executives	0.015	0.027	0.020	0.122	0.009	0.001	0.000	0.002	0.000
non-executives	0.002	0.001	0.001	0.004	0.002	0.491	0.085	0.406	0.105
financial inst.	0.151	0.221	0.306	0.112	0.189	0.000	0.000	0.024	0.054
other firms	0.000	0.000	0.000	0.000	0.000	0.423	0.304	0.006	0.023
individuals	0.055	0.064	0.031	0.111	0.110	0.227	0.000	0.001	0.349
Herfindahl index	0.047	0.065	0.050	0.092	0.088	0.000	0.000	0.001	0.493
Illiquidity	0.571	0.663	0.598	0.750	0.663	0.000	0.000	0.013	0.002
Analysts	2.000	2.000	3.000	1.000	2.000	0.036	0.000	0.146	0.005
Market to book	1.013	0.764	0.830	0.670	0.769	0.000	0.000	0.040	0.058
Rumours	0.000	0.000	0.000	0.000	0.000	0.000	0.107	0.430	0.160
Number of obs.	1400	212	90	69	53				

Note: This table shows the means and medians across non-PtP, PtP firms as well as private equity backed (PE), management sponsored (MS) and other (Oth.) deals. The last four columns show *p*-values for a *t*-test for equal means allowing for unequal variances in Panel 1 and a Mann-Whitney U-test for equal medians in Panel 2. All variables are trimmed at the 1st and 99th percentiles, except for the ownership and illiquidity variables. See Table 1 for variable definitions.

Table 3: Multinomial Logistic Regression Analysis of Factors Influencing the Likelihood of Going Private Transactions

Variable	Private equity backed deals		Management sponsored deals		Other deals		p-value for LR test of equal parameters		
	coeff.	s.e.	coeff.	s.e.	coeff.	s.e.	PE-MS	PE-Oth	MS-Oth
Cash	−2.324	(1.150)**	1.589	(0.854)*	1.445	(0.958)	0.004	0.009	0.906
Sales growth	0.010	(0.360)	0.282	(0.368)	−1.085	(0.695)	0.586	0.128	0.054
Payout ratio	0.565	(0.293)*	0.172	(0.340)	−0.585	(0.256)**	0.372	0.003	0.058
Tax	5.668	(4.600)	12.060	(5.030)**	15.715	(4.743)***	0.330	0.114	0.573
Executive ownership	2.044	(0.805)**	2.676	(0.692)***	−1.608	(1.393)	0.528	0.013	0.001
Financial inst. own.	3.247	(0.618)***	−0.170	(0.812)	0.094	(0.830)	0.000	0.001	0.814
Illiquidity	0.268	(0.800)	4.713	(0.951)***	3.075	(1.000)***	0.000	0.026	0.213
Analysts following	0.009	(0.050)	−0.134	(0.070)*	0.027	(0.062)	0.079	0.814	0.071
Market to book	−0.293	(0.170)*	−0.887	(0.243)***	−0.512	(0.233)**	0.038	0.431	0.251
Rumours	0.414	(0.099)***	0.440	(0.138)***	0.321	(0.135)**	0.865	0.537	0.513
Size	−0.017	(0.122)	0.301	(0.140)**	0.278	(0.146)*	0.078	0.114	0.908
Total debt	−1.034	(0.825)	0.718	(0.796)	1.400	(0.868)	0.113	0.038	0.543
ROA	1.530	(1.046)	0.419	(0.779)	−0.216	(0.806)	0.375	0.176	0.564
St.dev. of returns	0.079	(0.033)**	0.045	(0.034)	−0.012	(0.041)	0.463	0.074	0.260
No heterogeneity test	0.000		0.000		0.000		0.000	0.000	0.000
IIA test	1.000		1.000		1.000				

Note: The table reports estimation results for the multinomial logistic regression model given in (1), using the non-PtP firms as reference group. The model is estimated using 212 observations for UK PtP deals over the period 1997-2003. The numbers of observations in the PtP groups are 90 for PE-backed deals, 69 for MS-deals, and 53 for other deals. The non-PtP group consists of 1200 observations. Standard errors are given in parentheses, with ***, **, and * indicating significance at the 1%, 5% and 10% level, respectively. The final three columns show p-values for the LR test of equal parameters across two sub-groups of PtP deals. The line "No heterogeneity test" reports p-values for the LR test of Cramer and Ridder (1991) that all parameters except the intercepts are equal for two groups. The first three numbers in this line compare the non-PtP group with one of the PtP groups. The line "IIA test" reports p-values for the Hausman and McFadden (1984) LR test for the validity of the independence of irrelevant alternatives (IIA) assumption, omitting the indicated group from the model. Variable definitions are provided in Table 1.
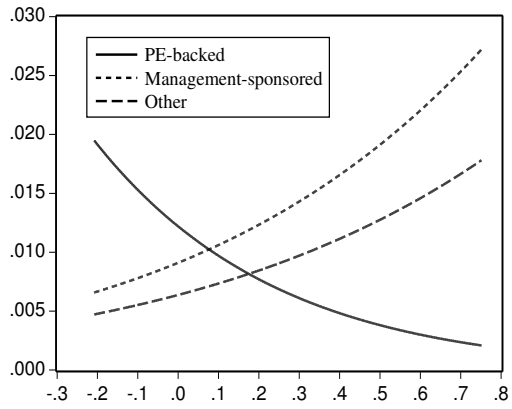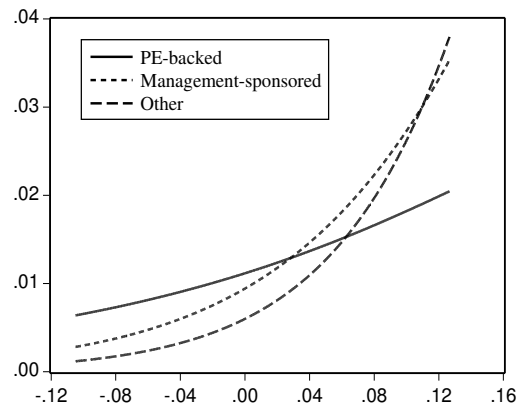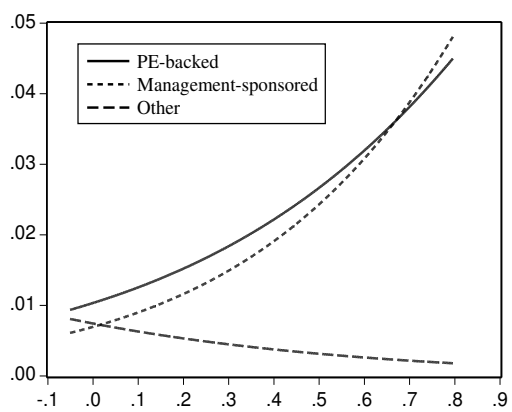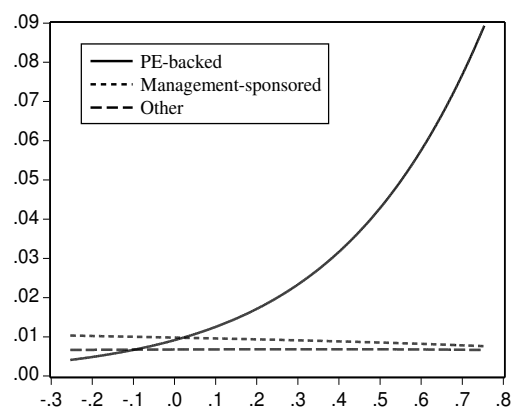
(a) Cash
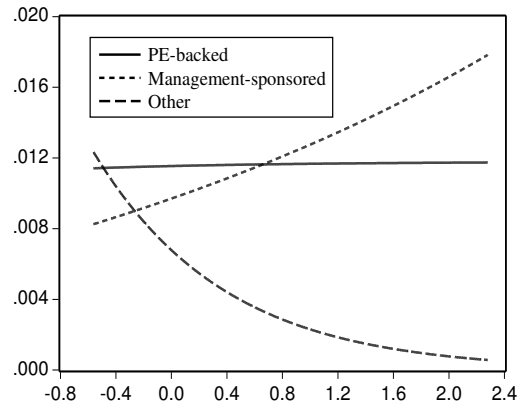
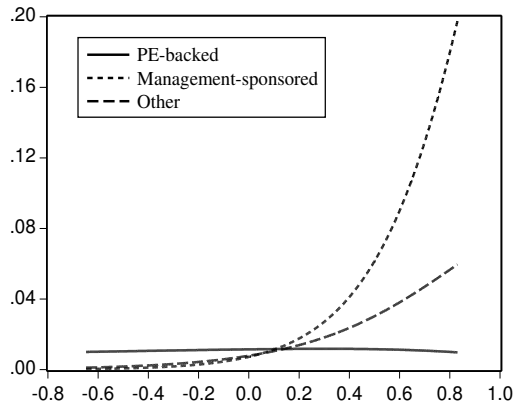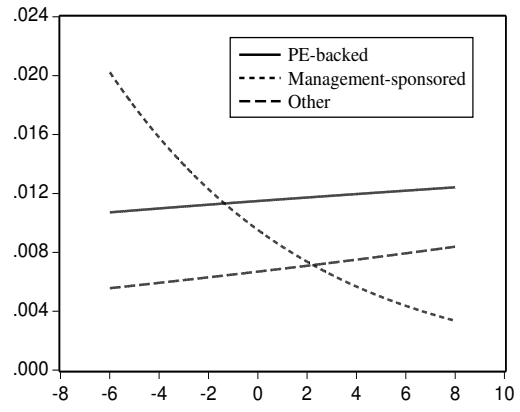(b) Sales growth
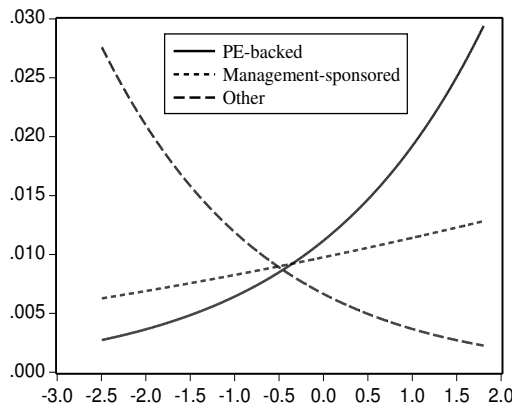
(c) Payout ratio

(d) Tax

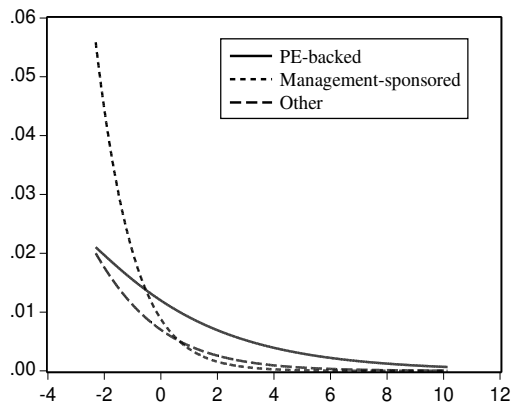(e) Exec.own

(f) Fin.inst.own
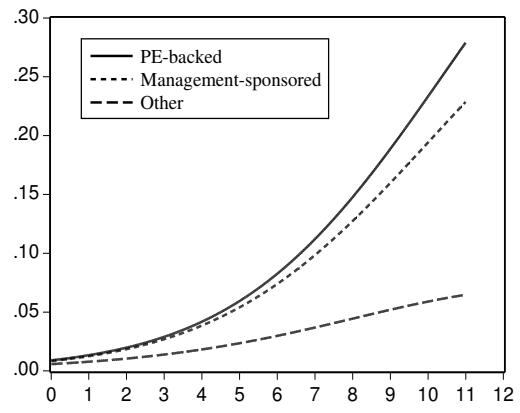
Figure 1: Multinomial Logit probabilities

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(a) Illiquidity
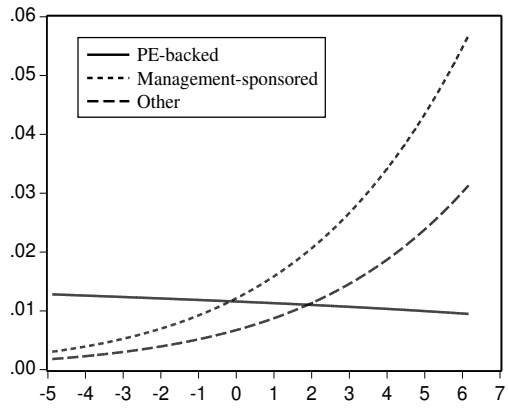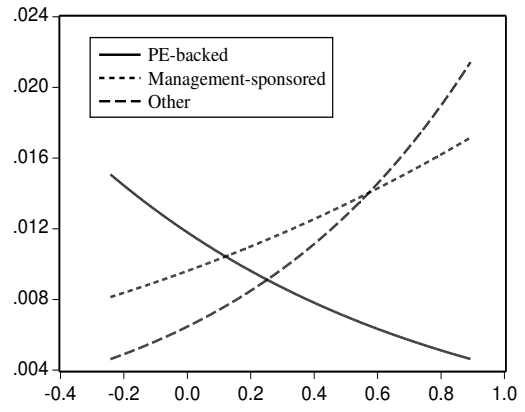
(b) Analysts following

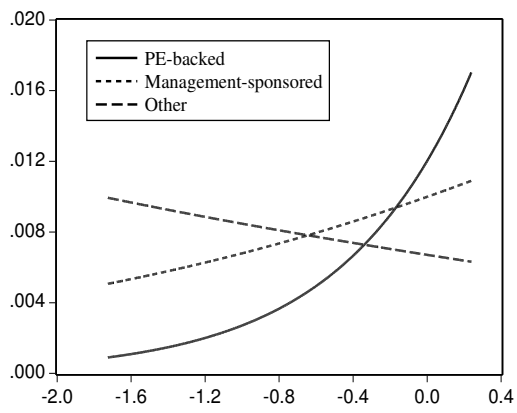(c) Market to book

(d) Rumours
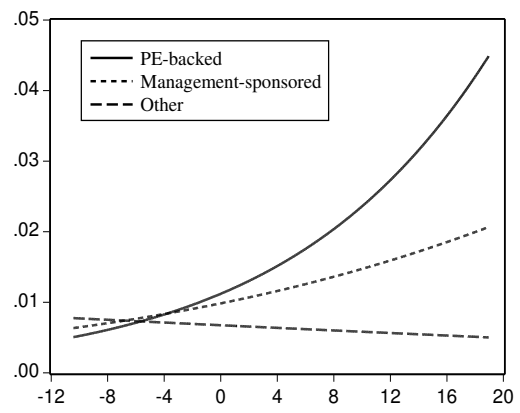
Figure 2: Multinomial Logit probabilities

(a) Size

(b) Total debt

(c) ROA

(d) St.dev. of returns

Figure 3: Multinomial Logit probabilities