



**The Operating Performance of Buyout IPOs in the UK
and the Influence of Private Equity Financing**

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Abstract

This paper evaluates the operating performance of buyout firms that exit through IPOs using a sample of 178 UK companies over the period 1980-1998. In particular, we consider the operating performance of buyout firms measured by cash flow to total assets, asset turnover and cash flow to sales, from three years before IPO to five years following IPO. We find that operating performance steadily increases before IPO, peaking in the year immediately prior to flotation. Following IPO, operating performance steadily declines, and within five years is not significantly different from the industry average. We go on to investigate the role of private equity (PE) providers in the performance of buyout IPOs. In contrast with evidence for US venture capital backed non-buyout IPOs, we find no significant difference in pre-IPO or post-IPO operating performance between PE-backed and non-PE-backed buyouts. However, we do find a difference in performance between buyouts backed by prestigious and non-prestigious PE firms. We also find that, consistent with other studies, younger, less experienced PE firms tend to bring their buyouts to IPO more quickly than more experienced PE firms, and that these firms experience lower post-IPO operating performance.

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1. Introduction

The past twenty years has seen a proliferation in buyout activity in the UK. The UK buyout market is the largest in Europe with a value of €30 billion in 2004, representing 38% of the total European buyout market (CMBOR, 2004). Buyouts play an important role in the UK's overall merger and acquisition market and have become one of the most important driving forces in corporate restructuring. Indeed, the value of buyouts in recent years accounts for over half of the value of all takeovers in the UK (CMBOR, 2003/2004). The importance of the buyout market is also manifested through its contribution to the returns of the UK private equity (PE) sector. While the performance of UK PE funds in the early and development stages (i.e. venture capital investment) lags behind that achieved by their US counterparts, PE investment in the buyout markets generates substantial returns (Burgel, 2000; EVCA, 2005).

The increasing number of buyout transactions and the high level of returns that they generate for buyout investors have prompted many to question the source of buyout value. Early evidence on this issue comes mainly from the US where large leveraged buyouts (LBOs) of public corporations or their divisions dominate the market. Several explanations have been put forward as potential sources of buyout value, including tax savings, private information and value creation.¹ However, only the value creation argument seems to have received substantial empirical support. Jensen (1989) asserts that the capital and organisational structures of buyout firms are remarkably efficient in terms of aligning the interest of the managers with that of the buyout investors. Such structures can consequently significantly reduce the principal-agent problems in large, mature companies and ultimately lead to better performance. Consistent with Jensen's view, Kaplan (1989), Smith (1990), Singh (1990) and Muscarella and Vetsuypens (1990) all document an improvement in the accounting performance of US firms that underwent an LBO.

While sharing many common features, notable differences exist between US LBOs and UK buyouts. For example, the source of UK buyouts comprises not only public corporations or their divisions, which are the common targets of US LBOs, but also

¹ See Singh (1990) for a detailed discussion of the alternative explanations of the source of buyout value.

family-run and private businesses and firms that are in receivership (CMBOR, 2004). As a result, buyouts in the UK tend to vary to a greater extent in size than they do in the US. Furthermore, UK buyouts are not as highly geared as their US counterparts and give more preference to the use of equity financing (Wright et al., 1992).² There has also been a significant change in the nature of buyout transactions over time in the UK. Initially, the buyout market in the UK was dominated by management-led buyouts (MBOs) or buy-ins (MBIs), whereby either the incumbent management of a company or a team of outside managers acquires a significant stake in a company, usually in co-operation with outside financiers such as banks or PE investors (Deloitte & Touche LLP, 2004). The proportion of such MBO/MBI transactions in the overall buyout market, however, has declined significantly since the early 1990s. Instead, it is the investor-led buyouts (IBOs) which are becoming more prevalent. PE investors have taken an increasingly proactive style, actively seeking buyout opportunities and taking the lead in the buyout process. Despite these differences, the limited empirical evidence on the performance of UK buyouts appears to echo the findings of US studies for LBOs. In particular, Wright and Wilson (1996) show that UK buyouts on average perform significantly better than non-buyout companies over the three to five years after the buyout transaction, in terms of both return on total assets and profit per employee. These performance improvements have been attributed to both a reduction in agency costs and enhanced entrepreneurial orientation (Green, 1992; Wright et al, 1992; Wright et al, 2001).

While some buyouts remain private for a considerable period, many make their exit at a relatively early stage (Kaplan, 1991; Wright et al., 1995). Flotation on the stock market through an IPO provides one of the most favoured exit routes for buyouts, owing to the attractive financial rewards and the positive reputation effect that often comes with it. The widely documented evidence on the strong performance of buyout firms in general raises the question whether those buyout firms that choose to exit through an IPO are able to sustain such performance after IPO. This is particularly interesting since existing research finds that IPO firms in general experience long run underperformance in terms of stock returns (Ritter, 1991; Loughran et al., 1994) and a gradual decline in operating performance as measured by accounting ratios in the five

² For example, Holthausen & Larcker (1996) report that the mean ratio of debt to total capital for reverse LBOs in the US is 83%. In the UK, in contrast, debt normally accounts for only around 50% of total capital (CMBOR, 2003).

years post-IPO (Jain and Kini, 1994).³ When the post-IPO performance of reverse US LBOs is examined as a separate group, it appears that these companies experience a similar deterioration in their operating performance (Holthausen and Larker, 1996), but no deterioration in stock price performance, suggesting that the market anticipates the decline in operating performance and impounds this expectation into the stock price at the time of IPO (Degeorge and Zeckhauser, 1993). This decline in operating performance has been found to be closely associated with changes in managerial ownership (Bruton et al., 2002). In contrast with the US, evidence on the performance of UK buyout IPOs is scarce and, to date, has focused only on post-IPO stock price performance. In particular, Jelic et al. (2005) examine the stock price performance of a sample of UK buyouts that exit through an IPO and, consistent with studies of US reverse LBOs, find no evidence of significant abnormal returns. Stock returns, however, are only measurable from the day of the IPO and so the question of whether buyout companies are able to sustain their operating performance after exiting through an IPO remains unclear, since any expected decline in operating performance may already have been impounded in the stock price at the time of the IPO. Only by explicitly considering operating performance, which can be measured both pre-IPO and post-IPO, can we evaluate the impact of an IPO on the performance of buyout firms.

A neglected area in buyout research is the impact of PE investors on the performance of buyout firms. While there is a large body of literature on early stage venture capital investment, there has been surprisingly little research into whether the involvement of PE investors adds value to their portfolio firms. The PE industry in the UK is the largest in Europe and second only to the US, globally, with the level of PE investment in the UK equivalent to 1.1% of UK GDP. Of this, only 21% is venture capital financing while 89% is invested in the buyout sector (EVCA, 2005).⁴ The

³ More recently some studies have found that the long-run stock price performance of IPO firms is sensitive to the estimation methods used. See Brav and Gompers (1997), Espenlaub et al. (2000).

⁴ In Europe, the term ‘private equity’ is often used interchangeably with ‘venture capital’. In contrast, in the US, ‘venture capital’ investment refers solely to the provision of equity funds at the start-up or development stage. In Europe, the term ‘venture capital’ is also used to include investments at the buyout stage. To avoid confusion, we use the term ‘private equity’ throughout the paper to describe the industry as a whole, encompassing both venture capital (the seed to expansion stages

development of the UK PE industry over the past two decades has been inextricably linked to the growth in buyout activity. On the one hand, buyout transactions have comprised the largest share of PE investors' returns, while on the other hand, the increasing amount of PE funds available for investment as well as the mounting level of competition within the PE industry has helped drive up both the volume and value of buyout activity. Such a close-knit relationship demands a better understanding of the role that UK PE investors play in the buyout firms that they finance. In particular, do they act solely as financier and limit their contribution to financial engineering, or do they also add value by more actively monitoring and contributing to their portfolio companies as US venture capitalists do?⁵

The objectives of this paper are therefore twofold. Firstly, we evaluate the operating performance of UK buyout firms that exit through an IPO. Using a sample of 178 firms over the period 1980-98, we consider the operating performance of buyouts from three years before IPO until five years following IPO. Secondly, we investigate the impact of PE financing on buyout IPOs. In particular, we test whether the involvement of PE investors significantly affects operating performance in both the pre-IPO and post-IPO periods. We also test the reputation effect of PE investors by considering whether experienced PE investors offer a greater contribution to the operating performance of buyout LBOs. Additionally, we test the grandstanding effect by considering whether young PE investors tend to rush buyout firms to IPO in an attempt to establish their reputation.

We find that operating performance steadily increases before IPO, peaking in the year immediately prior to flotation. Following IPO, operating performance steadily declines, and within five years, is not significantly different from the industry average. In contrast with evidence for US leveraged buyouts, we find no significant difference in pre-IPO or post-IPO operating performance between PE-backed and non-PE-backed buyouts. However, we do find a difference in performance between buyouts

of investment) and buy-outs. When the term 'venture capital' is used, it refers to early stage investment only.

⁵ Jelic et al. (2005) consider the impact of PE investor involvement on the stock price performance of UK buyouts that exited through IPO but find no significant effect. Again, however, by considering only stock price performance, their results are unable to shed light on the expected impact of PE financing on operating performance that is already impounded in the stock price at the time of the IPO.

backed by prestigious and non-prestigious PE firms. We also find that, consistent with other studies, younger, less experienced PE firms tend to bring their buyouts to IPO more quickly than more experienced PE firms, and that these firms experience lower post-IPO operating performance.

The outline of this paper is as follows. In Section 2, we provide a discussion of the relevant theory and develop the hypotheses to be tested. In Section 3, we describe the data and estimation methods. The results of the estimation and hypothesis testing are reported in Section 4. Section 5 offers a summary and conclusion.

2. Existing Literature and Hypothesis Development

2.1 Buyout Performance

Studies of US buyout performance have, in most cases, focused on the measurement of operating performance before and after the leveraged buyout (LBO) of large public corporations or their divisions (see, for example, Smith, 1989; Kaplan, 1989; Singh, 1990; Phan and Hill, 1995). Common measures of operating performance are firms' cash flow or operating income deflated by total assets or sales. Most studies report significant improvement in these measures. For example, Kaplan (1989) finds that in comparison with the year before the buyout, the ratio of operating income to assets of a sample of 48 LBOs increases by 15% while the ratio of operating income to sales increases by 19% over the three-year period after the buyout. Smith (1990) finds that improvements in operating performance are correlated with changes in leverage and managerial ownership induced by the buyout. Such correlation is also documented by Phan and Hill (1995). These findings support Jensen's (1989) view that buyout induced organisational changes have positive impact on firms' performance. Wright et al. (1996) reveal similar improvements in the operating performance of UK buyouts. They tracked 251 UK buyouts for up to six years after the buyout. In the early years, no significant differences in performance are identified. However, three to five years following the transaction, buyout firms on average perform significantly better than comparable non-buyout firms both in terms of the return on total assets and profit to employee measures. Wright et al. attribute this pattern of performance to the fact that buyouts frequently involve underperforming firms and that although action is taken

immediately following the buyout to improve performance, it may take some time before the firm can significantly outstrip the sector average.

It is reasonable to assume that buyouts that manage to exit through an IPO should generally perform well prior to IPO since they have to meet various listing requirements and win the confidence of potential subscribers. In addition, it should be to the advantage of the buyout firm to go public when their performance is relatively strong. We would therefore expect the operating performance of buyout IPOs prior to flotation to be even higher than those of non-IPO buyouts. The first hypothesis that we test is therefore as follows.

H1: Buyout IPOs demonstrate superior operating performance prior to IPO, relative to industry average performance.

The evidence on post-buyout performance improvement provides support for the claim that the buyout as an organisational form is more efficient than the public company. Yet many buyouts choose to float on the market through an IPO a few years after the buyout transaction. Such a phenomenon raises the question of whether the buyout induced performance improvement is sustainable after these firms go public. Indeed, existing research on IPO firms in general have noted a significant decline in operating performance after flotation. For example, Jain and Kini (1994) find that the operating performance of a sample of 682 US IPOs deteriorates significantly relative to the performance in the financial year just before the IPO. In addition, they show that IPO firms outperform their industry average in the year before IPO but underperform the industry average in the first two years after flotation. Jain and Kini find that post-IPO operating performance is positively related to equity retention by the original entrepreneurs. Mikkelsen et al. (1997) finds a similar pattern of performance but note that the decline in performance is confined to the first full year of public trading, with no marked further decline occurring through ten years of public trading. In contrast with other studies, however, Mikkelsen et al. find that the change in equity ownership that result from going public does not lead to a change in incentives that affect operating performance. Rather, they provide evidence that variation in performance after going public is explained largely by the size and age of the companies and by the presence of secondary sales. Size especially is the most

reliable determinant of performance during the first five years after IPO. These results are consistent with Brav and Gompers (1997) who show that long-run stock market underperformance of IPO firms is actually driven by size and book-to-market ratio.

Research on the performance of buyout IPOs has focused on the US reverse LBO market (see, for example, Degeorge and Zeckhauser, 1993; Holthausen and Larker, 1996; Bruton et al., 2002, etc.). Degeorge and Zeckhauser (1993) compare LBO operating performance with matched industry averages for the year before IPO (Year -1) and the year after IPO (Year +1). They find that reverse LBOs perform better than their industry counterparts in Year -1 but worse in Year +1. They observe a positive performance change from Year -1 to the IPO year, but the improvement is not sustained in Year +1. In terms of long run stock price performance, Degeorge and Zeckhauser (1993) find that reverse LBOs do not underperform comparison firms over a two-year horizon after IPO. They interpret this as a sign that the market has already anticipated the decline in post-LBO operating performance. One limitation of this study, however, is that their event window is not wide enough to provide any indication about long-run operating performance. In particular, the decline in operating performance in Year +1 may be a temporary phenomenon caused by a sudden increase in the denominator of the performance measure (the total assets of the firm) as shown in Mikkelsen et al. (1997).

Holthausen and Larker (1996) study the financial performance of reverse LBOs from the year prior to IPO to the fourth year after IPO. They find that the operating performance of their sample LBOs is significantly better than their respective industry average both at the time of IPO and for the four years after it, although they also report weak evidence of deterioration in operating performance in the post-IPO period. They also show that the variation in accounting performance subsequent to IPO is related to changes in the equity ownership of both management and other insiders but not to changes in leverage. Their findings on the long run market performance of the LBOs are consistent with those of Degeorge and Zeckhauser (1993), showing that reverse LBOs do not experience abnormal common stock performance following IPO. Moreover, reverse LBOs appear to be much better at maintaining their pre-IPO level of performance than typical IPO companies. This is

consistent with Mikkelson et al. (1997) as reverse LBOs are normally larger and more established than the typical IPO firm.⁶

The US evidence suggests, therefore, that despite the differences between the reverse LBOs and the typical IPO firm, LBOs are nevertheless susceptible to a decline in post-IPO operating performance. The degree of deterioration, however, appears to be more moderate relative to typical IPO firms. The evidence on whether US LBOs can continuously outperform their industry peers after IPO is mixed. As to the post-IPO performance of buyouts in the UK, evidence is scarce. Jelic et al. (2005) examine the stock price performance of a sample of UK buyouts that exit through IPO. Similar to the US, they find no evidence of significant underperformance in the long run. There is no extant research that investigates the operating performance of UK buyouts after they become public. Given the fact that UK buyouts would experience a change in their capital and organisational structure that is similar to their US counterparts, there is no reason to expect that they would avoid a decline in their post-IPO operating performance. In fact, if changes in post-IPO performance are indeed affected by the size or age of an IPO firm (Mikkelson et al., 1997), an even more marked decline should be expected for UK buyouts as they vary a great deal more in terms of size and age than do US LBOs. Hence our second hypothesis is as follows.

H2: Following flotation, the performance of buyout IPOs gradually declines and their lead over the industry average level diminishes.

2.2 The Role of Private Equity Investors

While a large number of studies (especially those concerning the US market) have investigated the role of the PE investors in venture capital stage investment, research concerning the role that PE investors play at the buyout stage is limited. A number of US studies have compared the post-IPO performance of the IPOs backed by early stage PE investors (VCs) and those with no PE backing. Jain and Kini (1995) argue that VCs in the US not only actively monitor their portfolio firms during the private period but also after IPO. This is because VCs usually continue to maintain a

⁶ Mikkelson et al. (1997) finds that small, young companies underperform industry-matched firms, while the performance of larger and more established firms is similar to the performance of industry-matched firms after going public.

significant equity position in the firm post-IPO, and their long-term continued involvement in the IPO market provides them with the incentive to maintain their reputation by carefully screening their investments and subsequently monitoring their performance in the aftermarket. In the UK, the situation is similar. Indeed, Espenlaub et al. (2001) show that existing shareholders, such as the directors and PE investors of IPO firms in the UK are often subject to more complex lock-in contracts than their US counterparts. In fact, the average length of the lock-in period for directors in the UK is as long as 561 days. Although no direct evidence is available to demonstrate how long PE investors must lock in their shares, it is reasonable to assume that they too will continue holding a significant proportion of equity in their portfolio firms for a considerable length of time after IPO. PE-backed IPOs should therefore continue to outperform non-PE-backed IPOs after flotation. Empirical evidence from the US on early stage PE seems to largely support such a conjecture. Jain and Kini (1995) show that while the performance of both the VC-backed and non-VC-backed groups deteriorates during the post-IPO period, the decline experienced by the VC-backed group is smaller. Furthermore, the market appears to recognise the value added by the VCs as reflected in higher price-earnings and market-to-book ratios at the time of the IPO. In terms of stock market performance, Brav & Gompers (1997) find that the involvement of VCs leads to higher equally-weighted returns during the five years after IPO, although the return differential between the two groups is substantially reduced when value weighting is used, suggesting the existence of a small firm effect.

The evidence presented for European IPOs, however, suggests that European early stage PE investors are less able to contribute to their portfolio firms than are their US counterparts. In their study of UK IPOs, Espenlaub et al. (1999) find only weak evidence that VC backing is associated with better market performance in the long run. More recently, Rinderman (2003) finds that VC-backed issues in the German Neuer Markt, French Nouveau Marche and the UK techMARK do not typically outperform firms without VC backing in terms of either market or accounting performance. The difference in the performance of VC-backed early stage firms in the US and the UK could be partly explained by variation in their experience, knowledge and preferred investment styles. For example, Hege et al. (2003) argue that US VC investors possess sharper screening skills than their European counterparts, which leads to higher success rates among their portfolio firms. This is also consistent with

Landier (2001), who notes that US VC investors spend considerable time learning about the technological aspects of an investment both before and after first-time financing, whereas European VC investors are traditionally less ‘hands on’ than their US counterparts.

The above-presented UK and European evidence on early stage PE investors casts doubt on whether PE-backed buyouts in the UK can produce significantly better performance than non-PE-backed buyouts. While it is understandable that ventures at the start-up/early stage are extremely vulnerable and hence more likely to benefit from the professional monitoring and guidance provided by their PE investors, in the case of buyouts, the level of input they need from the PE providers is probably minimal given their relatively longer operating history and lower risk level. PE involvement may only become important when there are serious problems that threaten the survival of the buyout. In particular, buyouts that reach IPO are more likely to be the strong performers in the PE investor’s portfolio and so PE backing might make little difference to these firms. This would be consistent with Jelic et al. (2005) who find that the involvement of PE investors on the whole does not affect the long run stock performance of buyout IPOs. In view of the evidence discussed above, our third hypothesis is as follows.

H3: PE-backed buyout IPOs do not significantly outperform non-PE-backed IPOs.

2.3 PE Investor Reputation

A number of researchers have addressed the importance of recognising that the knowledge, experience and skills possessed by early stage PE investors (VCs) are heterogeneous (Timmons and Bygrave, 1986; Rindermann, 2003). Reputable VC investors are able to attract and select good quality ventures and make high value-added contributions, which is critical to their portfolio firms’ performance. Research conducted in different countries has produced contradictory findings as to whether VCs add significant value to their portfolio firms. Yet, the empirical evidence seems to be unequivocal when it concerns the impact of reputable VCs on the firms that they back. Rosenstein et al. (1993) show that the entrepreneurs in their sample do not support the contention that, collectively, VC investors bring more ‘value added’ than

other outside board members. Nevertheless, CEOs with a top-20 VC firm as the lead investor do rate the value of the advice from their VC board members significantly higher than the advice from other outside board members. Sapienza et al. (1996) and Manigart et al. (2002) also present evidence that experienced VC investors are perceived to add more value to their portfolio firms than those that are inexperienced. In terms of long run market performance, Espenlaub et al. (1999) find that although VC-backed IPOs do not significantly outperform non-VC-backed IPOs, within the VC-backed sample there are systematic differences in the performance of IPOs associated with the reputation and experience of the VC investors. In particular, IPOs backed by older and/or larger funds experience substantially higher average three-year returns.

In terms of the buyout stage PE investors, consistent with the evidence on early stage PE investors, Jelic et al. (2005) find that although, collectively, PE-backed buyouts do not generate higher long run returns than non-PE-backed buyouts after going public, buyouts backed by more prestigious PE investors perform better than those backed by less prestigious PEs, in all 36 months post-IPO. To test the impact of PE investor reputation on buyout operating performance, our fourth hypothesis is as follows.

H4: Buyout IPOs that are backed by prestigious PE investors are able to produce superior operating performance relative to those backed by not so prestigious PE investors.

2.4 PE Investor Grandstanding

Gompers (1996) has developed a theory called “grandstanding” based on the reputation-building phenomenon in the early stage PE sector (the VC sector). He argues that the reputation of a VC investor is a key determinant in the ability to raise follow-up funds. VC funds typically have a set life span of seven to ten years and it is common practice that VC firms start to raise the follow-up funds before the initial fund is wound up. For young VCs without a long track record to back them up, it is essential to signal to potential investors their ability to generate high returns before raising the new fund. Successfully taking one or more portfolio firms public through an IPO provides an attractive opportunity, not only because of the high returns it may

provide to the PE investors, but also because of the positive publicity associated with it. On the basis of these arguments, Gompers hypothesises that young VCs may bring companies public earlier than the older ones so that they may grandstand and ultimately raise more cash for the follow-up fund. He also finds empirical evidence in support of this argument, showing that the duration of young VC investors' board service is on average fourteen months shorter than that of older VC investors. Moreover, the IPO companies that younger VC firms finance are nearly two years younger and more under-priced when they go public than companies backed by more experienced VC investors. Although Gompers' grandstand argument is developed in the setting of the early stage PE investors (VCs) in the US, we would expect it to be equally applicable to buyout stage PE investors in the UK. Although some PE investors in UK buyouts entered the market as 'captives' with funds provided by their parents, the majority of them are independent or semi-captive and operate under the same system as US VCs. Therefore, they too need to attract funds from external investors and need to establish their reputation by taking buyouts public. To test the applicability of the grandstanding theory in the UK buyout context, we form the following hypothesis.

H5: Buyouts backed by young PEs go to IPO quicker than those backed by more experienced PEs.

Another possible repercussion of grandstanding behaviour is that young PE firms may rush their portfolio firms to the market before they are ready and without the consideration of long term value creation. In comparison with seasoned PE investors, those that have newly entered the private equity market are clearly less skilled and experienced in the selection and monitoring of their portfolio firms. This, coupled with the pressure to grandstand, may mean that firms backed by young PE firms will experience much worse long term operating performance after IPO than those backed by seasoned ones. To date, no empirical studies have examined directly the long run operating performance of IPO firms backed by young PE investors. To test the impact of grandstanding behaviour in buyout firms' performance in the UK, we form the following hypothesis.

H6: *Buyouts backed by young PEs under-perform those backed by more experienced PEs after IPO.*

3. Data Description and Methodology

3.1 Sample Selection

Our sample of UK buyouts which exited through an IPO was collected from the Centre for Management Buyout Research (CMBOR) database at the University of Nottingham. The CMBOR database provides the most comprehensive coverage of all buyout type transactions in the UK and all size categories. There are 405 buyouts in total which went public through LSE, AIM, USM⁷ and EASDAQ between 1980 and 1998. We use 1998 as the cut-off year to ensure that we can follow the operating performance of every sample firm for up to five years after their IPO. We exclude buyouts from the banking, insurance and finance sector and those without the relevant accounting data available for at least one of the three pre-IPO years and one of the five post-IPO years. This leaves a sample of 178 buyout IPOs, of which, 70% (125) are backed by PE investors. Table 1 reports the number of buyouts and IPOs in each year in the sample. Most of the buyouts in the sample took place between the mid-1980s and the early-1990s, and the majority of IPOs cluster around either the late-1980s or the mid-1990s when the stock market was fairly buoyant. 60% of the sample buyouts initially resulted from domestic and foreign divestment, 22% were from privately held firms and the rest were from firms in receivership, privatisation or secondary buyouts.

[Table 1]

Table 2 reports descriptive statistics for the buyout sample. The median size of the initial buyout transactions is £11.5 million in terms of 1990 value. It takes on average between three and four years for a buyout to exit through an IPO, with a median exit time of 37.5 months. The firms in our sample appear to achieve remarkable growth in value during the buyout period, reflected in a much higher market valuation at the

⁷ Unlisted Securities Market (USM) set up in 1980 to provide an easier route to the market for small or new companies. The market closed at the end of 1996. (USM companies could move to the main market or AIM.)

time of IPO. The median market capitalisation at IPO is £32.4 million. PE-backed buyouts are significantly larger than the non-PE-backed buyouts. They also exit much more quickly than non-PE-backed buyouts. Table 2 also shows that the buyouts in the sample experienced notable changes in their organisational structure as a result of IPO. In particular, both the level of leverage and the executive director's share ownership declines significantly. The average pre-IPO leverage stands at 52%, which is relatively modest comparing with the level reported in some US studies on reverse LBOs⁸.

[Table 2]

The accounting data for the post IPO period is collected from Datastream. The relevant pre-IPO accounting data, the offer statistics and the information on changes of organisational structure was hand-collected from the IPO prospectus ordered through Companies House. The information about the PE investors involved is gleaned from a number of sources. For most of our PE-backed buyouts, the CMBOR database provides the names of the lead PE investors as well as the syndicated PE investors. The founding year of the PE firms is collected either through the BVCA website or directly from senior practitioners in the PE sector.

We examine the operating performance of the 178 sample buyouts for the period of three years prior to IPO and five years after IPO. This choice of a relatively long window enables us to ascertain whether changes in performance are transitory or more long-lasting. Year -1 is the last full financial year immediately before the completion of the IPO and Year +1 is the first full financial year immediately after the completion of IPO. We do not include the performance in Year 0, i.e. the financial year during which the IPO takes place. This is because some buyouts may be operating as a private firm for most of the year 0, while others may have already completed the IPO and operated as a public corporation for most of the year. This potentially makes interpretation of the results for Year 0 difficult. As we do not require our sample firms to have accounting data available for the entire time window, the usable observations for different tests vary across each year.

⁸ For example, Holthausen and Larcker (1996) report a mean leverage of 83% for their sample of LBOs. Their definition of the leverage is identical to ours.

3.2 Measurement of Operating Performance

We adopt three accounting ratios to measure operating performance. These are cash flow to total assets (CF/TA), sales to total assets (S/TA) and cash flow to sales (CF/S). We use operating cash flow (CF) before interest and tax to avoid the mechanical effect of leverage on the results. We favour the CF measure as opposed to operating income as it is less susceptible to accounting manipulation. Direct cash flow data is only available through Datastream for the period after mid 1990. This is because the reporting of cash flow by the publicly traded firms has only been compulsory in the UK since 1992. As the IPOs in our sample took place both in the 1980s and the 1990s, we had to choose a cash flow proxy that is available for all periods. Our cash flow measure is computed using net sales less cost of goods sold and selling, general and administrative expense before any depreciation depletion and amortisation which has been deducted.

The CF/TA ratio has been used extensively in many past studies as a key measure of performance (for example Kaplan, 1989; Jain and Kini, 1994; Holthausen and Larker, 1996), providing an indication of the level of returns on total assets. S/TA, also known as ‘asset turnover’, is a measure of a firm’s efficiency in asset utilisation. CF/S can be viewed as a profit margin measure. The fact that CF/TA is the product of asset turnover (S/TA) and margin (CF/S) enables us to discern whether the variation in return on assets is caused by changes in a firm’s effectiveness in asset utilisation or its ability to maintain or improve its margin. The use of asset-based ratios, however, may impose a downward bias in performance for the years immediately after the IPO. The completion of an IPO frequently leads to a sudden increase in a firms’ asset base. A decline in accounting ratios with total assets as denominator may occur without any real changes in performance taking place.

We assess both the unadjusted and the industry-adjusted performance. The industry level performance is computed using the average cash flow, sales and total assets of the firms sharing the same Datastream Level 4 sector classification code with our sample firms. The industry adjustment is made by subtracting the contemporaneous industry level performance from each of the sample firms. As our sample buyouts

come from a broad range of sectors and exited through IPOs at different point of time, the industry adjustment allows us to control for both time period and industry effects. We use the Wilcoxon sign rank test to test whether industry adjusted performance is significantly different from zero. We also measure the change in operating performance as the median percentage change in the level of the performance measure (cash flow to total assets, asset turnover or cash flow to sales) against its level in Year -1. Instead of simply taking the difference of the ratios, we use the percentage change to measure the degree of change in performance. This makes cross sectional comparison more meaningful. We again use the Wilcoxon sign rank test to test whether the percentage change in the performance measure relative to Year -1 is significantly different from zero.

3.3 Measurement of PE Influence

To test the hypotheses related to PE investor involvement, we compare the operating performance between the different sample groups using Wilcoxon two sample test⁹. For the effect of PE backing, we test the difference in the median performance ratios between the PE-backed and the non-PE-backed groups. For the influence of PE investor reputation on buyout performance, we compare the median performance ratios between the group of buyouts with more prestigious PE firms as their lead investor and the group whose lead investors are not as prestigious. Similarly, to test the grandstanding hypothesis, we compare the differences in performance and the number of months for a buyout to achieve an IPO between the buyouts whose lead PE investment firms aged ten years or younger at the time of the buyout and those with more seasoned PE firms as their lead investor.

We set the criterion for the reputable PE firms as the ones with at least 3% of total UK market share in terms of the number of buyout transactions backed between 1980 and 1997. This is the approach adopted by Jelic et al.(2005) in their study of the market performance of a sample of buyout IPOs. Based on this criterion, we identify the same three top PE investors, namely *3i*, *NatWest Equity Partners* and *Barclays Private*

⁹ We also conduct cross-sectional regression analysis to determine if differences in performance exist after controlling for other likely determinants of post-issue performance. The control variables we include are Size (Market capitalisation at IPO), Offer size (% shares offered), Changes in leverage and Changes in executive directors' share holding. Our results are unaffected by the inclusion of these variables.

Equity. An alternative proxy for PE reputation is the number and size of PE funds raised by the PE investors. However, such data is not readily available in the UK. Our criterion for young PE has also been used in various other studies (Gompers, 1996; Barnes et al., 2003). Gompers defined young VC firms as those aged six years or under. They also tested eight and ten years as the cut-off for VC age but find that their results are unaffected. As the number of buyouts backed by PE investors in our study is not large, we choose ten years as our cut-off to ensure a reasonable sample size.

4. Results

4.1 Buyout Performance

Table 3 reports the median operating performance from the three years pre-IPO until five years post-IPO, and also the average operating performance over the pre-IPO and post-IPO periods. The first panel reports the median level of cash flow to total assets, the second panel reports the median asset turnover and the third panel reports the median cash flow to sales. In each case, the figures are reported both before and after industry adjustment. To facilitate the interpretation of our results, Figures 1-3 plot the three measures of operating performance both for the sample of buyout firms and for the industry average. From Panel A, we can see that median cash flow to total sales for buyout firms tends to rise in the three years before IPO reaching a peak at 20.82% in the year before IPO, but then falls steadily after IPO. In all years but one, buyout operating performance is significantly higher than the industry average. This difference also rises steadily in the three years before IPO, reaching a peak of 4.00% in the year immediately prior to IPO, but then falls steadily after IPO. By five years after IPO, cash flow to total assets for buyout firms is not significantly different from the industry average. These results are consistent with our hypotheses H1 and H2. In particular, it is apparent that buyout operating performance is higher than average before IPO, but steadily declines following IPO.

We can identify the source of this pattern of operating performance in Panels B and C. Asset turnover (Panel B) is very significantly higher than average in every year, but falls almost monotonically from three years before IPO to five years after IPO. In contrast, cash flow to sales (Panel C) rises steadily for the three years pre-IPO and

declines steadily for the five years after IPO, but is actually lower than the industry average in all years except the one year either side of IPO. In no year is industry-adjusted cash flow to sales significantly different from zero. Thus the high level of cash flow to total assets is accounted for by a very high level of asset turnover, which is partially offset by relatively low cash flow to sales. But the *change* in cash flow to total assets, relative to the industry average, is accounted cash flow to sales which rises steadily before IPO but declines steadily after IPO. The change in asset turnover offsets the rise in cash flow to sales before IPO but compounds the fall in cash flow to total assets after IPO, leading to a large decline in operating performance.

[Table 3]

[Figures 1-3]

Table 4 presents the median percentage change in operating performance relative to Year -1 for each of the performance measures, both with and without industry adjustment. Here we can clearly see the dynamics of operating performance over the pre-IPO and post-IPO periods. Three years before IPO, cash flow to total assets (Panel A) is more than 20 percent lower than its Year -1 level before industry adjustment, and more than 40 percent lower after industry adjustment. After IPO, operating performance steadily declines, reaching 31 percent below its Year -1 level before industry adjustment and 68 percent below it after industry adjustment. Even for the first year after IPO, there is a statistically significant reduction in adjusted operating performance. There is no significant change in asset turnover pre-IPO (Panel B), but a very significant decline relative to the Year -1 level post-IPO. Cash flow to sales (Panel C) in almost all cases, both pre-IPO and post-IPO, is very significantly lower than the Year -1 level.

[Table 4]

4.2 The Role of Private Equity Investors

Table 5 reports the three measures of operating performance for the two sub-groups of buyout IPOs that were PE-backed and not PE-backed, respectively. Operating

performance is reported both in absolute terms, and relative to average industry performance. In terms of cash flow to assets (Panel A), PE-backed and non-PE-backed buyouts both display a similar pattern of operating performance. Prior to IPO, PE-backed buyouts marginally outperform non-PE-backed buyouts, in both absolute terms and industry-adjusted terms, while after IPO, non-PE-backed buyouts marginally outperform PE-backed buyouts. However, in no year is the difference between the two groups statistically significant.

In terms of asset turnover (Panel B), Non-PE-backed buyouts tend to outperform PE-backed buyouts up until two years before IPO and following three years after IPO. But for the period immediately before and after IPO, PE-backed buyouts outperform non-PE-backed buyouts, although the differences are not statistically significant. In terms of industry relative performance, PE-backed buyouts outperform non-PE-backed buyouts for the entire post-IPO period. In terms of cash flow to sales (Panel C), the converse situation arises: PE-backed buyouts outperform non-PE-backed buyouts before IPO but non-PE-backed buyouts outperform PE-backed buyouts after IPO. Again, however, the differences are insignificant. Our results therefore tend to support our hypothesis H3 that PE investor involvement has no impact on the operating performance of buyout LBOs. These results are consistent with Espenlaub et al. (1999) and Rinderman (2003) who find a similar result for UK and European IPOs of non-buyout firms.

[Table 5]

Table 6 presents the median percentage change in operating performance relative to Year -1 for PE-backed and non-PE-backed buyouts. The p-values (reported in parentheses) test the null hypothesis that the percentage change relative to Year -1 is the same for the PE-backed and non-PE-backed groups. From Panel A, it can be seen that while both groups experience considerable underperformance relative to Year -1 in both the pre-IPO and post-IPO periods, the degree of underperformance is more extreme for the PE-backed buyouts. This is particularly evident after adjusting for industry average performance: Year -3 performance is 49.65% below Year -1 performance for PE-backed buyouts, but only 1.47% below Year -1 performance for non-PE-backed buyouts. The same is true for other years in the sample, but the

difference declines towards the end of the post-IPO period. Only for Year -3 and Year +1 is the difference between the PE-backed and non-PE-backed buyouts statistically significant.

[Table 6]

4.3 PE Investor Reputation

Table 7 reports the three measures of operating performance for the two sub-groups of buyout IPOs that were backed by the top three PE firms and by other PE firms, respectively. In terms of cash flow to assets (Panel A), buyouts backed by one of the top three PE firms tend to perform better than those backed by less prestigious PE firms in all years from three years pre-IPO to four years post-IPO. Only in the last year – five years post-IPO – do buyouts backed by the top three PE firms perform worse than those backed by other PE firms, and the difference is relatively small. The picture is similar in terms of industry adjusted performance although there are two years in which buyouts backed by the top three PE firms perform worse than those backed by other PE firms (Year -1 and Year +2). Buyouts backed by the top three PE firms also perform better in almost all years in terms asset turnover (Panel B). However, they perform very markedly worse in terms of cash flow to sales (Panel C). These results confirm our hypothesis H4, that buyouts backed by prestigious PE firms tend to perform better than those backed by less prestigious PE firms. However, the results suggest that the source of this performance gain is in asset turnover, not cash flow.

[Table 7]

Table 8 reports the median percentage change in operating performance relative to Year -1 for the buyouts backed the three top PE firms and those backed by the less prestigious PEs. On the whole, both groups experience negative changes in their performance relative to the Year -1 level. Although not statistically significant, the decline experienced by the top three PE backed buyouts appear to be more moderate than that by the other group except in the case of industry adjusted asset turnover in Year +1, +3 and +4. In terms of the overall return on assets, the top three PE backed

buyouts experience a significantly smaller decline relative to the group of other PE backed buy-outs in the first three years after the IPO. However, there is no marked difference between the degree of changes in the two groups towards the end of period. Our results suggest that buyouts backed by three top PE firms are better at maintaining their pre-IPO level of performance in the first three years after the IPO. As most PE firms should have completed their exit at the end of Year +3, it is not surprising no significant differences are found in Year +4 and +5.

[Table 8]

4.4 PE Investor Grandstanding

Table 9 reports the three measures of operating performance for the two sub-groups of buyout IPOs that were backed by young PE firms and other PE firms, respectively. On average, cash flow to assets for the buyouts backed by young PE firms is lower than those backed by other PE firms, both for the three years before IPO and the five years after IPO, although there is considerable variation within each period. Buyouts backed by young PE firms tend to do particularly badly immediately following IPO, but the difference subsequently narrows, and by five years after IPO, they are outperforming buyouts that were backed by other PE firms. The underperformance of buyouts backed by young PE firms is evident both in terms of absolute performance and industry-adjusted performance. The results are therefore consistent with our hypothesis H6, that buyouts backed by young PE firms tend to perform worse than those backed by other, more experienced PE firms, after IPO. From Panels B and C, we can identify the source of this underperformance. Industry-adjusted asset turnover (Panel B) is lower for buyouts backed by young PE firms for the entire pre-IPO period, but after IPO, asset turnover tends to be higher for this group. In contrast, industry-adjusted cash flow to sales is higher for buyouts backed by young PE firms during the pre-IPO period, but uniformly lower in the post-IPO period. Thus, young PE firms contribute less to the post-IPO performance of the firms that they back because they generate lower cash flow to sales, despite generating higher asset turnover.

[Table 9]

Table 10 reports the median percentage change in operating performance relative to Year -1 for the buyouts backed young PE firms and those backed by the more seasoned PE firms. The young PE backed group appears to experience a smaller decline in asset turnover in most of the post-IPO years and the difference is particularly significant in Year +1 and Year +4. However, the better relative performance in asset turnover is more than offset by a marked decline in cash flow to sales. In all but Year +5, the young PE-backed group performance deteriorates at a greater rate than the other PE-backed group and the differences are statistically significant at least at the 5% level. As a result, the young PE backed buyouts appear to experience far more pronounced decline in their return on assets in the post IPO years, although the differences are less marked after Year +3.

[Table 10]

Table 11 reports statistics on the number of months from buyout to IPO. For young PE-backed buyouts, the median time to IPO is 27.5 months, compared to 35 months for other PE-backed buyouts, and 39 months for all other PE-backed and non-PE-backed buyouts. The difference between the young PE-backed and other PE-backed buyouts, while consistent with our hypothesis H5 that buyouts backed by young PE firms go to IPO quicker than those backed by more experienced PE firms, is not significant statistically. However, the median time to IPO for young PE-backed buyouts is significantly shorter than the median time to IPO for all PE-backed and non-PE-backed buyouts.

[Table 11]

5. Summary and Conclusion

In this paper we evaluate the operating performance of buyout firms that exit through IPOs using a sample of 178 UK companies over the period 1980-1998. In particular, we consider the operating performance of buyout firms, measured by cash flow to total assets, asset turnover and cash flow to sales, from three years before IPO to five years following IPO. We find that buyout firms produce higher than industry average performance as measured by cash flow to total assets in both pre-IPO and post-IPO

periods. This performance seems to be achieved through a better ability to utilise the asset base to generate sales rather than through higher margin. This is consistent with the industry anecdotal evidence that buy-out firms commonly spin off non-performing or peripheral businesses and are able to operate on a very 'lean' asset base. Their inability to generate more attractive margin than the industry average level loosely suggest that they are not particularly strong in terms of cost reduction or the development of premium products.

Buy-out firms generally experience remarkable improvement in their performance in the three years before IPO. The performance reaches its peak in Y-1 (the financial year immediate before the completion of the IPO). Such performance, however, appear to be unsustainable. When compared with the Y-1 level of performance, buy-outs experience marked decline in cash flow to total assets in the five years post IPO. The decline seems to be caused by the deterioration in both asset turnover and margin. The finding is in line with both Jain and Kini (1994) on the post IPO operating performance of a sample of US non-buy-out IPOs, and Holthausan and Larker (1996) on the performance of US reverse LBOs.

We go on to investigate the role of PE providers in the operating performance of buyout IPOs. In contrast with evidence for US venture capital backed non-buyout IPOs, we find no significant difference in pre-IPO or post-IPO operating performance between PE-backed and non-PE-backed buyouts. However, there is weak evidence that buyouts backed by the three leading PE firms in the UK experience a relatively smaller decline in their post IPO performance. Buy-outs backed by young PE firms do appear to take their portfolio buyouts to market much quicker than the more seasoned PE firms although the result is not highly significant. Firms backed by young PE firms do not perform significantly differently from other PE firms overall, but it appears that they experience a more severe decline in margin but a less drastic reduction in asset turnover in the post IPO period.

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Table 1: Buyout/IPO Year Distribution

Year	No. of buyouts	PE-backed	Non-PE-backed	No. of IPO exits
Pre 1980	3	1	2	-
1980	4	-	4	-
1981	3	-	3	-
1982	1	-	1	-
1983	2	1	1	-
1984	6	2	4	2
1985	5	4	1	7
1986	7	7	-	14
1987	10	9	1	12
1988	7	7	-	20
1989	11	10	1	5
1990	14	12	2	2
1991	11	9	2	0
1992	7	6	1	8
1993	9	8	1	16
1994	3	2	1	26
1995	3	3	-	15
1996	-	-	-	27
1997	3	2	1	19
1998	-	-	-	5
Missing	69	42	27	-
Total	178	125	53	178

Table 2: Sample Descriptive Statistics

Buyout value is a value of buyout transaction in million of GBP in 1990 value; Market Value at IPO is market capitalisation in millions of GBP in 1990 value; Time from buyouts to IPO is the number of months from buyout transaction to listing; Executive director's shareholding is the total number of beneficial common equity held by the executive directors as a percentage of the total number of common equity of the firm. Leverage is measured by the book value of total debt divided by the book value of the total assets.

Variable	Median	Mean	Min	Max	St. Dev.	Observations
Buyout value	11.5	55.7	0.2	2361.5	214.7	142
Buyout value - PE-backed	18.1	69.5	0.3	2361.5	241.2	111
Buyout value - non-PE-backed	4.3	6.3	0.2	47.7	8.8	31
Market Value at IPO	32.4	57.1	4.1	609.3	77.1	171
Market Value at IPO - PE-backed	40.6	71.2	4.1	609.3	87.1	120
Market Value at IPO - non-PE-backed	17.4	24.1	4.2	159.3	24.2	51
Time from buyout to IPO	37.5	45.7	4.0	183.0	31.5	172
Time from buyout to IPO - PE-backed	33.0	41.3	4.0	114.0	27.6	121
Time from buyout to IPO - non-PE-backed	51.0	56.1	4.0	183.0	37.5	51
Executive Directors' Share holding %						
Pre-IPO	25.0	34.7	0.2	100.0	28.7	97
Post-IPO	15.5	20.7	0.0	78.2	18.7	113
Change	-8.7	-13.1	-76.2	6.7	13.2	97
Leverage % (Total debt to Total Assets)						
Pre-IPO	35.6	51.7	0.0	499.5	66.7	124
Post-IPO	13.0	16.1	0.0	75.5	15.9	159
Change	-16.4	-34.1	-443.9	54.3	63.1	121

Table 3: Median Operating Performance

Cash flow equals net sales less cost of goods sold and selling, general and administrative expense before depreciation depletion and amortisation. Asset Turnover equals total sales to total assets. Year -1 is the last full financial year immediately before the IPO completion year and Year +1 is the first full financial year immediately after the IPO completion year. Year -3, Year -2, Year +2 to Year +5 work on the same principle. 3 Year Avg and 5 Year Avg refer to the mean performance of the first three years and the five years after IPO respectively. Industry performance is computed by using the industry average of the relevant accounting items. industry adjustment is made by subtracting the matched industry performance from the performance of each sample firm. The industry performance is matched by year and by Datastream sector classification level 4 code. The significance levels reported for industry adjusted performance are based on the Wilcoxon matched sample test.

Year Relative to the Completion of IPO	Year -3	Year -2	Year -1	Year +1	Year +2	Year +3	Year +4	Year +5	3 Year Avg	5 Year Avg
Panel A: Cash Flow to Total Assets										
Before industry adjustment	0.1834	0.1741	0.2082	0.1934	0.1881	0.1788	0.1681	0.1565	0.1942	0.1878
After industry adjustment	0.0173^c	0.0340^a	0.0557^a	0.0400^a	0.0222^a	0.0328^a	0.0245^a	0.0047	0.0322^a	0.0283^a
Observations	96	100	113	127	132	133	127	124	116	98
Panel B: Asset Turnover										
Before industry adjustment	1.7605	1.7227	1.6869	1.4916	1.5359	1.4441	1.3832	1.3915	1.5513	1.5712
After industry adjustment	0.5359^a	0.5300^a	0.4806^a	0.3565^a	0.3062^a	0.3781^a	0.3455^a	0.3211^a	0.3480^a	0.4236^a
Observations	105	108	122	159	163	159	140	132	144	120
Panel C: Cash Flow to Sales										
Before industry adjustment	0.0950	0.1207	0.1436	0.1529	0.1388	0.1359	0.1230	0.1193	0.1404	0.1424
After industry adjustment	-0.0279	-0.0056	0.0135	0.0004	-0.0056	-0.0056	-0.0139	-0.0226	0.0003	-0.0107
Observations	104	109	117	129	135	135	129	126	118	100

^a Significantly different from zero at 0.01 level (Two tailed test).

^b Significantly different from zero at 0.05 level (Two tailed test).

^c Significantly different from zero at 0.10 level (Two tailed test).

Table 4: Median Percentage Change in Operating Performance Relative to Year -1

Cash Flow equals net sales less cost of goods sold and selling, general and administrative expense before depreciation depletion and amortisation. Asset Turnover equals total sales to total assets. Year -1 is the last full financial year immediately before the IPO completion year and Year +1 is the first full financial year immediately after the IPO completion year. 3 Year Avg and 5 Year Avg refer to the mean performance of the first three years and the five years after IPO respectively. Industry performance is computed by using the industry average of the relevant accounting items. industry adjustment is made by subtracting the matched industry performance from the performance of each sample firm. The % change is computed by subtracting Year -3 level of performance from each year's performance and then dividing the difference by the year-3 level. The significance levels reported are based on the Wilcoxon one sample test.

Year Relative to Completion of IPO	Year -2 relative to Year -3	Year -1 relative to Year -3	Year +1 relative to Year -3	Year +2 relative to Year -3	Year +3 relative to Year -3	Year +4 relative to Year -3	Year +5 relative to Year -3	3 Year Avg to Year -3	5 Year Avg to Year -3
Panel A: Percentage Change in Cash Flow to Total Assets									
% change before industry adjustment	4.81%	20.60% ^a	8.77% ^b	20.14% ^b	6.90% ^c	10.15% ^b	-8.24%	8.11% ^b	6.12% ^c
% change after industry adjustment	13.06%	20.30% ^b	-17.34%	-14.52%	-35.58%	-23.85%	-28.99%	-14.09%	-6.12%
Observations	49	49	36	35	37	31	32	33	30
Panel B: Percentage Change in Assets Turnover									
% change before industry adjustment	2.12%	1.44%	-6.74% ^b	-10.17% ^b	-11.62% ^c	-9.04%	-15.17%	-12.72% ^b	-12.1283%
% change after industry adjustment	2.77%	-5.74%	-36.35% ^b	-35.12% ^b	-35.69% ^c	-14.23%	-18.41%	-37.99% ^c	-27.03%
Observations	52	53	50	51	48	40	37	45	35
Panel C: Percentage Change in Cash Flow to Sales									
% change before industry adjustment	8.67% ^a	20.57% ^a	28.24% ^a	31.39% ^a	20.97% ^a	26.94% ^a	18.48% ^b	26.26% ^a	24.25% ^b
% change after industry adjustment	12.15% ^c	24.48% ^b	-1.51%	6.58%	11.61%	14.73%	4.81%	14.00%	3.43%
Observations	52	52	39	38	40	34	35	35	31

^a Significantly different from zero at 0.01 level (Two tailed test).

^b Significantly different from zero at 0.05 level (Two tailed test).

^c Significantly different from zero at 0.10 level (Two tailed test).

Table 5: Median Operating Performance - PE backed vs. Non-PE backed buy-outs

Cash Flow equals net sales less cost of goods sold and selling, general and administrative expense before depreciation depletion and amortisation. Asset Turnover equals total sales to total assets. Year -1 is the last full financial year immediately before the IPO completion year and Year +1 is the first full financial year immediately after the IPO completion year. 3 Year Avg and 5 Year Avg refer to the mean performance of the first three years and the five years after IPO respectively. Industry performance is computed by using the industry average of the relevant accounting items. industry adjustment is made by subtracting the matched industry performance from the performance of each sample firm.

Year Relative to Completion of IPO		Year -3	Year -2	Year -1	Year +1	Year +2	Year +3	Year +4	Year +5	3 Year Avg	5 Year Avg
Panel A: Cash Flow to Total Assets											
Pre-ind. adjustment:	PE backed	0.1676	0.1907	0.2205	0.1831	0.1812	0.1753	0.1641	0.1537	0.1793	0.1806
	Non-PE backed	0.1447	0.1452	0.1892	0.2231	0.2027	0.1854	0.1702	0.1630	0.2469	0.2067
Post-ind. adjustment:	PE backed	0.0193	0.0351	0.0655	0.0334	0.0148	0.0321	0.0227	-0.0040	0.0279	0.0239
	Non-PE backed	-0.0075	0.0329	0.0371	0.0478	0.0480	0.0430	0.0226	0.0084	0.0604	0.0475
Observations	PE backed	76	79	90	92	92	88	82	82	83	68
	Non-PE backed	20	21	23	35	40	44	44	41	33	30
Panel B: Assets Turnover											
Pre-ind. adjustment:	PE backed	1.7605	1.6960	1.7395	1.5452	1.6188	1.4482	1.3898	1.3915	1.6346	1.5754
	Non-PE backed	1.8002	1.9007	1.5143	1.4582	1.4116	1.4397	1.4354	1.4450	1.4479	1.5321
Post-ind. adjustment:	PE backed	0.5208	0.4754	0.5139	0.3623	0.3150	0.3943	0.3842	0.3352	0.4128	0.4503
	Non-PE backed	0.5965	0.6438	0.3424	0.2037	0.2584	0.2423	0.3045	0.3117	0.2135	0.2558
Observations	PE backed	82	84	94	116	117	111	97	91	104	86
	Non-PE backed	24	25	29	45	49	50	46	43	42	36
Panel C: Cash Flow to Sales											
Pre-ind. adjustment:	PE backed	0.1033	0.1240	0.1490	0.1495	0.1388	0.1328	0.1192	0.1128	0.1382	0.1356
	Non-PE backed	0.0880	0.1107	0.1137	0.1636	0.1384	0.1374	0.1330	0.1294	0.1490	0.1489
Post-ind. adjustment:	PE backed	-0.0243	-0.0079	0.0187	0.0004	-0.0060	-0.0071	-0.0196	-0.0249	-0.0065	-0.0181
	Non-PE backed	-0.0344	0.0042	-0.0080	0.0004	-0.0053	-0.0056	-0.0063	-0.0158	0.0134	-0.0048
Observations	PE backed	78	81	91	93	93	89	83	83	84	69
	Non-PE backed	24	25	26	36	42	45	45	42	34	31

Table 6: Percentage Change in Operating Performance - PE-backed vs. Non-PE-backed Buyouts

Cash Flow equals net sales less cost of goods sold and selling, general and administrative expense before depreciation depletion and amortisation. Asset Turnover equals total sales to total assets. Year -1 is the last full financial year immediately before the IPO completion year and Year +1 is the first full financial year immediately after the IPO completion year. 3 Year Avg and 5 Year Avg refer to the mean performance of the first three years and the five years after IPO respectively. Industry performance is computed by using the industry average of the relevant accounting items. industry adjustment is made by subtracting the matched industry performance from the performance of each sample firm. The % change is computed by subtracting Year -1 level of performance from each year's performance and dividing the difference by the year-1 level. The p-values reported are based on the Wilcoxon two sample difference test (two tailed).

Year Relative to Completion of IPO		Year -3 to Year -1	Year -2 to Year -1	Year +1 to Year -1	Year +2 to Year -1	Year +3 to Year -1	Year +4 to Year -1	Year +5 to Year -1	3 Year Avg to Year -1	5 Year Avg to Year -1
Panel A: Percentage Change in Cash Flow to Total Assets										
Pre-ind. adjustment:	PE-backed	-22.65%	-13.97%	-5.91%	-10.80%	-13.45%	-21.93%	-31.13%	-11.12%	-17.72%
	Non-PE-backed	-13.97%	-10.54%	7.12%	-3.22%	-3.57%	-16.84%	-20.89%	2.17%	-13.04%
	p-value	[0.2302]	[0.3205]	[0.1003]	[0.9488]	[0.4597]	[0.4287]	[0.6071]	[0.2373]	[0.6771]
Post-ind. adjustment:	PE-backed	-49.65%	-26.26%	-30.89%	-35.88%	-42.47%	-51.09%	-69.10%	-34.89%	-39.73%
	Non-PE-backed	-1.47%	-5.36%	18.02%	-26.64%	-38.59%	-80.39%	-66.82%	-18.73%	-36.13%
	p-value	[0.0824]	[0.3279]	[0.0902]	[0.4138]	[0.4374]	[0.9162]	[0.606]	[0.2863]	[0.9869]
Panel B: Percentage Change in Assets Turnover										
Pre-ind. adjustment:	PE-backed	-3.86%	-2.44%	-8.29%	-11.92%	-11.32%	-12.26%	-16.58%	-8.99%	-12.69%
	Non-PE-backed	3.05%	3.30%	-16.07%	-17.44%	-14.37%	-12.21%	-5.28%	-13.85%	-8.01%
	p-value	[0.1909]	[0.0464]	[0.3371]	[0.1592]	[0.3716]	[0.7926]	[0.4358]	[0.4312]	[0.7437]
Post-ind. adjustment:	PE-backed	-8.60%	-4.69%	-32.75%	-31.30%	-30.82%	-34.52%	-38.22%	-28.84%	-31.05%
	Non-PE-backed	22.72%	21.01%	-26.78%	-33.06%	-13.11%	-10.18%	-5.19%	-22.14%	-16.00%
	p-value	[0.0308]	[0.0267]	[0.9645]	[0.7053]	[0.949]	[0.5311]	[0.2882]	[0.8643]	[0.8597]
Panel C: Percentage Change in Cash Flow to Sales										
Pre-ind. adjustment:	PE-backed	-19.79%	-11.70%	3.37%	-0.60%	-0.35%	-6.25%	-10.17%	-1.57%	-5.58%
	Non-PE-backed	-23.93%	-11.44%	3.16%	6.47%	-1.30%	-7.65%	-23.27%	2.94%	-13.06%
	p-value	[0.7556]	[0.5045]	[0.2895]	[0.6592]	[0.7894]	[0.8891]	[0.342]	[0.5589]	[0.9304]
Post-ind. adjustment:	PE-backed	-44.21%	-21.19%	-1.05%	-17.72%	-16.58%	-26.02%	-44.74%	-8.38%	-16.47%
	Non-PE-backed	-18.92%	-11.41%	-20.51%	-2.03%	-17.98%	-47.37%	-59.31%	-15.34%	-12.23%
	p-value	[0.1815]	[0.2384]	[0.5283]	[0.6358]	[0.5822]	[0.4734]	[0.8664]	[0.8722]	[0.714]

Table 7: Median Operating Performance - Buyouts Backed by Top Three PE Firms vs. Buyouts Backed by Other PE Firms

Cash Flow equals net sales less cost of goods sold and selling, general and administrative expense before depreciation depletion and amortisation. Asset Turnover equals total sales to total assets. Year -1 is the last full financial year immediately before the IPO completion year and Year +1 is the first full financial year immediately after the IPO completion year. 3 Year Avg and 5 Year Avg refer to the mean performance of the first three years and the five years after IPO respectively. Industry performance is computed by using the industry average of the relevant accounting items. industry adjustment is made by subtracting the matched industry performance from the performance of each sample firm. Top Top 3 PE investors refer to the 3 PE firms which backed the largest number of buy-outs from 1980 to 1998.

Year Relative to Completion of IPO		Year -3	Year -2	Year -1	Year +1	Year +2	Year +3	Year +4	Year +5	3 Year Avg	5 Year Avg
Panel A: Cash Flow to Total Assets											
Pre-ind. adjustment:	Top 3 PE backed	0.1822	0.1852	0.2250	0.2101	0.2122	0.1938	0.1913	0.1370	0.2047	0.1936
	Other PE backed	0.1487	0.1795	0.2165	0.1711	0.1709	0.1659	0.1641	0.1537	0.1637	0.1676
Post-ind. adjustment:	Top 3 PE backed	0.0159	0.0405	0.0619	0.0552	0.0459	0.0463	0.0461	0.0013	0.0480	0.0287
	Other PE backed	0.0133	0.0250	0.0661	0.0189	0.0069	0.0120	0.0044	-0.0021	0.0070	0.0133
Observations	Top 3 PE backed	27	29	33	27	28	28	26	25	26	23
	Other PE backed	38	39	46	41	39	39	34	34	39	29
Panel B: Assets Turnover											
Pre-ind. adjustment:	Top 3 PE backed	1.8569	1.6709	1.7275	1.6872	1.6915	1.6302	1.5003	1.4541	1.7319	1.6502
	Other PE backed	1.7424	1.7031	1.7316	1.5472	1.5894	1.3922	1.4013	1.3973	1.6488	1.5774
Post-ind. adjustment:	Top 3 PE backed	0.7043	0.4687	0.4834	0.3696	0.4076	0.4081	0.4170	0.5269	0.4886	0.4422
	Other PE backed	0.3742	0.5043	0.5294	0.2599	0.2643	0.3299	0.3078	0.2465	0.3770	0.4577
Observations	Top 3 PE backed	27	29	33	33	32	31	28	27	30	26
	Other PE backed	42	42	49	48	47	46	40	36	46	36
Panel C: Cash Flow to Sales											
Pre-ind. adjustment:	Top 3 PE backed	0.0937	0.1120	0.1396	0.1335	0.1373	0.1116	0.1145	0.0992	0.1297	0.1101
	Other PE backed	0.1000	0.1318	0.1562	0.1510	0.1399	0.1383	0.1156	0.1254	0.1404	0.1440
Post-ind. adjustment:	Top 3 PE backed	-0.0362	-0.0094	0.0016	-0.0085	-0.0220	-0.0164	-0.0240	-0.0287	-0.0083	-0.0262
	Other PE backed	-0.0207	0.0048	0.0270	0.0186	0.0062	-0.0004	-0.0153	-0.0198	0.0052	-0.0037
Observations	Top 3 PE backed	27	29	33	30	30	29	27	26	29	26
	Other PE backed	40	41	48	41	40	40	35	35	40	30

Table 8: Percentage Change in Operating Performance - Buyouts Backed by Top Three PE Firms vs. Buyouts Backed by Other PE Firms

Cash Flow equals net sales less cost of goods sold and selling, general and administrative expense before depreciation depletion and amortisation. Asset Turnover equals total sales to total assets. Year -1 is the last full financial year immediately before the IPO completion year and Year +1 is the first full financial year immediately after the IPO completion year. 3 Year Avg and 5 Year Avg refer to the mean performance of the first three years and the five years after IPO respectively. Industry performance is computed by using the industry average of the relevant accounting items. industry adjustment is made by subtracting the matched industry performance from the performance of each sample firm. The % change is computed by subtracting Year -1 level of performance from each year's performance and dividing the difference by the year-1 level. Top 3 PE firms are identified based on the total number of buyouts they backed from 1980 to 1997. The p-values reported are based on the Wilcoxon two sample difference test (two tailed).

Year Relative to Completion of IPO		Year -3 to Year -1	Year -2 to Year -1	Year +1 to Year -1	Year +2 to Year -1	Year +3 to Year -1	Year +4 to Year -1	Year +5 to Year -1	3 Year Avg to Year -1	5 Year Avg to Year -1
Panel A: Percentage Change in Cash Flow to Total Assets										
Pre-ind. adjustment:	Top 3 PE-backed	-20.07%	-16.48%	-1.75%	5.11%	-2.94%	-21.05%	-23.77%	-2.18%	-11.46%
	Other PE-backed	-26.18%	-13.97%	-9.56%	-17.49%	-26.49%	-22.97%	-34.55%	-21.80%	-25.98%
	p-value	[0.6971]	[0.3901]	[0.2878]	[0.0173]	[0.0794]	[0.5395]	[0.4972]	[0.0424]	[0.2309]
Post-ind. adjustment:	Top 3 PE-backed	-49.65%	-31.29%	-26.33%	-16.69%	-15.40%	-35.30%	-83.10%	-17.82%	-36.48%
	Other PE-backed	-51.46%	-30.42%	-36.19%	-62.22%	-61.07%	-60.49%	-67.55%	-63.74%	-50.52%
	p-value	[0.4772]	[0.5393]	[0.5557]	[0.0138]	[0.0812]	[0.3187]	[0.7853]	[0.0183]	[0.2653]
Panel B: Percentage Change in Assets Turnover										
Pre-ind. adjustment:	Top 3 PE-backed	-4.69%	-2.32%	-9.57%	-9.76%	-12.02%	-19.04%	-16.98%	-8.99%	-12.76%
	Other PE-backed	-0.98%	-0.88%	-6.71%	-12.74%	-10.59%	-8.70%	-12.41%	-8.48%	-12.49%
	p-value	[0.9809]	[0.3316]	[0.9692]	[0.2401]	[0.9085]	[0.1512]	[0.3284]	[0.7362]	[0.5905]
Post-ind. adjustment:	Top 3 PE-backed	-9.85%	-7.74%	-33.92%	-21.07%	-37.14%	-46.82%	-37.50%	-29.15%	-31.24%
	Other PE-backed	-3.94%	1.36%	-31.54%	-34.13%	-28.06%	-24.53%	-38.80%	-28.99%	-30.34%
	p-value	[0.8633]	[0.2766]	[0.7533]	[0.1401]	[0.9069]	[0.548]	[0.6583]	[0.6556]	[0.747]
Panel C: Percentage Change in Cash Flow to Sales										
Pre-ind. adjustment:	Top 3 PE-backed	-19.01%	-12.59%	6.04%	6.35%	5.32%	-5.38%	-7.81%	5.21%	-3.91%
	Other PE-backed	-20.22%	-12.00%	3.24%	-2.30%	-13.81%	-12.83%	-10.21%	-6.58%	-10.37%
	p-value	[0.8289]	[0.7849]	[0.3678]	[0.2661]	[0.1381]	[0.4224]	[0.914]	[0.2301]	[0.3544]
Post-ind. adjustment:	Top 3 PE-backed	-56.63%	-28.60%	7.30%	-1.68%	8.48%	-10.20%	-48.28%	10.47%	-6.06%
	Other PE-backed	-42.72%	-21.19%	-10.79%	-22.20%	-27.26%	-31.57%	-40.63%	-19.64%	-23.04%
	p-value	[0.2198]	[0.6721]	[0.4209]	[0.7427]	[0.8032]	[0.7154]	[0.6583]	[0.5498]	[0.9192]

Table 9: Median Operating Performance - Buyouts Backed by Young PE Firms vs. Buyouts Backed by Other PE Firms

Cash Flow equals net sales less cost of goods sold and selling, general and administrative expense before depreciation depletion and amortisation. Asset Turnover equals total sales to total assets. Year -1 is the last full financial year immediately before the IPO completion year and Year +1 is the first full financial year immediately after the IPO completion year. 3 Year Avg and 5 Year Avg refer to the mean performance of the first three years and the five years after IPO respectively. Industry performance is computed by using the industry average of the relevant accounting items. industry adjustment is made by subtracting the matched industry performance from the performance of each sample firm. Young PE refer to the PE firms which aged 10 years or younger when they backed our sample buy-outs.

Year Relative to Completion of IPO		Year -3	Year -2	Year -1	Year +1	Year +2	Year +3	Year +4	Year +5	3 Year Avg	5 Year Avg
Panel A: Cash Flow to Total Assets											
Pre-ind. adjustment:	Young PE backed	0.1788	0.1591	0.2217	0.1655	0.1803	0.1742	0.1967	0.1608	0.1667	0.1736
	Other PE backed	0.1630	0.1994	0.2187	0.1898	0.1817	0.1754	0.1641	0.1512	0.1842	0.1817
Post-ind. adjustment:	Young PE backed	0.0269	0.0690	0.0778	0.0140	0.0088	-0.0009	-0.0017	0.0028	-0.0025	-0.0128
	Other PE backed	0.0145	0.0282	0.0609	0.0405	0.0157	0.0325	0.0245	-0.0070	0.0292	0.0254
Observations	Young PE backed	12	15	20	17	18	18	17	16	17	13
	Other PE backed	64	64	70	75	74	70	65	66	66	55
Panel B: Assets Turnover											
Pre-ind. adjustment:	Young PE backed	1.7511	1.7255	1.6556	1.6880	1.6336	1.6470	1.4013	1.4436 ^c	1.7522	1.8219 ^c
	Other PE backed	1.7699	1.6362	1.7633	1.4406	1.5243	1.3928	1.3667	1.3458 ^c	1.6238	1.4751 ^c
Post-ind. adjustment:	Young PE backed	0.4235	0.4582	0.4379	0.4566	0.4088	0.4937	0.2743	0.3657	0.5111	0.4627
	Other PE backed	0.5956	0.5094	0.5522	0.2935	0.3107	0.3741	0.4101	0.2762	0.3781	0.4197
Observations	Young PE backed	14	16	21	21	21	21	19	17	21	17
	Other PE backed	67	67	73	94	94	88	75	72	82	68
Panel C: Cash Flow to Sales											
Pre-ind. adjustment:	Young PE backed	0.0842	0.1274	0.1505	0.1495	0.1197	0.1114	0.0969	0.0880	0.1397	0.0949
	Other PE backed	0.1065	0.1211	0.1490	0.1468	0.1408	0.1359	0.1251	0.1238	0.1366	0.1394
Post-ind. adjustment:	Young PE backed	-0.0168	0.0236	0.0286	-0.0182	-0.0363	-0.0336	-0.0448	-0.0400	-0.0347	-0.0409
	Other PE backed	-0.0243	-0.0094	0.0111	0.0017	-0.0056	-0.0035	-0.0128	-0.0204	-0.0047	-0.0109
Observations	Young PE backed	12	15	20	19	19	19	17	16	19	15
	Other PE backed	67	67	73	76	76	72	67	68	69	57

Table 10: Percentage Change in Operating Performance - Buyouts Backed by Young PE Firms vs. Buyouts Backed by Other PE Firms

Cash Flow equals net sales less cost of goods sold and selling, general and administrative expense before depreciation depletion and amortisation. Asset Turnover equals total sales to total assets. Year -1 is the last full financial year immediately before the IPO completion year and Year +1 is the first full financial year immediately after the IPO completion year. 3 Year Avg and 5 Year Avg refer to the mean performance of the first three years and the five years after IPO respectively. Industry performance is computed by using the industry average of the relevant accounting items. industry adjustment is made by subtracting the matched industry performance from the performance of each sample firm. The % change is computed by subtracting Year -1 level of performance from each year's performance and dividing the difference by the year-1 level. Young PEs refer to the PE firms which aged 10 years or younger when they backed our sample buyouts. The p-values reported are based on the Wilcoxon two sample difference test (two tailed).

Year Relative to Completion of IPO		Year -3 to Year -1	Year -2 to Year -1	Year +1 to Year -1	Year +2 to Year -1	Year +3 to Year -1	Year +4 to Year -1	Year +5 to Year -1	3 Year Avg to Year -1	5 Year Avg to Year -1
Panel A: Percentage Change in Cash Flow to Total Assets										
Pre-ind. adjustment:	Young PE-backed	-20.52%	-5.05%	-11.31%	-23.42%	-16.51%	-30.57%	-27.00%	-25.54%	-19.09%
	Other PE-backed	-23.27%	-16.00%	-0.46%	-5.00%	-8.27%	-19.85%	-34.28%	-10.35%	-15.82%
	p-value	[0.6539]	[0.5419]	[0.2304]	[0.1863]	[0.6228]	[0.4164]	[0.5225]	[0.1845]	[0.6793]
Post-ind. adjustment:	Young PE-backed	-55.19%	-30.42%	-43.07%	-73.04%	-63.32%	-52.16%	-73.64%	-71.53%	-44.99%
	Other PE-backed	-49.65%	-25.51%	-27.87%	-26.15%	-38.74%	-48.35%	-69.10%	-26.30%	-37.03%
	p-value	[0.9539]	[0.8941]	[0.1909]	[0.0739]	[0.2009]	[0.3508]	[0.676]	[0.0861]	[0.2672]
Panel B: Percentage Change in Assets Turnover										
Pre-ind. adjustment:	Young PE-backed	1.12%	-0.35%	-6.71%	-16.93%	-10.42%	-12.52%	-15.52%	-8.48%	-7.18%
	Other PE-backed	-5.48%	-2.63%	-8.61%	-10.37%	-15.20%	-12.00%	-19.04%	-9.85%	-12.76%
	p-value	[0.1197]	[0.2592]	[0.3985]	[0.222]	[0.0932]	[0.2789]	[0.1808]	[0.3162]	[0.3152]
Post-ind. adjustment:	Young PE-backed	-1.71%	1.29%	-8.53%	-18.82%	-10.92%	-30.37%	17.70%	-19.98%	-11.18%
	Other PE-backed	-9.07%	-5.02%	-34.67%	-31.48%	-39.18%	-36.97%	-40.48%	-38.51%	-32.87%
	p-value	[0.8001]	[0.6149]	[0.0215]	[0.128]	[0.016]	[0.3926]	[0.1231]	[0.0393]	[0.0861]
Panel C: Percentage Change in Cash Flow to Sales										
Pre-ind. adjustment:	Young PE-backed	-17.40%	-12.78%	-11.01%	-11.41%	-23.36%	-20.85%	-21.72%	-16.06%	-17.89%
	Other PE-backed	-20.21%	-11.45%	3.49%	5.28%	1.85%	-2.65%	-9.27%	3.37%	-4.21%
	p-value	[0.7961]	[0.8192]	[0.0625]	[0.1762]	[0.0879]	[0.1588]	[0.5095]	[0.0553]	[0.1538]
Post-ind. adjustment:	Young PE-backed	-55.82%	-33.61%	-79.76%	-91.76%	-94.24%	-133.53%	-140.61%	-95.59%	-90.79%
	Other PE-backed	-44.21%	-20.60%	5.79%	-0.90%	12.19%	-13.69%	-39.28%	8.80%	-10.60%
	p-value	[0.6477]	[0.5513]	[0.0101]	[0.0258]	[0.01]	[0.0252]	[0.1069]	[0.013]	[0.0093]

Table 11: Number of Months from Buyout Transaction to IPO

Young PE-backed buyouts refer to buyouts which are backed by PEs aged 10 years or younger.

No. of months to IPO	Young PE-backed buyouts	All Other PE-backed buyouts	All other PE and non-PE-backed buyouts
Median	27.5	34	39
Mean	31.3	43.24	47.55
S.D.	15.38	29.02	32.55
Min	8	4	0
Max	61	114	183
Count	20	101	152

Two-sample Wilcoxon rank-sum test statistics (Two tailed):

Ho: No. of months to IPO (Young PE-backed) = No. of months to IPO (All other PE-backed)

Z value: 1.274

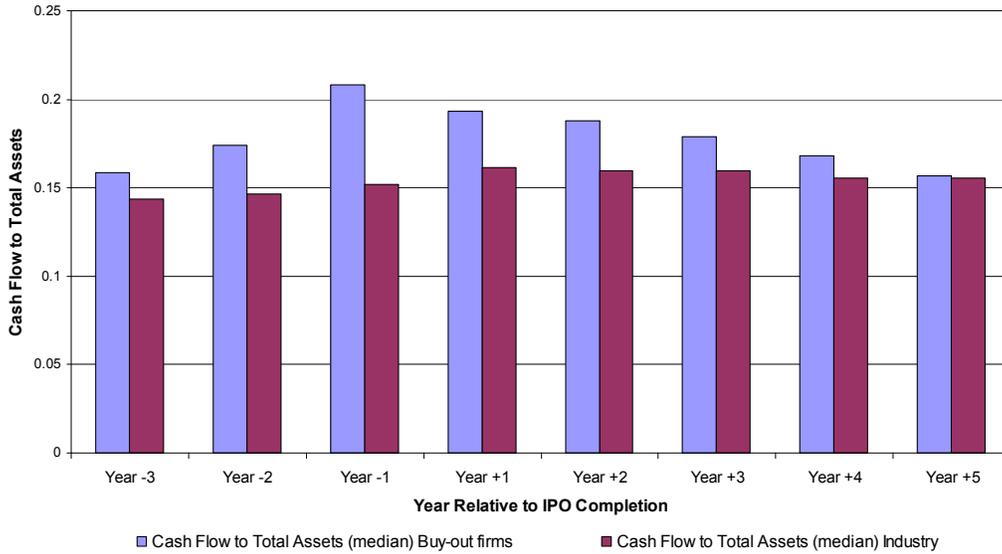
Prob > |z|: 0.2027

Ho: No. of months to IPO (Young PE-backed) = No. of months to IPO (All other sample buyouts)

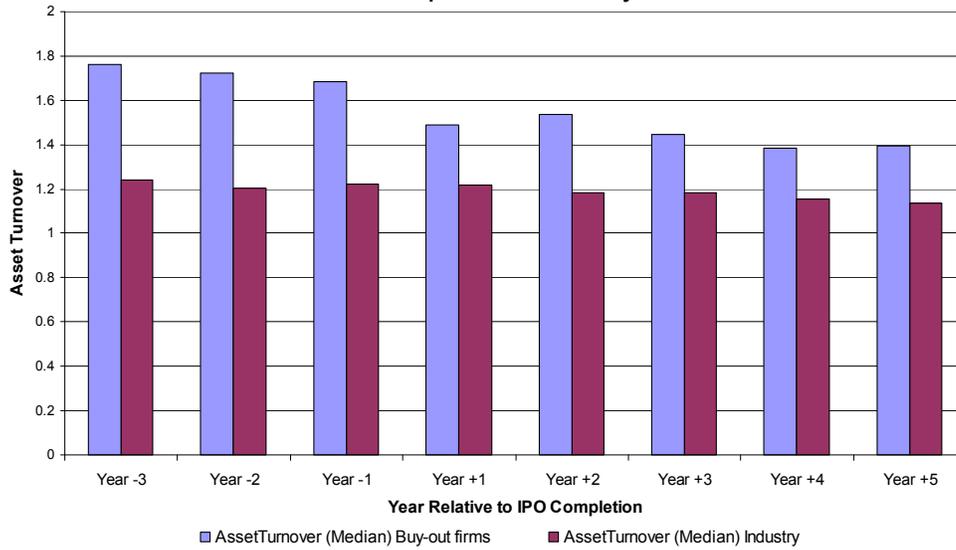
Z value: 1.985

Prob > |z|: 0.0471

**Figure 1: Cash Flow to Total Assets
Sample Firms vs. Industry Average**



**Figure 2: Asset Turnover
Sample Firms vs Industry**



**Figure 3: Cash Flow to Sales
Sample Firms vs. Industry**

