SMBOs: Buying Time or Improving Performance?

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Abstract

This paper examines post-buyout long term abnormal performance of 491 private equity (PE) backed and non-PE backed UK secondary management buyouts (SMBOs), during the period 2000 – 2010. Our univariate analysis of post-SMBO performance shows negatively changes in profitability, efficiency, and growth. We find strong evidence that SMBOs perform worse than primary buyouts in profitability, efficiency, and growth. We find no evidence for superior performance of PE backed SMBOs compared to their non-PE backed counterparts. Our panel data analysis identifies that debt and changing management are important determinants of the post-SMBO performance.

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1. Introduction

A secondary management buyout (SMBO) is a form of buyout where an initial (primary) buyout is acquired by a new set of PE financiers and/or management. CMBOR data demonstrates dramatically increases in UK SMBOs by number and value after 2000 (see Figure 1). The popularity of SMBOs raises important questions regarding the life-cycle, longevity, and the manner in which PE firms realize the gains on their investment.

(Insert Figure 1 Here)

There are two opposite views on post SMBOs' performance. Some authors argue that the value creation mechanisms have already been adopted during first buyouts (Wright et al., 2000). It is, therefore, hard for PE firms to further generate the value. Thus, SMBO transactions could seem as a way to buy more time for IPO and trade sales exits, rather than value creation transactions. In this circumstance, SMBOs may not significantly generate wealth for target companies (Jelic and Wright, 2011). In contrast, others argue that SMBOs can still improve the performance of target companies, because some PE firms from initial rounds may be forced to exit due to the fund expiry (Achleitner and Figge, 2011; Sousa, 2010). Moreover, PE firms may apply different strategies. Second round PE firms try to create value by adopting new or by changing existing practices. In addition, management would only invest in companies with promising prospect, since they possess more internal information than others. Recent emerging research on SMBOs finds mixed evidence on the performance of SMBOs. For instance, according to worldwide data, Achleitner and Figge (2011) present that SMBOs still have operational performance improvements, relative to primary buyouts, while Bonini (2010) does not demonstrate significant improved performance after SMBOs. With regards to UK data, Wang (2010) finds SMBOs perform better in generating cash flows but worse in generating earnings than first buyouts. Also, Jelic and Wright (2011) find a significantly improvement in output and dividends while significant reductions in gearing and profitability in post-SMBO phase.

However, recent research only focuses on operating performance in the first three years after SMBO (Bonini, 2010; Wang, 2010; Achleitner and Figge, 2011) and the long-term operating performance in early 2000s (Jelic and Wright, 2011). Operating performance based on traditional agency theory does not totally describe companies' performance. Growth as a highly recommended measure in strategic entrepreneurship literature complements to operating performance. More specifically, traditional agency theory in buyouts only emphasizes the reduction of costs caused by over-investment and over-diversification, while ignores the strategic entrepreneurship dimension. Strategic entrepreneurship perspective views that, in buyout context, managers and PE firms are strongly motivated to employ their idiosyncratic knowledge, skills, experience, and capabilities to exploit growth opportunities (Wright et al., 2000; Meuleman et al., 2009). Furthermore, previous studies find evidence that value creation mechanisms including: management equity

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stake, actively monitoring, debt bonding, and governance intervention, drive the post buyout performance (Christian and Marc, 2011; Cornelli and Karakas, 2011; Nikoskelainen and Wright, 2007; Guo et al., 2009). The prolongation of buyout structure caused by SMBOs, however, may change the explanation powers of these value creation mechanisms (Wright et al., 2009). The evidence on either the growth of target companies or the determinants (value creation mechanisms) of the performance is scarce. This paper aims to fill this gap to further examine whether SMBOs just buy time or improve the performance of target companies.

Based on a hand-collected dataset of 491 UK SMBOs and their exit statuses and post-SMBO performance during 2000 – 2010, we examine whether the target companies' operating performance and growth obtain improvement after SMBOs. More specifically, we examine the target companies' post-SMBO profitability, efficiency, and growth. We also investigate whether PE backed SMBOs perform better than non-PE backed SMBOs. Secondly, we analyse whether value creation mechanisms associated with PE model and buyouts still have power to explain the changes in performance after SMBOs.

We contribute to the literature by using the more comprehensive SMBO dataset. Second, our study evidences the differences of post buyout performance between SMBOs and primary private-to-private MBOs. Third, we examine companies' growth, which is supported by strategic entrepreneurship theory, as another important aspect that complements to operating performance. Fourth, we offer the evidence on whether typically value creation mechanisms in buyout structure can drive the performance in the second buyout round. Fifth, we contribute to a growing body of studies on the performance improvement of PE backed buyouts, by focusing specially on the different performances of PE-backed and non-PE backed SMBOs.

Our results suggest that the most popular exit rout for our sample SMBOs are: trade sales (82 deals), tertiary management buyout (69 deals), and receivership (41 deals). IPO (12 deals) is the last popular exit route. Large SMBOs and SMBOs with better pre-event performance are more likely to receive PE backing. The distributions of industry also show significantly different between PE baked and non-PE backed SMBOs. Our results also demonstrate a decrease trend in profitability, efficiency, and growth from the first to the fifth post-SMBO year. SMBOs underperform their matched counterparts of primary private-to-private MBOs in profitability, efficiency, and growth. We find no evidence for superior performance of PE backed SMBOs, compared to their non-PE backed counterparts. We show that debt coverage is significantly positive related to the post-SMBO performance in profitability, efficiency, and growth. We also find that changing CEO and/or CFO in the transaction year can improve firms' growth performance. However, we do not find any evidence on the impact of increased management investment in equity.

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The rest of this paper is structured as follows. Section two motivates hypotheses. This is followed by section three that describes data and methodology. Section four presents results of univariate and multivariate analysis. In section five, we check for robustness of our results. Section six is conclusion.

2. Literature

2.1 SMBOs buy time?

SMBOs continue the buyout organization form with a different ownership set. Before SMBOs, the governance mechanisms (management monitoring, PE firm's participation, and leverage) have already existed in the companies (Wright et al., 2009). The effects of these mechanisms would likely only last for 2-3 years after buyout (Wiersema and Liebeskind, 1995). After this period, the performance improvement's speed seems to decline (Jelic and Wright, 2011). Moreover, PE firms will exit when the marginal value added is less than the marginal costs (Cumming and MacIntosh, 2003). This means that when exiting, their skill set is exhausted and the value added cannot be increased. The public offering and trade sale would be the first choices for exiting, as they could enhance the reputation of PE firms (Schwienbacher, 2002). When a public offering and a trade sale are not available, a secondary sale may be one of the few options left. In addition, management investments in the SMBOs are usually greater than primary buyouts (Achleitner and Figge, 2011). Although increased managerial equity shares may lead to more growth opportunities, it may also induce greater entrenchment behaviour. Based on above arguments, SMBOs are not likely to improve the performance of target companies. They are, therefore, just used as means to buy more time before IPO or trade sale exits.

2.2 SMBOs improve performance?

In contrast, there are some arguments that support the performance improvement by SMBOs. With regards to PE firms, in the primary buyout phase, literature evidences that PE-backed companies can obtain greater performance improvement in buyouts, compared to non-PE backed companies (Jain and Kini, 1995; Meuleman et al., 2009). This is because PE firms may monitor the management to eliminate the agency costs and participate in the management of companies they invest (Cressy et al., 2007). Kaplan and Stromberg (2009) also claim that PE firms' strong industry background and operational experience can improve the target companies' performance. However, PE funds have limited life (Stromberg, 2008). When the fund approaches the end of the lifetime, the primary PE firms will be forced to exit from the buyouts. We, therefore, hypothesize that at least some of the funds would come to their end before all potential improvements to portfolio companies are achieved. In addition, there is evidence that some of the PE funds may exit their portfolio companies early to create their track record to enhance their reputation (Sousa, 2010; Harford and Kolasinski, 2010; Stromberg, 2008; Achleitner and Figge, 2011). Similarly, the funds of these cases will exit before the effects of value creation mechanisms are exhausted. In the SMBO phase, the secondary PE firms may possess specific complementary knowledge and skills (Acharya et al., 2010; Sousa,

2010), which may help them to find performance improvement potentials, although the primary PE firms have exhausted all the improvement potentials from their perspectives. For instance, some primary buyout target companies are small private companies, backed by relatively small PE firms (Kitzmann and Schiereck, 2009). When the target companies mature and expand, the small PE firms could not manage them based on their limited experience and human resource. Therefore, it is more optimal to be sponsored by bigger PE firms with more personnel and experience (Wang, 2010). With respect to management, they usually stay on board and purchase some equity in the SMBO (Wright, 2000). Target companies may, therefore, still benefit from the continuing envolement of PE firms and management.

2.3 Determinants of the performance

There are three main types of value creation mechanisms for performance improvements at the enterprises level (Kaplan and Stromberg, 2009): (1) financial engineering, (2) governance engineering, and (3) operational engineering. Financial engineering refers to the tax shield and free cash flow pressure by the use of debt. Kaplan (1989) shows that tax benefits could explain the premiums paid by PE firms to pre-buyouts shareholders. Higher leverage prevents managers from wasting money due to the liability to pay principal money and interests (Kaplan 1989, Kaplan and Stromberg, 2009, Harford and Kolasinski, 2010).

Governance engineering refers to PF firms' monitoring, governance intervention, and incentive alignment. PE firms own a majority of share of the company. They monitor as active members on board to minimize the management inefficiency. The recent study conducted by Christian and Marc (2011) demonstrate that PE firms mainly prefer benevolent activism. This means that PE firms are active and their activities do not harm the target company in long term. Governance intervention is a crucial tool often used by PE firms after investment. They will replace company's executives or call more board meetings (Acharya et al., 2010). Cornelli and Karakas (2011) find a dramatically decrease in board size when company going private. Moreover, buyout investors improve incentive alignment between shareholders and managers by adopting the stock commissions or motivating managers to make a meaningful investment and preventing management from manipulating short-run performance (Jensen, 1989; Kaplan, 1989).

Operational engineering refers to PE experts with operating backgrounds and industrial focus could add value to the target companies. Nowadays, large PE firms tend to recruit professions with various backgrounds (Kaplan and Stromberg, 2009). These experts will use their knowledge to identify the attractive investments for the portfolio and help improve the value creation plans for these investments. In our paper, we focus on financial engineering and governance engineering. More specifically, we choose four typical mechanisms to analysis: managerial equity ownership, debt bonding, PE firms' monitoring, and governance intervention.

3. Data and Methodology

3.1 Data and sample descriptive statistics

We start our data collection from the Centre for Management Buyout Research (CMBOR) database. The original SMBO deal list consists of 612 SMBOs with exit status in UK between 2000 and 2010. These SMBO transactions are completed from 2000 to 2007. We collect exit routes and exit dates by the end of 2010. We also hand collect data on activities, deal values, private equity backing, and capital structure in the transaction year. We end our data of SMBOs at 2007 for the purpose of tracking the performance for long enough periods. We cross check our SMBO list with the list of buyouts in Thomson One Banker. There are 3,243 UK buyout transactions in total during 2000 and 2007 in Thomson One Banker. Thomson One Banker, however, list only 167 SMBO transactions in UK from 2000 to 2007.

Thomson One Banker and Worldscope are two common worldwide databases used in literature due to their reliability and comprehensive data collection for public companies. Specific to our case, however, the majority of target companies are missed in Thomson One Banker and Worldscope, as they are small- and medium-size private companies. Thus, we choose FAME to collect the financial information. We were able to collect financial details up to 10 years, directors and contacts, detailed corporate structures and the corporate family, shareholders, subsidiaries, and industry for 516 sample SMBOs. In addition to the process as discussed above, we exclude SMBOs from financial industry, since their financial reports are different from other industries. We also exclude companies without post SMBO data and one year performance data. Hence, there are 491 SMBOs in our sample (see Table 2).

(Insert Table 2 Here)

Figure 2 presents the distribution of population and sample SMBOs from 2000 to 2010, by entry and exit. This figure demonstrates that although there is a short decrease from 2002 to 2003, the number of entry SMBOs increase dramatically since 2000 forwards, consistent with other worldwide SBO studies (e.g. Sousa, 2010; Bonini, 2010). This figure also demonstrates an increasing trend in the number of exit SMBOs from 2002 to 2007. During 2007 to 2009, the number of exit SMBOs decreases dramatically, due to the worldwide financial crisis.

(Insert Figure 2 Here)

Our sample SMBOs (Table2) shows that among the 491 UK SMBOs, 323 deals are PE-backed, while 168 deals are not. Table 1 suggests that there are only 12 SMBOs exit via IPO which loses its first position in the exit routes, while trade sale (82 deals) are the most popular exit route from SMBO. Tertiary management buyout (69 deals)

is the second popular exit route, followed by receivership (41 deals). Finally, 287 SMBOs are still in SMBOs or unknown, accounting for 58% of the whole sample. Even though our sample filter drops 113 SMBOs deals, the population is not significantly changed.

According to traditional 2-digit SIC code industry classification, our sample SMBOs are classified into 59 separate industries. However, these industries are too narrow to do our following analysis, as the data limitation. Therefore, we adopt the industry classification scheme from Gompers *et al.* (2008) to reclassify our sample into 9 broad industries based on Venture Economics' classification (VEIC). These industries are Internet and Computers, Communications and Electronics, Business and Industrial, Consumer, Energy, Biotech and Healthcare, Financial Service, Business Service, and all others. As a consequence, the 9 industry classes are more in line with the technology and management expertise in venture capital industry. For details, the Business Services includes companies associated with: services, transport, hotel, leisure, paper and packaging, wholesale, and distribution. The Business and Industrial includes companies associated with: manufacturing, construction, engineering, house building, vehicles and sheep building, steel, metals, and non-metals. For other industry classes, we link 3-digit primary US SIC code of our sample companies and VEIC industry group, by using the concordance of VEIC code and US SIC code (Dushnitsky et al., 2009). This procedure identifies the VEIC industry group of US SIC code. Finally, we reclassify our sample into 8 industry classes (excluding Financial Service). When we do not access to SIC code, we assign industries classes in the light of their transaction activities. The results of our sample industry distribution by exit status, exit routes, and PE backing are reported in Table 3.

(Insert Table 3 Here)

Noticeably, Business Services (41%) is the largest industry group in our sample, followed by Consumer (23%) and Business and Industrial (21%). As to exit routes, IPO exit tend to be more popular in Internet and Computers, Communication and Electronics, and Consumer. Tertiary management buyout and receivership exits tend to be more popular in Business Services. Similarly, PE backed SMBOs tend to be more popular in Business Service and Consumer. The industry distribution of SMBOs exited via tertiary management buyout significantly differs from that of SMBOs exited via trade sale. The industry distribution of PE backed SMBOs is significantly different from that of non-PE backed SMBOs.

Deal characteristics are presented in Table 4. We collect information of value for 352 deals, management share percentage after SMBOs for 110 deals, primary buyouts' duration for 165 deals. PE backed SMBOs are approximately twice larger than their non-PE backed counterparts. Moreover, the difference in gear for PE backed and non-PE backed is significant at 1% level. Management shares of the total equity is

46.1% on average (median=39.5%). Non-PE backed SMBOs tend to receive 77.5% more management investment. Debt coverage is 51.173, with a great standard deviation. The average duration for primary buyout is 49.830 month (almost 4 years), consistent with earlier studies in buyout (Stromberg, 2008). However, the average duration of SMBO is 40.574 (near 3 years), shorter than that of primary buyout. There are 276 management buyout or buy in deals, while 127 pure buyouts (without management participation). We miss buyout information for 88 deals. Management buyout or buy in deals are more likely to receive PE backed. There are 135 SMBOs change CEO and/or CFO in the SMBO year.

(Insert Table 4 Here)

3.2 Methodology

3.2.1 Performance measures

The most common profitability measure is return on assets (ROA). Scaling by total asset enables the comparison between companies to be possible. However, ROA measures the profitability of one unit asset. This may create a problem that the changes in total assets in one period will increase or decrease the profitability measure of one unit asset. Return on sales (ROS) does not have this weakness. It improves ROA by measuring the profitability of one unit revenue. Also, it overcomes the historic cost problem. Nevertheless, ROS does not reflect the assets' productivity and could be improved by the marketing strategy changes. Therefore, we employ both measures to test the profitability of companies backed by SMBO.

Though profitability is crucial, it cannot capture all behaviour aspects motivated from agency and strategic entrepreneurship activities. We, hence, employ efficiency (SALEMP) and growth ratios. Following Meuleman et al. (2009), this study adopts sales growth (SALG) and employment growth (EMPG) as the variables for companies' growth. They are two most commonly used indicators in entrepreneurial growth literature (Delmar et al., 2003). Sales growth captures growth in additional revenue creation while employment growth captures the growth in labour resources.

Our expected performance model is based on both 'level' and the 'change' model suggested by Barber and Lyon (1996). 'Level' model uses unadjusted changes as expected performance. 'Change' model uses the industry adjusted median as the benchmark. Industry benchmark is widely used in literature which controls for the omitted variables bias in the level model which only uses the company's prior performance as benchmark. The omitted variables bias could stem from business life cycles, industry technical development, and financial crisis. These factors could enable significant trend changes after event year. The expected performance models are as follows:

$$E(P_{it}) = P_{i,t-k};\qquad\qquad \text{(Equation 1)}$$

$$E(P_{it}) = P_{i,t-k} + \Delta PI_{it};\qquad \text{(Equation 2)}$$

WhereP_{it} denotes the performance of company i in period t. $E(P_{it})$ is the expectation of performance of company i in period t. P_{it-k} is pre-event performance of company i. PI_{it} is defined as the performance of industry control group for company i in period t. ΔPI_{it} is the difference of industry control group's pre-event performance and post-event performance in period t. Equation 1 is 'level' model, while equation 2 is 'change' model.

Earnings may be overstated in the year before event announced (Jain and Kini, 1994). Hence, many studies adopt the median performance in several years before event. In this study, we will employ the median value of three years prior to the event (-1 to -3) to be the pre-event performance. Then, we compare the performance in each year post event with the pre-event performance, up to five years. Hence, the abnormal performance could be calculated as the difference between actual performance and expected performance. The formula is as follows:

$$AP_{it} = P_{it} - E\,(P_{it})\qquad\qquad \text{(Equation 3)}$$

Where, P_{it} is the actual performance of company i in year t; AP_{it} is the abnormal performance for various performance ratios: ROA, ROS, SALEMP, EMPG, and SALG. We will exclude the event year 0. Because this year includes both pre-and post- event operations, it is difficult to distinct this year between pre-event years or post-event years. In our univariate analysis, we test whether the abnormal performance is significantly from the first to the fifth post-event year. As shown in summary results of performance measures (see Table 5), there are outliers in our data. Especially, the maximum value of post-SMBO ROA and the minimum value of post-SMBO ROS are extremely large. Thus, all estimates in our analysis are based on 99% winsorized data, in order to eliminate the influence from outliers. In addition, we employ a Wilcoxon signed-rank test to test whether the median value of abnormal performance in each post-event year equals to zero or not.[1]

3.2.2 Determinants of the performance

Our sample descriptive statistics shows that SMBOs with PE backed tends to different from non-PE backed SMBOs in terms of industry distribution, size, and pre-

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[1] We decide the accounting year closed on and after deal announced date as year 0. For those deals that are announced on the dates after the accounting year closed dates, we treat the following accounting as year 0. For example, the accounting year of the target company for 2000 is from October, 1999 to September, 2000. If a SMBO is announced in January, 2000, we will define the accounting year 2000 as year 0. If the SMBO is announced in October, 2000, we will define the accounting year 2001 as year 0.

event performance. These differences suggest that PE firms may not choose a randomly company to invest. They may do due diligence to choose the good companies which may have more probability to success after SMBOs. Hence, it is important to control for the PE firms' selection when study the effect of governance mechanisms after SMBOs. To address the selection bias, we employ a version of Heckman's two-step estimation procedure similar to the one employed in Jelic and Wright (2011). In the first step, we estimate a probit regression with a PE dummy which equals to 1 if PE-backed and 0 otherwise. This step allows us to estimate the probability of receiving PE backing (LAMBDA), using pooled data. The estimated variable (LAMBDA) will be added as an independent variable to correct the selection bias in the second stage for explaining the post-SMBOs performance. The second stage employs a panel regression via a GLS random-effects procedure with robust standard error and omitted collinear covariates. Our univariate analysis shows a decline trends in post-SMBOS period. Unlike OLS regression, panel regression includes this trend by including data from the entire post period.

According to previous studies, we hypothesise that the choice of PE backing would be associated with size, pre-event performance, and industry. For example, Brau et al. (2003) argues that small companies may not be successfully listed. Stromberg (2008) finds a significant association between size and exit routes. Bienz (2004) highlights that highly profitable companies are easier to go public. Sudarsanam (2005) finds operating performance is one of the determinants of the exit routs. PE firms tend to invest in companies with good performance that means promising prospects. Baya and Chemmanur (2006) argue that industry characteristic could influence on the exit strategy choice. For example, Berger et al. (1999) finds highly fragmented industries like services are more likely to be sold to strategic acquirers. The probit model is as follows:

$$PE_i = \alpha + \beta_1 BSERVICES_i + \beta_2 SIZE_i + \beta_3 PreROA_i + \varepsilon_i \qquad \text{(Equation 4)}$$

Where, PE is a dummy variable equalling to 1 if the SMBOs receives PE backing, and 0 otherwise; BSERVICES denotes a dummy variable which equals to 1 if the SMBOs target company is from Business Service industry, and 0 otherwise. Size indicates the logarithm of SMBO deal's value. PreROA is return on assets in one year before SMBOs.

In the second stage model, we regress the change in performance ratios (AROA, AROS, ASALEMP, AEMPG, and ASALG) with variables for managerial equity ownership (MGTSHAR: management's share in proportion to total equity in the transaction year; GEAR: total liability scaled by total equity), debt bonding (DEBTCOV: the amount of debt divided by EBITDA in one year before SMBO), PE firms' monitoring (PE: a dummy variable equals to 1 if SMBO is backed by PE firms, otherwise equals to 0), and governance intervention (MGTCHAN: a dummy variable equals to 1 if the CEO and/or CFO is replaced in the transaction year, and 0

otherwise). Control variables are companies' size (SIZE: the logarithm of deal value), financial crisis effect (Crisis: a dummy variable equals to 1 if the year experiencing on financial crisis, and 0 otherwise), previous performance (PRE: performance ratios in one year before SMBO), and duration in SMBOs (2nd DURA_all: the logarithm of number of months from the SMBO date to the exit date if the SMBO exit or the number of months from the SMBO date to 31/12/2010 if the SMBO does not exit). Lambda is the fitted probability of receiving PE backing which is estimated from the first stage. The regression model is as follows:

$$Ratios_{it} = \alpha + \beta_1 MGTSHAR_{it} + \beta_2 GEAR_{it} + \beta_3 DEBTCOV_{it} + \beta_4 PE_{it} + \beta_5 MGTCHAN_{it}$$
$$+ \beta_6 SIZE_{it} + \beta_7 Crisis_{it} + \beta_8 PRE_{it} + \beta_9 2nd\ DURA_{all_{it}} + \beta_{10} Lambda_{it} + \varepsilon_{it}$$

(Equation 5)

4. Results

4.1 Univariate analysis

Table 5 reports the preliminary results of various performance measures. Panel A and Panel B report the panel statistics of pre- and post- SMBO performance measures, respectively. Compared the two panels, EMPG and SALG have obviously decrease in mean and median values from pre- to post- SMBO. Especially, the mean value for post-SMBO EMPG is negative, indicating reduce in labour resource. Similarly, mean value ROS decreases after SMBO. By contrast, SALEMP increase slightly in mean and median values after SMBO. ROA has greater increases after SMBO on average. As standard deviation indicates, there are huge differences in the ROA in our sample. This could also be observed from the extremely large maximum value (5415.090) that is caused by the dramatically decrease in total assets. The absolute minimum value of post-SMBO ROS is also extremely large. For this case, we observe a huge of administration expenses. No matter the buyout phases, PE backed SMBOs tend to perform better in profitability and growth, while perform worse in efficiency, related to non-PE backed deals.

(Insert Table 5 Here)

Table 6 presents the median unadjusted and industry adjusted abnormal performance of the total sample up to five years after the SMBO's transaction year. We adopt median value, which is highly recommended in literature. To control for the industry influence, we collect performance data for all UK active and inactive private companies (40,267 companies) and employ the industry classification strategy described above to reclassify these companies.

(Insert Table 6 Here)

Our unadjusted abnormal performance for profitability ratio AROA is significantly negative in each post-SMBO year, consistent with the previous UK SBO studies (Jelic and Wright, 2011; Wang, 2010). When scaled by sales, profitability (AROS) show statistically insignificant increases in the first year after SMBO, then decrease. One explanation is that companies may obtain expansion which causes the increase in non-productive assets, resulting in sales scaled ratios unchanged and assets scaled ratios decrease. The industry adjusted changes also show similar negative and statically significant results, with smaller magnitude. SMBO target companies may underperform their industry peers. Other than these, all ratios show decrease trend during the five years after SMBO.

Consistent with Jelic and Wright (2011), our results show a significant increase in operating efficiency (measured by SALEMP) up to four years after SMBO. However, the positive change tends to decrease till a significantly negative change in the fifth year after SMBO. Moreover, when we control for the industry influence, the positive changes disappear, suggesting that the positive abnormal performance in operating efficiency may be caused by the industry improvement. Similar to the profitability ratios, there are significant reductions in the growth ratios (measured by AEMPG and ASLG). Interestingly, after industry adjusted, sales growth increases in post-SMBO year one, two and four, although the values lose significant. In sum, these results offer evidence that performances reduce after SMBO, expect from unadjusted efficiency.

In order to further investigating the performance after SMBOs, we also employ the private-to-private MBOs without SMBO experience (primary MBOs) as benchmark[2]. We match our sample with primary MBOs based on 8 industries, size (measured by logarithm of median total asset three years before buyouts), and pre-event performance (measured by median ROA three years before buyouts). Since this matching approach concerns on multiple dimensions, we adopt propensity score matching method (PSM) similar to Rosenbaum and Rubin (1983). Traditional matching methods will decrease the specification and power of statistic results when multiple matching dimensions. PSM transfers all matching dimensions into a proxy named propensity score, with reducing the biases generated by traditional matching methods.[3] For PSM, we use logit estimation and one by one nearest matching with replacement. After obtaining 358 matched pairs, we still match calendar year in which the transaction is completed. This procedure results in 51 SMBOs matched with 29 primary MBOs. For those 9 primary MBOs that are matched with multiple SMBOs, we calculate the average of these SMBOs as counterparts.

The results are presented in Table 7. Panel A presents the comparison between full samples of SMBOs (491 deals) and primary buyouts (348 deals). This Panel demonstrates significantly underperformance of SMBOs in profitability, efficiency,

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[2]SMBO could be viewed as a type of private-to-private management buyouts.
[3] Li and Zhao (2005) and Cheng (2003) test both traditional multiple-dimensional matching method and PSM and find that there are abnormal performances under PSM while not under traditional method. Rin et al. (2011) also state that PSM takes advantage for matching on observations.

and growth, in despite of significantly outperformance of SMBOs in one year after buyout in terms of efficiency. Results of comparison between matched samples are reported in Panel B. These results show even worse performance in SMBOs, compared to primary MBOs. Our findings support the evidence obtained above that performances reduce after SMBOs. Especially, compared to matched primary MBOs, the outperformance in terms of efficiency disappears.

(Insert Table 7 Here)

PE backed SMBOs generally outperformance in profitability scaled by sales (AROS) and efficiency for up to two to four years (Table 8). However, the differences are only significant in efficiency. In contrast with Jelic and Wright (2011), our results in AROA demonstrate that PE backed SMBOs significantly underperform their counterparts in year three and four. Our results for growth ratios fluctuate over the five years. Generally, PE backed SMBOs outperform in growth in the first post-SMBO year and underperform in the following two or three years till reversing. Overall, the results provide mixed evidence.

(Insert Table 8 Here)

4.2 Regression results

The results of our first stage regression analysis are reported in Table 9. Size and pre-SMBO performance (PreROA) are positively and significantly associated with PE backing. The industry dummy (BSERVICES) is negatively and significantly associated with PE backing, in contrast with Jelic and Wright (2011) who find an insignificantly positive relationship between them. This may be because the number of SMBOs in Business Service dominates our sample SMBOs (see Table 3).

(Insert Table 9 Here)

Table 10 presents the results of the panel regression. The model's explanatory power measured by R^2 and Wald Chi^2. R^2 varies from 4.65% (model for AROS) to 52.89% (model for SALG). Wald Chi^2 is significant for models for AROA, ASALEMP, AEMPG, and ASALG, suggesting our models are fitted for the data, except from the model for AROS[4]. The Lambda is significant for ASALEMP model and AEMPG model but not significant for others, suggesting that selection bias may be a problem for the formers.

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[4] In our unreported results, we test the GLS model without robust standard errors. The Wald Chi^2 of the model for AROS is significant, and the coefficient on GEAR is significant.

(Insert Table 10 Here)

The regressions in Table 10 do not show that deals with higher management share percentage (MGTSHARE) performance better. The results do not suggest that the more share management invests in, the stronger incentive they will have to improving the performance in our dataset. Gearing (GEAR) is another ratio for managerial equity holding. The more debt required to finance means less shares management will purchase (Nikoskelainen and Wright, 2007). As a consequence, management will have less incentive to improve the performance. Our results demonstrate that companies with greater gearing can decrease the performance significantly in AROA model, providing some evidence of the effect of management alignment in profitability. SMBOs with greater debt coverage (DEBCOV) have better performance in AROA, ASLAEMP and ASALG models, suggesting that debt bonding still have power to improve target companies performance.

PE backed SMBOs do not seem to be associated with the changes in performance. This is some inconsistent with our univariate analysis that shows PE backed SMBOs underperform in profitability (measured by AROA) and outperform in efficiency in the first three years. The difference could be due to the sample selection bias which is not controlled for in the univariate analysis. The coefficients for the management changing (MGTCHAN) are significantly positive in AEMPG and ASALG models, suggesting changing CEO and/or CFO may improve the growth of target companies.

With regard to control variables, we find the coefficient for size is significantly positive for ASALEMP model, while significantly negative for AEMPG model. This indicates that larger companies have better performance in sales efficiency and smaller companies grow faster than large companies. Financial crisis only influence in profitability measured by AROA, suggesting that financial crisis negatively influence the profitability. Our results demonstrate that companies with better pre-event performance in profitability (AROA) and growth (AEMPG and ASALG) have less ability to improve these performances after SMBO.

5. Robustness and further analysis

In this section we conduct some further analysis to examine the robustness of our results. First, we present the results for alternative measurement of profitability. Then, we test the post-SMBO abnormal performance of subsamples in terms of different exit routes.

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5.1 Alternative measurement

In our univariate analysis, we employ EBIT to estimate profitability. This measurement has one drawback that could be obscured by depreciation and amortization. Depreciation and amortization is a popular item which is used as a tool to manage earnings. We, therefore, check the robustness of our profitability results by estimating it as the operating income before depreciation and amortization scaled by total assets (EBITDAA) or sales (EBITDAS). The results are presented in Table 11.

(Insert Table 11 Here)

The results suggest significantly negative changes in both unadjusted and industry adjusted profitability scaled by total assets (AEBITDAA) from the first to the fifth post-SMBO year. When scaled by sales, the changes in the first two years lose significance. Our results show a reducing trend from the first to the fifth post-SMBO year. These results are consistent with our findings with EBIT measurement, except that EBITD yields worse profitability than EBIT. We expect an increase in depreciation and amortization caused by increased in non-productive assets. This is support our explanation about the worse performance of ROA than that of ROS.

5.2 Differences in post SMBO performance by exit routes

If SMBOs do not improve, the SMBOs are unlikely to exit via IPO. In Table 2 we see there are still SMBOs exiting through IPO and trade sales. TMBO is still a second popular exit route. This may imply the existence of selection bias in our analysis. Specialists and managers may sell their shares of more successful companies in IPO or sale these companies to other companies. If this selection bias is present, our sample still includes successful SMBOs. Especially, the IPO and trade sales deals will perform differently to others.

We divide our sample by exit routes and compare their post-SMBO performance. The first group consists of exit and non-exit SMBOs. The comparison results are reported in Panel A in Table 12. There is no significant results support that exited SMBOs outperform non-exited SMBOs. We compare the post-SMBO abnormal performance of SMBOs exited via IPO, trade sales, and receivership with the post-SMBOs abnormal performance of SMBOs exited via TMBO. The results are shown in Panel B. IPO deals perform significantly better than TMBO deals in growth. In despite of insignificant, there is some evidence that IPO deals also have better performance in profitability. Trade sales deals significantly outperform TMBO deals in efficiency. Also there is some evidence that trade sales deals outperform TMBO deals in employment growth, without significant. Receivership deals underperform TMBO deals in all performance in the first post-SMBO year. The results are significant in ROS and sales growth. Surprisingly, after the first year, TMBO deals seem to underperform receiverships.

(Insert Table 12 Here)

6. Conclusion

Using a unique, hand-collected dataset of 491 UK SMBO deals, and their exit statuses and post-SMBO performance of target companies during 2000 and 2010, we investigate whether SMBOs improve the performance of target companies or not. Our univariate analysis of the changes in performance after SMBO finds strong evidence on post-SMBO performance reduction in profitability and growth. As for the efficiency, the unadjusted abnormal performance shows significant improvement after SMBOs. But when controlling for the industry factor, the results demonstrate decreases, suggesting SMBOs target companies underperform their industry peers. Our results also demonstrate a decrease trend in profitability, efficiency, and growth from the first to the fifth post-SMBO year. We compare the post-buyout abnormal performance of our sample with matched primary private-to-private MBOs. We find target companies of SMBOs perform worse than those of primary MBOs in profitability, efficiency, and growth.

We find PE backed SMBOs show significantly underperformance in profitability from the third post-SMBO year, compared with their counterparts. PE backed SMBOs perform better in efficiency in the first three post-SMBO years, followed by subsequent underperformance. Generally, PE backed SMBOs outperform in growth in the first post-SMBO year and underperform in the following two or three years till reversing. In sum, our study shows mixed results for the impact of PE backing.

With respect to the exit routes, we find some evidence that SMBOs exited via IPO and trade sales have better post-SMBO performance than SMBOs exited via tertiary management buyouts. This indicates that better companies still choose to exit through IPO and trade sales. Surprisingly, we find SMBOs exited via tertiary management buyouts seem to performance worse than those exited via receivership after the first post-SMBO year.

Our results show that debt coverage is significantly positive related to the post-SMBO performance in profitability (measured by AROA), efficiency (measured by ASLAEMP), and growth (measured by ASALG). We also find that changing CEO and/or CFO in the transaction year can improve firms' growth performance. However, we do not find any evidence on the impacts of increased management investment in equity and PE backing on changes in performance. Our results may imply that reduced control by PE firms and increased proportion of management share in total equity could create greater entrenchment behaviour by management.

Overall, the reported empirical findings evidence that SMBOs do not improve the target companies' performance. There is no conclusive evidence for the superior performance of PE backed SMBOs compared to non-PE backed SMBOs. However, our results also show that not all value creation mechanisms lose the power to explain the changes in post-SMBO performance.

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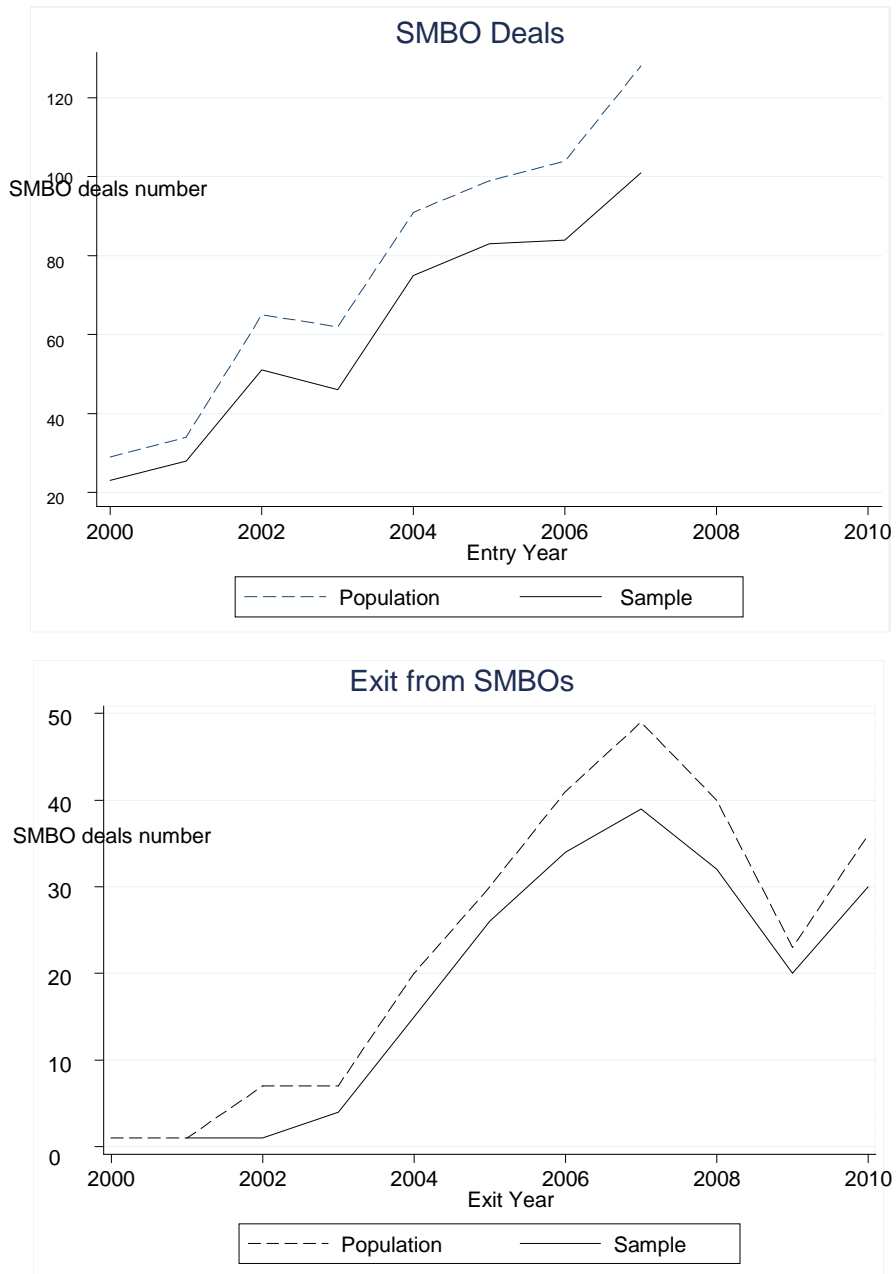
Figure 1: SMBOs by number and value
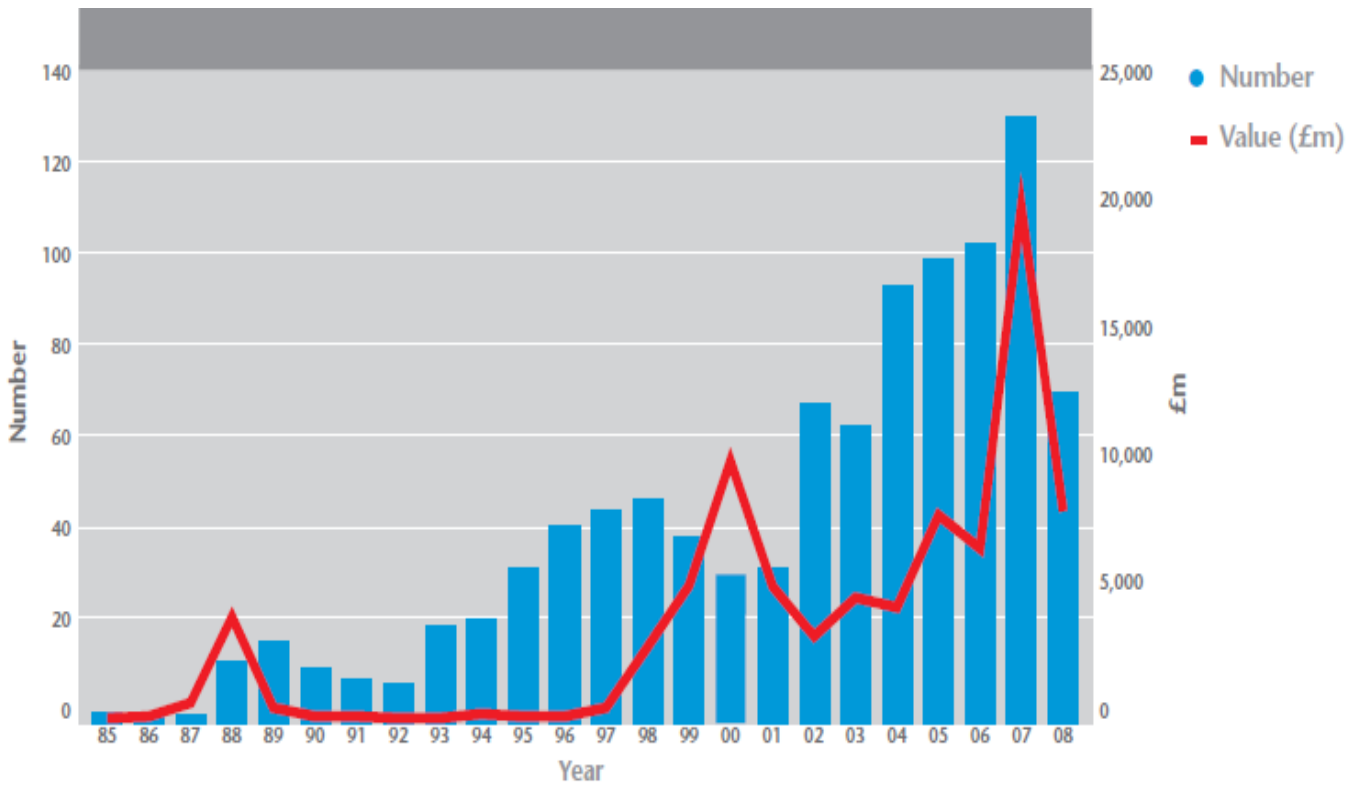
Source: CMBOR/Barclays Private Equity.

Figure 2: Distribution of SMBOs by years

This figure shows the distributions of population and samples of SMBOs by entry and exit years, from 2000 to 2010. Population is from CMBOR database. Sample is the dataset after employing data selection criteria.

Table 1: Definitions of Variables

Description	Variable	Definition	Predicted sign
Performance measurements			
Profitability			
Return on assets	ROA	Earnings before interests and taxes (EBIT) scaled by total assets.	-
Return on sales	ROS	Earnings before interests and taxes (EBIT) scaled by total sales.	-
Efficiency			
Sales efficiency	SALEMP	Inflation adjusted sales scaled by the number of employees.	-
Growth			
Employment growth	EMPG	The difference between the numbers of employee in year t and year t-1 scaled by their average value.	-
Sales growth	SALG	The difference between sales in year t and year t-1 scaled by their average value.	-
Variables for value creation mechanisms			
Managerial equity ownership			
Gearing	GEAR	The sum of long term and shot term debt divided by the total equity.	-
Management share	MGTSHARE	The percentage of target Company's equity contributed by management in the transaction year.	+
Debt bonding			
Debt coverage	DEBTCOV	The amount of all interest bearing debt in the initial capital structure of the SMBO transaction divided by operating income before interests, taxes, depreciation and amortization (EBITDA) in one year before SMBO.	+
PE firms' monitoring			
PE backed	PE	A dummy variable which equals to 1 if SMBO is backed by PE firms and 0 otherwise.	+
Governance intervention			
Management changing	MGTCHAN	A dummy variable which equals to 1 if the CEO and/or CFO is replaced in the transaction year, and 0 otherwise.	+
Control variables			
Companies' size	SIZE	the logarithm of deal value (£ million)	+
Financial crisis effect	Crisis	A dummy variable which equals to 1 if the year experiences on financial crisis and 0 otherwise. The calendar years of 2008, 2009, and 2010 are defined as financial crisis years.	-
Pre-SMBO performance	PRE	The performance ratio (ROA, ROS, SALEMP, EMPG, and SALG, respectively) in one year before SMBO.	-
The longevity of buyout effect	2^{nd}DURA_all	The logarithm of the number of months from the SMBO date to the exit date if the SMBOS exit or the number of months from the SMBO date to the last date (31/12/2010) if the SMBO does not exit.	-

Table 2: Sample SMBOs

This table presents sample SMBOs by private equity backing and by exit status, from 2000 to 2010. Population is the number of UK SMBOs prior to applying any data selection criteria. Sample is the number after employing data selection criteria. Exit routes are: initial public offering (IPO), tertiary management buyout (TMBO), Trade sale (Sale), and receivership (Recei.).

	Population	Sample
Total number of SMBOs	612	491
PE backed	396	323
Non-PE backed	216	168
Numbers of Exits from SMBO	254	204
IPO	12	12
TMBO	83	69
Sale	95	82
Recei.	64	41
Still in SMBO by 31/12/2010	358	287

Table 3: Sample by industry

This table shows industry distribution of SMBOs by exit status, exit routs, and PE backing. Exit routes are: initial public offering (IPO), tertiary management buyout (TMBO), Trade sale (Sale), and receivership (Recei.). Non-exit is defined as the SMBO which does not exit by 31/12/ 2010. Reported figures are proportion of SMBOs in industry groups. Reported P values are two samples Kolmogorov Smirnov (K-S) test for difference in industry distributions across exit status and PE baking. Industry grouping is based on Gompers et al. (2008).

Industry (%):	Exit status				Non-exit	PE backing		Total sample
	Exit					PE	Non-PE	
	IPO	TMBO	Sale	Recei.				
1. Internet &Computers	8	3	4	2	3	3	4	3
2. Communications & Electronics	17	0	6	5	3	4	4	4
3. Business & Industrial	17	13	23	22	22	17	27	21
4. Consumer	33	25	29	20	22	27	16	23
5. Energy	0	1	0	0	2	2	1	1
6. Biotech and Healthcare	8	9	7	0	2	6	1	4
7. Business Services	17	46	26	51	44	45	39	41
8. All other	0	3	4	0	2	3	2	2
Total sample	2	14	17	8	58	66	34	100

	IPO vs. TMBO	IPO vs. Sale	IPO vs. Recei.	TMBO vs. Sale	TMBO vs. Recei.	Sale vs. Recei.	Exit vs. Non-exit	PE vs. Non-PE
K-S test P value	0.109	0.939	0.139	0.042	0.68	0.109	0.787	0.071

Table 4: Descriptive statistics of deal characteristics

This table presents results for deal characteristics. Gearing (GEAR) is estimated as the sum of long term and shot term debt divided by the total equity; Size (SIZE) indicates the logarithm of deal value; Management share (MGTSHARE) indicates the percentage of target Company's equity contributed by management in the transaction year; Debt coverage (DEBTCOV) is computed as total debt in SMBO year divided by earnings before interest, tax, and depreciation and amortization in one year before SMBO; 1st Duration (1st DURA) indicates the number of months from the primary buyout date to the SMBO date; 2nd DURA denotes the number of months from the SMBO date to the exit date; 2nd DURA_all denotes the number of months from the SMBO date to the exit date if the SMBO exit or the number of months from the SMBO date to the last date (31/12/2010) if the SMBO does not exit; MBO:MBI means SMBO is management buyout or buy-in; Pure SMBO means the SMBO is not management buyout or buy-in; MGTCHAN denotes that there is CEO and/or CFO changed in the buyout year. Values for the last four variables are the number of observations and the proportion of observations by PE backing. P-values are from Wilcoxon ran-sum (Mann Whitney) test for differences between PE backing and non-PE backing of size, gear, management share, and holding periods. P-values for MBO: MBI vs. Pure SMBO and MGTCHAN vs. nonMGTCHAN are from two sample proportion test.

		Full sample			PE backing(median)		
	N	mean	median	S.D.	PE	non-PE	P-Value
SIZE	352	1.447	1.495	0.726	1.658	0.740	0.007
GEAR	1146	1.551	0.780	2.093	0.824	0.670	0.000
MGTSHARE	110	0.461	0.395	0.256	0.175	0.950	0.000
DEBTCOV	141	51.173	5.069	521.167	5.132	3.626	0.141
1st DURA	165	49.830	45.000	28.697	44.000	48.500	0.564
2nd DURA	204	40.574	37.500	20.465	38.000	37.000	0.548
2nd DURA_all	490	56.637	54.000	26.212	50.000	63.000	0.000
MBO: MBI	276				64.86%	35.14%	
Pure SBO	127				27.27%	72.73%	
MBO vs. Pure.							0.000
MGTCHAN	135				70.37%	29.63%	
nonMGTCHAN	318				64.15%	35.85%	
MGTCHAN vs. nonMGTCHAN							0.201

Table 5: Summary results of performance measures

This table presents summary results of various performance measures and their results by PE backing. Panel A and Panel B report results for performance measures before SMBO (3 years) and after SMBO (5 years), respectively. Values reported in the column of N are the number of observations of SMBO for different performance measures. The performance measures are: (1) Profitability ratios: return on assets (ROA) and return on sales (ROS). Where, ROA is operating income divided by total assets at the end of the year; ROS is operating income divided by sales; (2) Efficiency ratio: SALEMP, which is estimated as logarithm of inflation adjusted sales in year t scaled by the number of employees in year t; (3) Growth ratios: employment growth (EMPG) and sales growth (SALG). Where, EMPG is the difference between the numbers of employee in year t and year t-1 scaled by their average number; SALG is the difference between sales in year t and year t-1 scaled by their average number. P-values are from Wilcoxon ran-sum (Mann Whitney) test for differences in PE backing and non-PE backing of performance measures

| | Full sample | | | | | | PE backing(median) | | |
	N	Min.	mean	median	Max.	S.D.	PE	non-PE	P-Value
Panel A: Pre-SMBO									
ROA	981	-3.479	0.084	0.077	0.715	0.182	0.088	0.060	0.000
ROS	899	-7.721	0.041	0.056	1.000	0.334	0.072	0.032	0.000
SALEMP	917	0.999	2.134	2.071	5.206	0.490	2.039	2.138	0.000
EMPG	671	-1.990	0.029	0.026	1.775	0.266	0.037	0.004	0.001
SALG	654	-1.992	0.102	0.076	1.969	0.339	0.088	0.037	0.000
Panel B: Post-SMBO									
ROA	1199	-12.134	4.549	0.067	5415.090	156.385	0.064	0.067	0.301
ROS	1009	-279.270	-0.522	0.054	1.000	10.077	0.068	0.042	0.000
SALEMP	880	-1.430	2.164	2.102	5.392	0.543	2.068	2.198	0.000
EMPG	1052	-1.982	-0.010	0.010	1.529	0.277	0.021	0.000	0.000
SALG	947	-1.988	0.044	0.047	1.979	0.337	0.060	0.018	0.000

Table 6: Summary results for the post-SMBO abnormal performance, 2000-2010

This table presents abnormal performance measures for full sample, up to five post-SMBO years (Y 1-5). Abnormal performance (AP_{it}) estimated as: $AP_{it} = P_{it} - E(P_{it})$. where, P_{it} is the actual performance ratio during post-event period and $E(P_{it})$ is expected performance of the target company in the SMBO during post-event period. It is estimated by two models: $E(P_{it}) = P_{i,t-k}$, and $E(P_{it}) = P_{i,t-k} + \Delta PI_{it}$; where $P_{i,t-k}$ is median performance for 3 years prior to the event. ΔPI_{it} is the difference of industry control group's pre-event performance and post-event performance in period t. Median values for AP_{it} are presented for the following performance measures: (1) Profitability ratios: return on assets (ROA) and return on sales (ROS). Where, ROA is operating income divided by total assets at the end of the year; ROS is operating income divided by sales; (2) Efficiency ratio: SALEMP, which is estimated as logarithm of inflation adjusted sales in year t scaled by the number of employees in year t; (3) Growth ratios: employment growth (EMPG) and sales growth (SALG). Where, EMPG is the difference between the numbers of employee in year t and year t-1 scaled by their average number; SALG is the difference between sales in year t and year t-1 scaled by their average number. All results are used 99% winsorized data. We employ the Wilcoxon signed rank test for the median=0, vs. median≠0 to test the significance of abnormal performance. ***, **, *, indicate significance at the 1, 5, and 10 percent level, respectively.

(# observations; # positive observations)		YI	Y2	Y3	Y4	Y5
Profitability ratios						
AROA	Unadjusted	-0.008**	-0.016***	-0.030***	-0.036***	-0.047**
	median	(294:137)	(255:101)	(191:69)	(151:52)	(103:36)
	Industry	-0.002	-0.024***	-0.042***	-0.041***	-0.062***
	adjusted	(230:113)	(197:79)	(141:51)	(83:29)	(47:14)
AROS	Unadjusted	0.008	-0.001	-0.004	-0.014**	-0.017**
	median	(236:128)	(204:101)	(153:84)	(123:50)	(91:31)
	Industry	0.008	-0.003	-0.011**	-0.008	-0.025*
	adjusted	(184:101)	(161:78)	(116:46)	(67:30)	(42:16)
Efficiency						
ASALEMP	Unadjusted	0.038***	0.030***	0.025***	0.022	-0.023***
	median	(234:159)	(199:128)	(146:88)	(125:73)	(82:35)
	Industry	-0.027***	-0.040***	-0.067***	-0.072***	-0.096**
	adjusted	(175:61)	(148:51)	(108:30)	(67:19)	(30:7)
Growth ratios						
AEMPG	Unadjusted	-0.004	-0.022**	-0.039***	-0.038**	-0.056**
	median	(226:110)	(191:77)	(144:55)	(83:28)	(48:15)
	Industry	-0.015	-0.028**	-0.039***	-0.063**	-0.006
	adjusted	(167:76)	(142:61)	(101:30)	(54:20)	(24:11)
ASALG	Unadjusted	-0.016*	-0.046***	-0.050***	-0.098***	-0.126***
	median	(204:94)	(177:74)	(132:50)	(73:21)	(47:11)
	Industry	0.021	0.003	-0.026	0.003	-0.041
	adjusted	(171:93)	(151:77)	(109:50)	(59:31)	(36:16)

Table 7: Differences in post buy-out abnormal performance between SMBOs and primary MBOs

This table presents the difference in median abnormal performance measures for SMBOs and primary private-to-private MBOs, up to five years after SMBO. Differences are estimated as abnormal performance of SMBOs in year t minus abnormal performance of primary private-to-private MBOs in year t. Panel A shows the differences in full samples. Panel B shows the differences in matched samples. Matching is based on industry, size, pre-buyout performance, and buyout year, with using propensity score match method. All results are used 99% winsorized data. We employ the Wilcoxon ran-sum (Mann Whitney) test to test the equality of abnormal performance from the two samples. ***, **, *, indicate significance at the 1, 5, and 10 percent level, respectively.

	YI	Y2	Y3	Y4	Y5
Panel A: Full sample					
Profitability ratios					
AROA	-0.049***	-0.053***	-0.059***	-0.134***	-0.041
AROS	-0.002	-0.008*	-0.011***	-0.020***	-0.022**
Efficiency					
ASALEMP	0.020**	-0.008	-0.007	0.027*	-0.057***
Growth ratios					
AEMPG	-0.017	-0.004	-0.039***	-0.020	-0.050
ASALG	-0.021	-0.061**	-0.067***	-0.067*	-0.155***
Number of SMBOs			491		
Number of primary MBOs			348		
Panel B: Matched sample (based on industry, size, pre-performance, and buyout year)					
Profitability ratios					
AROA	-0.068**	-0.031	-0.165***	-0.133***	-0.031
AROS	-0.007	-0.009	-0.036**	-0.057**	-0.074*
Efficiency					
ASALEMP	-0.099***	-0.033	-0.097***	-0.101**	-0.128**
Growth ratios					
AEMPG	0.016	-0.037	-0.064**	-0.051	-0.036
ASALG	-0.119*	-0.070	-0.093**	-0.097	-0.238
Number of SMBOs			51		
Number of primary MBOs			29		

Table 8: Differences in post SMBO abnormal performance by PE backing

This table presents P-values of Wilcoxon ran-sum (Mann Whitney) test for differences in median abnormal performance measures for PE-backed SMBOs and non-PE-backed SMBOs, up to five years after SMBOs. '>' indicates PE-backed SMBOs outperform non-PE-backed SMBOs; '<' indicates PE-backed SMBOs underperform non-PE-backed SMBOs.

		YI	Y2	Y3	Y4	Y5
Profitability ratios						
AROA	Unadjusted median	<0.365	<0.104	**<0.022**	<0.115	**<0.000**
	Industry adjusted	<0.123	<0.184	**<0.037**	<0.166	< 0.115
AROS	Unadjusted median	>0.633	>0.596	>0.294	>0.468	**<0.011**
	Industry adjusted	>0.756	> 0.286	<0.497	>0.548	<0.386
Efficiency						
ASALEMP	Unadjusted median	**>0.029**	>0.123	>0.309	<0.736	**<0.000**
	Industry adjusted	>0.128	**> 0.078**	>0.134	< 0.242	<0.267
Growth ratios						
AEMPG	Unadjusted median	>0.185	<0.973	<0.271	>0.970	>0.635
	Industry adjusted	>0.271	>0.744	< 0.416	<0.712	**>0.061**
ASALG	Unadjusted median	>0.294	<0.232	<0.329	<0.129	<0.533
	Industry adjusted	> 0.842	<0.543	< 0.353	**< 0.092**	> 0.849

Table 9: Determinants of PE backing

This table shows the results of pooled profit model with robust variance estimate for the profitability of receiving PE backing by the sample SMBOs. Dependent variable: PE (a dummy variable equalling to 1 if the SMBO receive PE backing and 0 otherwise). Independent variables: BSERVICES (a dummy variable which equals to 1 if the SMBO target company is from Business Service industry, and 0 otherwise), SIZE (the logarithm of SMBO deal's value), PreROA (the value of return on assets in one year before SMBO). This model converged after three iterations. P-values for the Wald test ($Wald\ Chi^2$) is for profitability $> Chi^2$. N is the number of pooled sample SMBOs used for the estimation, from the first to the fifth post-SMBO year. ***, **,* are significance at the 1, 5, and 10 percent level, respectively.

Independent variables	Coefficient
BSERVICES	-0.211**
SIZE	0.903***
PreROA	1.106***
Intercept	-0.505***
Log likelihood	-590.497
Pseudo R^2 (%)	16.88
$Wald\ Chi^2$	149.76***
N	1295

Table 10: Value creation mechanisms in post SMBO abnormal performance

This table reports the results of panel regression for the influence of governance mechanisms on post SMBO abnormal performance, up to five years after SMBO. Abnormal performance ratios (dependent variables) are: Abnormal return on assets (AROA); abnormal return on sales (AROS); abnormal sale efficiency (ASALEMP); abnormal employment growth (AEMPG); abnormal sales growth (ASALG). Value creation mechanisms variables are: MGTSHAR: management's share in proportion to total equity in the transaction year; GEAR: the sum of long term and shot term debt divided by the total equity; DEBCOV is computed as total debt in SMBO year divided by earnings before interest and tax one year before SMBO; PE equals to 1 if the SMBO is backed by private equity companies, 0 if others; MGTCHAN denotes that there are CEO and/or CFO changed in the buyout year. Control variables are: SIZE indicates the logarithm of deal value; Crisis equals to 1 if the year has financial crisis, 0 if others; 2nd DURA_all: the logarithm of number of months from the SMBO date to the exit date if the SMBO exit or the number of months from the SMBO date to the last dates (31/12/2010) if the SMBO does not exit; PRE denotes performance (ROA, ROS, SALEMP, EMPG, or SALG) one year before SMBO. Lambda is the fitted probability of receiving PE backing which is estimated from the first stage. The results are based on 1% winsorized data. All parameters are estimated by a GLS random-effects model with robust standard error and omitted collinear covariates. P-values for the Wald test (Wald Chi^2) is for profitability $> \text{Chi}^2$. N is number of observations used for the estimation, from the first to the fifth post-SMBOS year. ***, **,* are significance at the 1%, 5%, and 10% level, respectively.

	AROA	AROS	ASALEMP	AEMPG	ASALG
MGTSHARE	0.159	-1.781	-0.213	0.060	-0.072
GEAR	-0.017*	0.091	0.006	0.018	-0.005
DEBCOV	0.002***	-0.003	0.007***	0.002	0.012***
PE	0.005	-1.088	-0.286	0.123	-0.199
MGTCHAN	-0.014	0.078	0.011	0.124**	0.355**
SIZE	-0.084	1.296	0.708*	-0.370*	-0.189
Crisis	-0.033*	0.003	-0.005	-0.047	-0.091
2nd DURA_all	-0.031	0.523	-0.174	0.133	-0.177
PRE	-1.046***	-4.441	0.053	-0.790***	-0.963***
Lambda	0.109	-1.428	-0.810*	0.402*	0.201
INTERCEPT	0.152	0.477	0.254	-0.258	0.616
Wald Chi^2	33.80***	7.30	198.21***	995.85***	219.63***
R^2 (%)	25.830	4.65	22.38	39.90	52.89
N	147	124	108	104	101

Table 11: Abnormal profitability performance based on EBITDA

This table presents the results of abnormal performance in profitability based on operating income before depreciation and amortization (EBITDA). Abnormal performance (AP_{it}) estimated as: $AP_{it} = P_{it} - E(P_{it})$, where, P_{it} is the actual performance ratio during post-event period and $E(P_{it})$ is expected performance of the target company in the SMBO during post-event period. $E(P_{it}) = P_{i,t-k}$, and $E(P_{it}) = P_{i,t-k} + \Delta PI_{it}$, where $P_{i,t-k}$ is median performance for 3 years prior to the event. ΔPI_{it} is the difference of industry control group's pre-event performance and post-event performance in period t. EBITDAA is EBITDA divided by total assets at the end of the year; EBITDAS is EBITDA divided by sales. All results are used 99% winsorized data. We employ the Wilcoxon signed rank test for the median=0, vs. median≠0 to test the significance of abnormal performance. ***, **, *, indicate significance at the 1, 5, and 10 percent level, respectively.

(# observations; # positive observations)		YI	Y2	Y3	Y4	Y5
AEBITDAA	Unadjusted	-0.020***	-0.027***	-0.035***	-0.048***	-0.058***
		(294:121)	(255:97)	(191:66)	(151:46)	(103:31)
	Industry adjusted	-0.016***	-0.036***	-0.057***	-0.048***	-0.089***
		(230:102)	(197:73)	(141:43)	(83:23)	(47:12)
AEBITDAS	Unadjusted	0.0041	-0.005	-0.006**	-0.019***	-0.027***
		(236:128)	(204:94)	(153:64)	(123:42)	(91:28)
	Industry adjusted	0.004	-0.008	-0.013***	-0.019	-0.031**
		(184:98)	(161:71)	(116:45)	(67:28)	(42:14)

Table 12: Differences in post SMBO abnormal performance by exit routes

This table presents P-values of Wilcoxon ran-sum (Mann Whitney) test for differences in median abnormal performance measures in the light of exit types, up to five years after SMBOs. Panel A shows comparison between exit SMBOs and non-exit SMBOs. '>' indicates exit SMBOs outperform non-exit SMBOs; '<' indicates exit SMBOs underperform non-exit SMBOs. Panel B shows comparison among exit SMBOs through tertiary management buyouts (TMBOs) and exit SMBOs through IPO, trade sale, and receivership, respectively. '>' indicates exit SMBOs through TMBOs outperform other exit types; '<' indicates exit SMBOs through TMBOs underperform other exit types. N.A. means the data is not applicable in the post SMBO years.

Panel A: Exit vs. Non-exit SMBOs performance in post-SMBO years					
	YI	Y2	Y3	Y4	Y5
AROA	<0.607	<0.446	<0.818	>0.445	<0.608
AROS	<0.492	>0.875	<0.469	<0.932	<0.485
ASALEMP	<0.379	<0.645	<0.641	>0.528	>0.628
AEMPG	<0.912	<0.991	>0.177	>0.626	<0.903
ASALG	>0.107	>0.870	>0.540	<0.747	<0.135
Panel B: performance in post-SMBOS years, grouped by exit routes					
	YI	Y2	Y3	Y4	Y5
TMBO vs. IPO					
AROA	<0.788	<0.472	>0.828	<0.643	n.a.
AROS	>0.883	<0.697	<1.000	<0.885	n.a.
ASALEMP	>0.453	>0.688	<0.588	n.a.	n.a.
AEMPG	**<0.078**	**<0.095**	n.a.	n.a.	n.a.
ASALG	<0.687	**<0.096**	n.a.	n.a.	n.a.
TMBO vs. Trade sales					
AROA	<0.451	>0.733	>0.191	<0.622	<0.317
AROS	<0.778	>0.671	**>0.059**	>0.621	<0.423
ASALEMP	**<0.017**	<0.106	**<0.054**	**<0.050**	>0.394
AEMPG	<0.709	<0.235	<0.803	<0.308	<0.165
ASALG	>0.592	<0.936	>0.548	>0.571	<0.157
TMBO vs. Receivership					
AROA	>0.194	<0.628	<0.263	<0.022	<0.116
AROS	**>0.083**	>0.663	>0.779	<0.712	<0.514
ASALEMP	>0.851	>0.517	>0.617	<0.762	>0.348
AEMPG	>0.231	>0.580	<0.780	>1.000	>0.559
ASALG	**>0.017**	<0.477	<0.896	<0.486	<1.000