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SMBOs: Buying Time or Improving Performance?

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On the basis of an empirical analysis of 491 UK recent secondary management buyouts (SMBOs), we find strong evidence of a deterioration in long-run abnormal returns following SMBO deals. SMBOs also perform worse than primary buyouts in terms of profitability, labor productivity, and growth. We find no evidence for superior performance of private equity (PE) backed SMBOs, compared with their non-PE-backed counterparts. It appears that a PE firm's reputation and change in management are important determinants of improvements in profitability and labor productivity, respectively. High debt and high percentage of management equity tend to be associated with poor performance measured by profitability and labor productivity. Notably, none of the buyout mechanisms (i.e., financial, governance, operating) normally associated with performance improvements generate growth during the secondary buyout phase. The results are robust to the use of alternative performance measures, alternative benchmarks, and the possibility of sample selection bias. Copyright © 2013 The Authors. *Managerial and Decision Economics* published by John Wiley & Sons, Ltd.

1. INTRODUCTION

A leveraged buyout involves a form of takeover in which private equity (PE) investors, and often a company's management team, pool their own money (together with debt finance) to buy shares in that company from its current owners to create a new independent entity with a new typically highly leveraged financing structure (Gilligan and Wright, 2012). Prior to the buyout, the company may have been listed on a stock market, a division of a larger corporate or a privately held/family firm. An aspect of the considerable debate about PE concerns the longevity of the buyout governance structure. Jensen (1989) and Kaplan (1991) have suggested that buyouts represent a new long-term form, whereas others have been more circumspect (Rapppaport, 1990) or suggest that it is more heterogeneous (Wright *et al.*, 1994).

Private equity firms typically seek an exit after an average of 5–6 years, either by taking the company public through an initial public offering (IPO) or via a strategic sale to another corporation (Kaplan and Stromberg, 2009; Wright *et al.*, 2010). A buyout governance structure may continue in the form of a secondary management buyout (SMBO). An SMBO is a buyout of a buyout in which the initial (primary) buyout is acquired by a new set of PE financiers and/or management, together with new borrowings. Over the past decade, the number of UK SMBOs has been increasing, while numbers of non-SMBO buyouts have been decreasing (Figure 1, panel A). Recent years have also seen an increase in SMBOs average size and the number of exits from SMBOs (Figure 1, panel B).[1] The aforementioned

Panel B: Exits from SMBOs by years
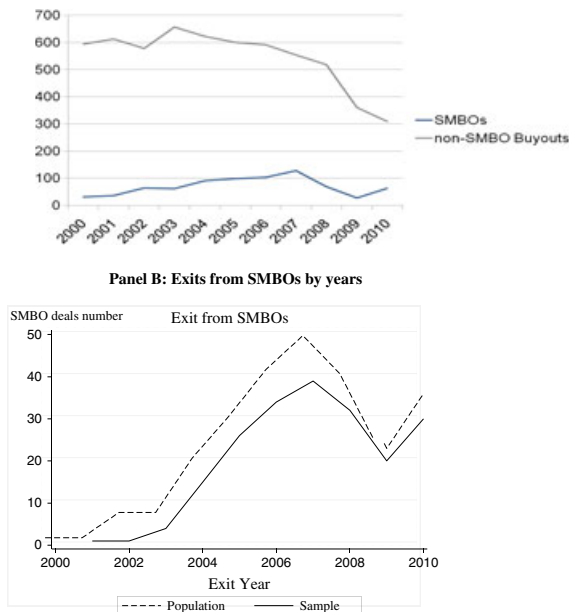
Source: CMBOR/Ernst&Young/Equistone European Partners

Figure 1. UK buyouts in the last decade.

trends resulted in SMBOs' share of total UK deal value increase from 4.6% (in 2000) to 45% (in 2010). The popularity of SMBOs thus raises the opportunity to examine important questions regarding the life cycle, longevity, and the sustainability of gains on PE investments that have implications for both research and practice.

There are two contrasting views on post-SMBO performance. Some argue that value creation mechanisms have already been adopted during first buyouts (Wright *et al.*, 2000a). It is, therefore, hard for PE firms to generate further value. Thus, SMBO transactions could be a way to buy more time for IPO or trade sale exits, rather than an organization structure facilitating new value creation. In this scenario, SMBOs may not generate significant 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 may exit (primary) buyouts before fully achieving all improvements. For example, an 'early' exit could be due to the end of a PE fund's life (Sousa, 2010; Achleitner and Figge, 2012) or because a PE firm attempts to enhance its reputation by creating a track record (Stromberg, 2008; Harford and Kolasinski, 2010). Incoming PE firms may also apply new strategies or change practices adopted by original backers as agency issues have been largely addressed in the first buyout.

Emerging research finds mixed evidence on the performance of SMBOs. For instance, according to worldwide data, Achleitner and Figge (2012) showed

that SMBOs still yield operational performance improvements, relative to primary buyouts. Bonini (2012), however, did not find a significant improved performance of European SMBOs. Wang (2012) reported that UK SMBOs perform better in generating cash flows but worse in generating earnings than primary buyouts. Jelic and Wright (2011) similarly find a significant improvement in output and dividends, accompanied by significant reductions in gearing and profitability for the UK SMBOs. The previous studies focus on operating performance in the first 3 years after SMBO (Achleitner and Figge, 2012; Bonini, 2012; Wang, 2012) and long-term operating performance in the early 2000s (Jelic and Wright, 2011).

We had collected data for 491 UK SMBOs during 2000–2010. The data used in this study are novel and absent from other studies. For example, we incorporate data on both PE-backed and non-PE-backed SMBOs, pre-SMBO and post-SMBO performance (up to 3 years before and 5 years after SMBO), longevity of SMBOs, exit status, and exit routes from SMBOs, and cover the current recessionary period. By using this more comprehensive dataset, we contribute to the literature in several ways. Specifically, we first complement the traditional agency perspective with a strategic entrepreneurship perspective, which may be especially relevant in buyouts of companies that have already experienced the introduction of agency cost-reducing governance mechanisms. Second, we offer insights into whether and to what extent the typical value creation mechanisms in primary buyout structures can also drive performance in the second buyout round. Third, we provide evidence on the differences in post-buyout performance between SMBOs and primary private-to-private buyouts. Fourth, we examine the specific role of PE by comparing the performance of PE-backed and non-PE-backed SMBOs and by examining reputation of PE firms. As such, we add to literature that has identified the importance of PE firm reputation in primary buyouts by showing that it is also important in SMBOs. Fifth, we examine the importance of changing senior executives and increasing managerial equity for the performance. Finally, given the recent policy debate regarding 'short-termism' of UK equity market (Kay, 2012), we provide insights into a longer-term impact of PE in SMBOs than previous studies.

We find lower profitability, labor productivity, and growth from the first to fifth post-SMBO years. SMBOs underperform their matched counterparts of primary private-to-private buyouts in profitability, labor productivity, and growth. Although PE backing (alone) does not seem to drive changes in the performance, PE firms' reputation is an important determinant of the

performance. Other important determinants of the performance are debt coverage, gearing and replacements of management. Our results suggest that the most popular exit routes from our sample SMBOs are trade sales (40%) and tertiary management buyouts (TMBOs) (34%), followed by receivership (20%) and IPOs (6%). Overall, our results are in line with evidence that better-performing companies tend to exit via IPOs and trade sales and that subsequent buyouts (i.e., SMBO and TMBO) tend to be used to buy more time before trade sale and IPO exits.

The remainder of the paper is organized as follows. Section 2 motivates hypotheses. This is followed by Section 3 that describes data and methodology. Section 4 presents results of univariate and multivariate analysis. In Section 5, we analyze the robustness of our results. Section 6 is conclusion.

2. PREVIOUS LITERATURE

2.1. Determinants of Performance

The main mechanisms for performance improvements in buyouts are (i) operational engineering, (ii) financial engineering, and (iii) governance engineering (Kaplan and Stromberg, 2009). Operational engineering refers to PE experts with operating backgrounds and industrial focus who are able to add value to target companies. More reputable PE firms tend to recruit professionals with various backgrounds (Kaplan and Stromberg, 2009) who use their knowledge to identify attractive investment opportunities and help improve value creation. The PE firms' reputation therefore is expected to be associated with operational engineering. Financial engineering refers to the tax shield and free cash flow pressure resulting from the use of debt (Kaplan, 1989). Higher leverage also prevents managers from wasting money because of the need to repay principal and service interest payments (Kaplan, 1989; Kaplan and Stromberg, 2009; Harford and Kolasinski, 2010). The controlling effect of debt is greater the lower the multiple of profits or cash flow to interest payments as this leaves less scope for managers to engage in activities that jeopardize the company's ability to service borrowings (Nikoskelainen and Wright, 2007). Governance engineering refers to PE firms' monitoring, governance intervention, and incentive alignment. PE firms monitor as active board members to minimize management inefficiency (Christian and Marc, 2012). PE firms often replace company's executives, call more board meetings (Acharya *et al.*, 2010), and tend to dramatically decrease

board size (Cornelli and Karakas, 2011). Moreover, buyout investors improve incentive alignment between shareholders and managers by adopting stock options or motivating managers to make a meaningful investment and avoid manipulating short-run performance (Jensen, 1989; Kaplan, 1989).

2.2. SMBOs Improve Performance?

Some authors suggest that performance may improve in SMBOs because of PE firms' early exit. In the primary buyout phase, PE-backed buyouts tend to obtain greater performance improvements compared with non-PE-backed buyouts because of PE firm active monitoring that reduces agency costs (Cressy *et al.*, 2007; Nikoskelainen and Wright, 2007).

Private equity firms' strong industry background and operational experience can also improve target company performance (Kaplan and Stromberg, 2009). As PE funds have limited lives, some primary PE investors may need to exit investments before all potential improvements to particular portfolio companies are achieved. Alternatively, PE funds may exit primary portfolio company investments prematurely to create a track record to enhance their reputation (Stromberg, 2008; Harford and Kolasinski, 2010; Achleitner and Figge, 2012). Finally, some non-PE-backed primary buyouts could introduce governance mechanisms (e.g., PE backing or high leverage) on SMBO. Those buyouts would be expected to exhibit an improvement in performance in the SMBO phase.

Primary buyouts of some (smaller) private companies are backed by relatively small PE firms (Kitzmann and Schiereck, 2009). The small PE firms may lack the experience and human resources to assist development once the target companies reach a certain level. In the SMBO phase, the entry of larger more profitable PE firms with specific complementary knowledge and skills may help them realize further performance improvements (Acharya *et al.*, 2010; Sousa, 2010; Wang, 2012). In those cases, the PE firms' reputation is expected to be an important determinant of performance.

Private equity firms may also replace existing management, in order to hire more capable managers and to initiate changes in the compensation structure. For example, a new compensation structure could enable management to acquire a greater equity stake in the company, which increases their incentive to improve efficiency and provides them with more discretion, in terms of implementing entrepreneurial decisions. When management stays on board and increases their equity (Wright *et al.*, 2000a), the target companies also benefit

from their continuing involvement. Specifically, whereas traditional agency theory in buyouts only emphasizes the reduction of costs caused by over-investment and over-diversification, the strategic entrepreneurship perspective emphasizes that managers and PE firms are strongly motivated to employ their idiosyncratic knowledge, skills, experience, and capabilities to exploit growth opportunities (Wright *et al.*, 2000b; Meuleman *et al.*, 2009). PE firms and management may pursue growth opportunities even though it may not be reflected initially in profitability because it can enhance company value and size, making eventual exit through IPOs or trade sale more feasible.

2.3. SMBOs Buy Time?

In contrast, a number of arguments suggest that SMBOs are not likely to improve the performance of target companies. Rather, they are used to buy more time before IPO or trade sale exits. For example, the effects of the buyout performance improvement mechanisms (management monitoring, PE firm's participation, and leverage) introduced in the first transaction are likely to last for 2–3 years after buyout (Wiersema and Liebeskind, 1995; Wright *et al.*, 2009). Extensive evidence from primary buyouts has identified increases in accounting profitability and productivity (Kaplan, 1989; Cumming *et al.*, 2007; Meuleman *et al.*, 2009) as well as in real economic productivity and efficiency (Lichtenberg and Siegel, 1990; Harris *et al.*, 2005) during this time compared with pre-buyout.

After this period, the speed of performance improvement seems to decline (Jelic and Wright, 2011). The benefits from squeezing out productivity improvements may gradually become exhausted whereas associated lack of slack resources may mean that adaptations to changing conditions are restricted when niche markets begin to mature and decline.

In addition to pressure to exit because the fund is coming toward the end of its life, PE firms will also 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 value added cannot be increased. A public offering or trade sale would usually be the first exit choices (Schwienbacher, 2002; Jelic, 2011). When a public offering and a trade sale are not available, a secondary sale may be one of the few options left.

Although management investments in SMBOs are usually higher as a result of their greater bargaining power from performance in the first deal (Manchot, 2010; Achleitner and Figge, 2012) and may lead to a

search for more growth opportunities, it may also induce greater entrenchment behavior. To the extent that greater bargaining power of management is associated with reduced monitoring by PE investors in an SMBO compared with a primary buyout, search and pursuit of new growth opportunities may be riskier especially outside areas of existing expertise, with adverse implications for performance.

3. DATA AND METHODOLOGY

3.1. Data and Sample Descriptive Statistics

We initiated our data collection with the Centre for Management Buyout Research (CMBOR) database. The original deal list comprises 612 UK SMBOs deals completed during 2000–2007.[2] We then collected data on activities, deal values, PE backing, and capital structure in the transaction year (from CMBOR, Thomson One Banker, PE firms' websites, and www.growth-business.co.uk). We also obtained data on exit status and exit routes of the buyouts until end of 2010. Finally, we collected data on changes in management and management equity stakes from FAME, Nexis UK, Keynote, and annual reports.[3]

The majority of firms in our sample are small-size to medium-size private companies and, therefore, not available on either Thomson One Banker or Worldscope databases.[4] Thus, we choose the FAME database to collect financial information.[5] We were able to collect financial details (for up to 10 years) together with details about directors, shareholders, subsidiaries, and industry for 516 sample SMBOs. We excluded SMBOs from the financial sector because their financial reports are different from other industries. The aforementioned sample selection procedure resulted in our final sample consisting of 491 SMBOs (Table 1). The majority of sample buyouts (323) are PE backed. The remaining 168 deals are pure buyouts (i.e., they did not receive PE funding). Among the 491 sample SMBOs, 48% exited their SMBO structure during the sample period. Trade sale (82 deals) is the most popular exit route from SMBOs. TMBO is the second most popular exit route (69 deals), followed by receivership (including administration) (41 deals) and IPOs (12 deals).

Business services (41%) is the largest industry group in our sample, followed by consumer (23%) and business and industrial (21%) sectors.[6] As to exit routes, IPO exits tend to be more common in Internet and computers, communication and electronics, and consumer sectors. TMBO and receivership exits tend to be more

Table 1.   Sample SMBOs

	Population	Sample		
	N	*N*		% of population
Total number of SMBOs	612	491		80.2
PE backed (% of *N*)	−396 (64.7)	−323 (65.8)		81.6
Non-PE backed (% of *N*)	−216 (35.3)	−168 (34.2)		77.8
Non-exits (% of *N*)	358 (58.5)	287 (58.5)		80.2
Exits from SMBO (% of *N*)	254 (41.5)	204 (41.5)		80.3
IPO (% of exits)	−12 (4.7)	−12 (5.9)		100.0
TMBO (% of exits)	−83 (32.7)	−69 (33.8)		83.1
Sale (% of exits)	−95 (37.4)	−82 (40.2)		86.3
Receivership (% of exits)	−64 (25.2)	−41 (20.1)		64.1

This table presents population and sample secondary management buyouts (SMBOs) by private equity backing and by exit status, from 2000 to 2010. Non-exits are sample buyouts that have not exited their SMBO structure by 31 December 2010. Exit routes are initial public offering (IPO), tertiary management buyout (TMBO), trade sale (Sale), and receivership.

popular in business services. Similarly, PE-backed SMBOs tend to be more popular in business services and consumer sectors.[7] Definitions of all variables used in the analysis are presented in Table 2. Sample descriptive statistics are presented in Table 3.

Private-equity-backed SMBOs are approximately twice as large as their non-PE-backed counterparts. Management's share of the total equity is 59.8% on average (median is 59.9%). Non-PE-backed SMBOs tend to receive almost three times more management investment. Average (mean) debt coverage is 5.02, indicating that SMBOs are highly leveraged. PE-backed SMBOs exhibit significantly higher gearing ratios compared with their non-PE-backed counterparts. The average (mean) duration of sample buyouts, in their primary buyout phase, is 49.83 months.[8] The average duration of sample SMBOs is 40.57 months. The chief executive officer (CEO) and chief financial officer were changed in 135 cases in the SMBO year. PE-backed SMBOs tend to replace management more often compared with non-PE-backed buyouts. The difference between PE-backed and non-PE-backed samples is, however, not statistically significant. [9]

3.2. Methodology

Performance Measures. The profitability of SMBOs is measured as return on assets (*ROA*) and return on sales (*ROS*). We also calculate labor productivity (*SALEMP*), sales growth (*SALG*), and employment growth (*EMPG*) (Delmar *et al*., 2003; Meuleman *et al*., 2009). Sales growth captures growth in additional revenue creation whereas employment growth captures the growth in labor resources.

The abnormal performance is calculated as the difference between actual performance and expected performance, as follows:

$$AP_{it} = P_{it} - E\left(P_{it}\right) \qquad (1)$$

where P_{it} is the actual performance of company *i* in year *t*; $E(P_{it})$ is the expectation of performance of company *i* in year *t*; AP_{it} is the abnormal performance for various performance ratios: *ROA*, *ROS*, *SALEMP*, *EMPG*, and *SALG*. Earnings may be deliberately overstated in the year before IPO or other exit (Jain and Kini, 1995). Hence, we adopt the median performance in the 3-year period before exit as a measure of the pre-SMBO performance.[10] We compare the performance in each year post-event with the expected SMBO performance, for a period of up to 5 years.[11] Our expected performance model is based on both the 'level' and 'change' models suggested by Barber and Lyon (1996). The level model uses a company's 3-year median pre-SMBO performance as expected performance (Equation (2)). The change model uses the company's past performance plus the change in the industry's performance as the expected performance (Equation (3)). The expected performance models are as follows:

$$E(P_{it}) = P_{i,t-3} \qquad (2)$$

$$E(P_{it}) = P_{i,t-3} + \Delta PI_{it} \qquad (3)$$

where P_{it-3} is 3-year median pre-SMBO performance of company *i*. PI_{it} is defined as the industry performance (control group) for company *i* in period *t*. ΔPI_{it} is the difference between the industry's performance in period *t* and the industry's 3-year median pre-SMBO performance.

Table 2. Definitions of Variables

Description	Variable	Definition
	Performance measures	
Profitability ratios		
Return on assets	*ROA*	Earnings before interests and taxes (EBIT) scaled by total assets.
	EBITDAA	Earnings before interests, taxes, depreciation, and amortization (*EBITDA*) scaled by total assets.
Abnormal return on assets	*AROA*	The difference between actual ROA in year t and expected ROA in year t.
	AEBITDAA	The difference between actual *EBITDAA* in year t and expected *EBITDAA* in year t.
Return on sales	*ROS*	Earnings before interests and taxes (EBIT) scaled by total sales.
	EBITDAS	Earnings before interests, taxes, depreciation, and amortization (*EBITDA*) scaled by total sales.
Abnormal return on sales	*AROS*	The difference between actual ROS in year t and expected ROS in year t.
	AEBITDAS	The difference between actual *EBITDAS* in year t and expected *EBITDAS/i>* in year t.
Labor productivity ratios		
Sales productivity	*SALEMP*	Inflation adjusted sales scaled by the number of employees.
Abnormal sales productivity	*ASALEMP*	The difference between actual SALEMP in year t and expected SALEMP in year t.
Growth indicators		
Employment growth	*EMPG*	The difference between the numbers of employee in year t and year $t-1$ scaled by average of number of employees in year t and year $t-1$.
Abnormal employment growth	*AEMPG*	The difference between actual SALEMP in year t and expected SALEMP in year t.
Sales growth	*SALG*	The difference between sales in year t and year $t-1$ scaled by average of sale in year t and year $t-1$.
Abnormal sales growth	*ASALG*	The difference between actual SALEMP in year t and expected SALEMP in year t.
	Determinants of performance	
Managerial equity ownership		
Management share	*MGTSHARE*	The percentage of target company's common equity contributed by management in year t.
Debt bonding		
Debt coverage	*DEBTCOV*	The amount of long-term and short-term debt divided by operating income before interests, taxes, depreciation and amortization (*EBITDA*) in year t.
PE backing		
PE backed	*PE*	A dummy variable, which equals to 1 if SMBO is backed by PE firms and 0 otherwise.
Backed by more reputable PE firms	*TOP10*	A dummy variable, which equals to 1 if SMBO was backed by one of the top 10 most reputable PE firms and 0 otherwise.
Governance intervention		
Management changing	*MGTCHAN*	A dummy variable, which equals to 1 if the CEO or CFO is replaced in the transaction year, and 0 otherwise.
	Determinants of PE backing and control variables	
Companies' size	*SIZE*	The deal value (£ million).
Companies' industry	*BSERVICES*	A dummy variable, which equals to 1 if the SMBO is from business service industry, and 0 otherwise.
Gearing	*GEAR*	The sum of long-term and short-term debt divided by the total equity.
Financial crisis	*Crisis*	A dummy variable, which equals to 1 for observations from 2008, 2009, and 2010 (the financial crisis years) and 0 otherwise.
Lambda	*Lambda*	The fitted probability of receiving PE backing, estimated by Equation (4).
Pre-SMBO ratios	*Pre*	The performance ratios (*PreROA*, *PreROS*, *PreSALEMP*, *PreEMPG*, and *PreSALG*) in year preceding the SMBO.
Post	*POST*	A dummy variable equal to 1 for performance ratios up to 5 years after the SMBO transaction, and 0 otherwise.
The longevity of buyout	*1st DURA*	1st duration indicates the number of months from the primary buyout date to the SMBO date.
	2nd DURA	The number of months from the SMBO date to the exit date if the SMBO exited.
	2nd DURA_all	The number of months from the SMBO date to the exit date if the SMBO exited or the number of months from the SMBO date to the last date (31 December 2010) if the SMBO did not exit.

Table 3.   Sample Descriptive Statistics

	Full sample			PE backing (median)		
	Mean	Median	SD	PE	Non-PE	*P*-value
SIZE	96.133	31.300	189.865	45.500	5.500	(0.000)
GEAR	1.551	0.780	2.093	0.824	0.670	(0.000)
MGTSHARE	0.598	0.599	0.351	0.370	1.000	(0.000)
DEBTCOV	5.025	1.434	32.060	1.358	1.649	(0.192)
1st DURA	49.830	45.000	28.697	44.000	48.500	(0.564)
2nd DURA	40.574	37.500	20.465	38.000	37.000	(0.548)
2nd DURA_all	56.637	54.000	26.212	50.000	63.000	(0.000)

This table presents results for sample SMBOs characteristics. All variables are defined in Table 2. *P*-values (in brackets) are for Mann–Whitney test for median differences in *SIZE*, *GEAR*, *MGTSHARE*, *DEBTCOV*, *1st DURA*, and *2nd DURA*. Values of *GEAR*, *MGTSHARE*, and *DEBTCOV* are computed for full sample, up to 5 years after SMBOs.

In our univariate analysis, we test whether the abnormal performance is significantly different from the first to fifth post-event years. As there are outliers in our data, all estimates are based on winsorized data.[12] In addition, we employ a Wilcoxon signed-rank test to test whether the median value of abnormal performance in each post-event year equals zero or not.

Determinants of Performance. Our sample descriptive statistics show that PE-backed SMBOs tend to be different from non-PE-backed SMBOs in terms of industry distribution, size, and pre-event performance. These differences suggest that PE firms do not randomly choose companies in which to invest but conduct due diligence to select companies with a greater probability of success after SMBOs. To address selection bias, we employ a Heckman two-step estimation procedure (Jelic and Wright, 2011). In the first step, we estimate a probit regression with a PE dummy equal to 1 if PE-backed and 0 otherwise. This step allows us to estimate the probability of receiving PE backing (*Lambda*). The second stage employs a panel regression via a generalized least squares random-effects procedure with robust standard errors. We prefer the panel method over standard ordinary least squares as the panel method utilizes data from the entire post-event (i.e., SMBO) period whereas ordinary least squares relies on data from only one post-event year. In addition, the panel data method takes into account the effects of estimation error due to the correlation of the residuals across firms (Fama and French, 2001).

We hypothesize that choice of PE backing is associated with size (as in Brau *et al.*, 2003 and Stromberg, 2008), pre-event performance (as in Bienz, 2004 and Sudarsanam, 2005), and industry (as in Berger *et al.*, 1999 and Bayar and Chemmanur, 2006). The probit model is as follows[13]:

$$PE_i = \alpha + \beta_1 BSERVICES_i + \beta_2 \ln SIZE_i \qquad (4)$$
$$+ \beta_3 PreROA_i + \varepsilon_i$$

where *PE* is a dummy variable equal to 1 if the SMBO receives PE backing, and 0 otherwise; *BSERVICES* denotes a dummy variable equal to 1 if the SMBOs is from business service industry, and 0 otherwise. ln*SIZE* indicates the logarithm of SMBO deal's value. *PreROA* is return on assets in the year before SMBOs.

In the second stage model, we regress change in performance ratios (*AROA*, *AROS*, *ASALEMP*, *AEMPG*, and *ASALG*) on variables for managerial equity ownership (*MGTSHARE*); gearing (*GEAR*); debt bonding (*DEBTCOV*); PE firms' involvement (*PE*); and governance intervention (*MGTCHAN*). Control variables are natural logarithm of companies' size (*SIZE*), the financial crisis effect (*Crisis*), *Pre*-SMBO ratios, natural logarithm of duration of SMBOs (*2nd DURA_all*), and the fitted probability of receiving PE backing (*Lambda*). The regression model is as follows:

$$Ratios_{it} = \alpha + \beta_1 MGTSHARE_{it} + \beta_2 GEAR_{it}$$
$$+ \beta_3 DEBTCOV_{it} + \beta_4 PE_{it}$$
$$+ \beta_5 MGTCHAN_{it} + \beta_6 \ln SIZE_{it} \qquad (5)$$
$$+ \beta_7 Crisis_{it} + \beta_8 PRE_{it} + \beta_9 \ln 2nd\ DURA\_all_{it}$$
$$+ \beta_{10} Lambda_{it} + \varepsilon_{it}$$

More reputable PE firms tend to be more effective both in monitoring target companies and in adding value via operational engineering. More reputable PE firms use their superior network and experience to exploit growth opportunities for target companies. Companies backed by more reputable PE firms are, therefore, more likely to generate better post-buyout performance. For instance, Meuleman *et al.* (2009) find that PE firms' experience is positively associated with the growth of

buyout companies. Jelic *et al.* (2005) also demonstrated that buyouts backed by more reputable PE firms tend to have better performance, in the long run, than those backed by less reputable PE firms.

We rank PE firms on the basis of the reputation score established by Jelic (2011).[14] The 10 most reputable PE firms are as follows: 3i, Cinven, Bridgepoint (formerly Nat West Partners), Charter House, Candover, Electra, Legal and General Ventures, Schroeder, IRRfc (used to be known as Phildrew Ventures), and Hg Capital (formerly Mercury Asset Management). We then create a dummy variable (*TOP10*) that equals 1 when the SMBO is backed by one of the top 10 PE firms, and 0 otherwise.[15] We then test for the reputational effect, in the PE-backed subsample, within the following regression model:

$$Ratios_{it} = \alpha_{it} + \beta_1 MGTSHARE_{it} + \beta_2 GEAR_{it}$$
$$+ \beta_3 DEBTCOV_{it} + \beta_4 TOP10_{it}$$
$$+ \beta_5 MGTCHAN_{it} + \beta_6 \ln SIZE_{it}$$
$$+ \beta_7 Crisis_{it} + \beta_8 PRE_{it}$$
$$+ \beta_9 \ln 2nd\ DURA_{allit} + \beta_{10}\ Lambda_{it} + \varepsilon_{it}$$
$$(6)$$

4. RESULTS

4.1. Univariate Analysis

Table 4 reports the results of various performance measures. Panels A and B report the panel statistics of pre-SMBO and post-SMBO performance measures, respectively. Comparing the two panels, *EMPG* and *SALG* decrease in both mean and median values from pre-SMBO to post-SMBO. Notably, the mean value for (post-SMBO) *EMPG* is negative. Similarly, mean *ROS* decreases after SMBO. By contrast, *SALEMP* increases slightly in both mean and median values after SMBO. *ROA*, on average, has greater increases after SMBO. As the standard deviation indicates, there are significant differences in the profitability (*ROA* and *ROS*) of our sample buyouts.[16] PE-backed SMBOs tend to perform better in profitability and growth but worse in terms of labor productivity, compared with non-PE-backed deals.

Table 5 presents the median abnormal ratios (AR) (based on Equations (1) and (2)) and industry adjusted AR (based on Equations (1) and (3)) up to 5 years after the SMBO's transaction year. To control for industry influence, we collected performance data for all UK active and inactive private companies (40,267 companies from FAME database) and estimate relevant median industry ratios.

Our level abnormal performance for profitability ratio *AROA* is significantly negative in each post-SMBO year, consistent with previous UK SMBO studies (Jelic and Wright, 2011; Wang, 2012). When scaled by sales, profitability (*AROS*) shows an increase (not statistically significant) in the first year after SMBO, followed by a statistically significant decrease (years 4 and 5). The industry adjusted changes show similar negative and statically significant results, but of a smaller magnitude.

Table 4.   Summary Results of Performance Measures

		Full sample					PE backing (median)		
	N	Min.	Mean	Median	Max.	SD	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)

This table presents summary results of various performance measures and their results by PE backing. Panels A and 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. *P*-values (in brackets) are for Mann–Whitney test for differences between PE-backed and non-PE-backed subsamples.

Table 5. Summary Results for the Post-SMBO Abnormal Performance

	Benchmarks	Y1	Y2	Y3	Y4	Y5
Profitability ratios						
AROA	$E(P_{it}) = P_{it-3}$	-0.008^{**} (294:137)	-0.016^{***} (255:101)	-0.030^{***} (191:69)	-0.036^{***} (151:52)	-0.047^{**} (103:36)
	$E(P_{it}) = P_{it-3} + \Delta PI_{it}$	-0.002 (230:113)	-0.024^{***} (197:79)	-0.042^{***} (141:51)	-0.041 (83:29)	-0.062^{***} (47:14)
AROS	$E(P_{it}) = P_{it-3\text{-}year}$	0.008 (236:128)	-0.001 (204:101)	-0.004 (153:84)	-0.014 (123:50)	-0.017 (91:31)
	$E(P_{it}) = P_{it-3\text{-}year} + \Delta PI_{it}$	0.008 (184:101)	-0.003 (161:78)	-0.011^{**} (116:46)	-0.008 (67:30)	-0.025^{*} (42:16)
Productivity ratios						
ASALEMP	$E(P_{it}) = P_{it-3\text{-}year}$	0.038^{***} (234:159)	0.030^{***} (199:128)	0.025^{***} (146:88)	0.022 (125:73)	-0.023^{***} (82:35)
	$E(P_{it}) = P_{it-3} + \Delta PI_{it}$	-0.027^{***} (175:61)	-0.040^{***} (148:51)	-0.067^{***} (108:30)	-0.072^{***} (67:19)	-0.096^{**} (30:7)
Growth ratios						
AEMPG	$E(P_{it}) = P_{it-3}$	-0.004 (226:110)	-0.022^{***} (191:77)	-0.039^{***} (144:55)	-0.038^{**} (83:28)	-0.056^{**} (48:15)
	$E(P_{it}) = P_{it-3} + \Delta PI_{it}$	-0.015 (167:76)	-0.028^{***} (142:61)	-0.039^{***} (101:30)	-0.063^{***} (54:20)	-0.006 (24:11)
ASALG	$E(P_{it}) = P_{it-3}$	-0.016^{*} (204:94)	-0.046^{***} (177:74)	-0.050^{***} (132:50)	-0.098^{***} (73:21)	-0.126^{***} (47:11)
	$E(P_{it}) = P_{it-3} + \Delta PI_{it}$	0.021 (171:93)	0.003 (151:77)	-0.026 (109:50)	0.003 (59:31)	-0.041 (36:16)

This table presents median abnormal performance measures for full sample, up to five post-SMBO years (Y 1–5). Abnormal performance (AP_{it}) estimated as $AP_{it} = P_{it} - E(P_{it})$. P_{it} is the actual performance ratio during post-event period and $E(P_{it})$ is expected performance of the SMBO during post-event period. $P_{it}E(P_{it})$. All results are based on winsorized data. We employ the Wilcoxon signed rank test for median = 0 versus median ≠ 0. Total number of observations and number of observations with positive values are reported in brackets. ***, **, and * indicate significance of the test at 1%, 5%, and 10% levels, respectively.

Consistent with Jelic and Wright (2011), our results for level abnormal performance show a significant increase in labor productivity (measured by *ASALEMP*) up to 4 years after SMBO. However, the positive performance tends to decrease, becoming significantly negative in the fifth year. Moreover, when we control for industry influence, the positive changes disappear. Similar to the profitability ratios, there are significant reductions in the level growth ratios (measured by *AEMPG* and *ASLG*). After adjusting for industry, sales growth increases in years 1, 2, and 4. The increase in growth, however, is not statistically significant. Overall, our results suggest that performance generally deteriorates after SMBO.

Private-equity-backed SMBOs generally outperform their non-PE-backed counterparts in terms of profitability (*AROS*) and labor productivity (*ASALEMP*) for up to 2–4 years (Table 6). However, the differences are statistically significant only in respect of labor productivity. Furthermore, PE-backed SMBOs significantly underperform their counterparts (in years 3 and 5) measured by *AROA*. Our results for growth ratios fluctuate over the 5-year post-SMBO period. Generally, PE-backed SMBOs outperform in growth in the first post-SMBO year and underperform in the following 2–3 years, before recovering. Overall, the results provide mixed evidence of the effects of PE backing on the performance.

4.2. Regression Results

The results of our first stage regression (Equation (4)) are reported in Table 7. The model provides an excellent fit. 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.

Table 8 presents the results of the panel regressions (Equation (5)) for determinants of SMBO performance.[17] The R^2s vary from 4.37% (estimates for *AROA*) to 23.02% (estimates for *ASALG*). Wald χ^2 statistics is statistically significant in all models except for *AROS*.

Our results demonstrate that SMBOs with greater debt coverage (*DEBCOV*) have worse performance in the *ASALEMP* models. Similarly, SMBOs with higher gearing tend to exhibit worse profitability (*AROA* and *AROS*). PE backing is not significantly associated with changes in performance. This is somewhat inconsistent with our univariate analysis. The difference could be due to sample selection bias, which was not controlled for in the univariate analysis.

Table 6. Differences in Post-SMBO Abnormal Performance by PE Backing

	Benchmarks	YI	Y2	Y3	Y4	Y5
Profitability ratios						
AROA	$E(P_{it}) = P_{it-1}$	<0.365	<0.104	<0.022	<0.115	<0.000
	$E(P_{it}) = P_{it-1} + \Delta PI_{it}$	<0.123	<0.184	<0.037	<0.166	<0.115
AROS	$E(P_{it}) = P_{it-1}$	>0.633	>0.596	>0.294	>0.468	<0.011
	$E(P_{it}) = P_{it-1} + \Delta PI_{it}$	>0.756	>0.286	<0.497	>0.548	<0.386
Productivity ratios						
ASALEMP	$E(P_{it}) = P_{it-1}$	>0.029	>0.123	>0.309	<0.736	<0.000
	$E(P_{it}) = P_{it-1} + \Delta PI_{it}$	>0.128	>0.078	>0.134	<0.242	<0.267
Growth ratios						
AEMPG	$E(P_{it}) = P_{it-1}$	>0.185	<0.973	<0.271	>0.970	>0.635
	$E(P_{it}) = P_{it-1} + \Delta PI_{it}$	>0.271	>0.744	<0.416	<0.712	>0.061
ASALG	$E(P_{it}) = P_{it-1}$	>0.294	<0.232	<0.329	<0.129	<0.533
	$E(P_{it}) = P_{it-1} + \Delta PI_{it}$	>0.842	<0.543	<0.353	<0.092	>0.849

This table presents *P*-values for Mann–Whitney test for differences in median abnormal performance measures for PE-backed SMBOs and non-PE-backed SMBOs, up to 5 years after SMBOs. 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 SMBO during post-event period. '>' indicates PE-backed SMBOs outperform non-PE-backed SMBOs; '<' indicates PE-backed SMBOs underperform non-PE-backed SMBOs.

Table 7. Determinants of PE Backing

Independent variables	Coefficient
BSERVICES	−0.314[***]
lnSIZE	1.402[***]
PreROA	0.869[***]
Intercept	−0.844[***]
Log likelihood	−470.078
Pseudo-R^2 (%)	29.10
Wald χ^2	231.60[***]
N	1295

This table shows the results of pooled probit model with robust variance estimate for the probability of receiving PE backing by the sample SMBOs. Dependent variable: PE (a dummy variable equaling to 1 if the SMBO received 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), and *PreROA* (the value of return on assets in 1 year before SMBO). This model converged after three iterations. *P*-values for the Wald test (Wald χ^2) is for profitability $>\chi^2$. *N* is the number of pooled sample SMBOs used for the estimation, from the first to fifth post-SMBO years.
[***] is significant at the 1% level.

The coefficients for changes in management equity stakes (*MGTSHARE*) are predominantly positive (but not statistically significant) except in models for *AROS* and *AEMPG*. The coefficients for CEO/CFO changes (*MGTCHAN*) are positive (and statistically significant) in the *ASALEMP* models, suggesting that changing CEO and/or CFO may improve the sales efficiency of buyouts. Notably, changes of CEO/CFO tend to be negatively associated with profitability (measured by *AROS*) and employment growth (at 10% level of significance).

With regard to the control variables, it appears that the financial crisis is negatively associated with profitability (*AROA*) and growth (*AEMPG* and *ASALG*). Our results demonstrate that companies with better pre-SMBO profitability (*AROA*) and growth (*AEMPG* and *ASALG*) tend to perform worse in the post-SMBO period.

The PE reputation (*TOP10*) is significantly positively associated with *AROA* and *AEMPG*, indicating that the reputation of PE firms has positive influence on the profitability and growth of target companies (Table 9). Notably, SMBOs backed by more reputable PE firms perform worse in terms of *ASALEMP*.

Overall, the main drivers of the improvements in SMBO performance are PE reputation (profitability and employment) and replacement of management (labor productivity).

5. ROBUSTNESS AND FURTHER ANALYSIS

In this section, we conduct further analysis to examine the robustness of our results. First, we present robustness checks to choice of different benchmarks. Second, we test for alternative measures of profitability. Third, we test the post-SMBO abnormal performance in subsamples for different exit routes. Finally, we compare performance of early and late exits from sample SMBOs.

5.1. Alternative Benchmarks

To further investigate performance of sample SMBOs, we compare their performance with the performance

Table 8. Determinants of Post-SMBO Performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
MGTSHARE	0.060	−0.442[*]	0.025	−0.029	0.077
GEAR	−0.018[***]	−0.102[**]	0.002	−0.004	−0.000
DEBTCOV	0.000	0.013	−0.001[***]	−0.001	−0.001
MGTCHAN	0.030	−0.079	0.084[**]	−0.022	0.048
PE	−0.060	−0.294	0.097	0.037	0.098
lnSIZE	0.172	0.127	0.098	0.050	−0.033
ln2nd DURA_all	−0.457	0.643	−0.114	0.054	−0.067
Crisis	−0.031[***]	0.073	0.001	−0.054[*]	−0.089[***]
PreROA	−0.475[**]	−0.579	−0.023	−0.498[***]	−0.620[***]
Lambda	0.325	0.319	0.233	0.086	−0.209
Intercept	0.476	−0.948	−0.034	−0.202	0.143
Wald χ^2	41.72[***]	8.39	60.10[***]	24.74[***]	35.71[***]
R^2 (%)	4.37	4.66	4.59	18.58	23.02
N	501	432	390	397	373

This table reports the results of panel regression for determinants of post-SMBO abnormal performance, up to 5 years after SMBO. The dependent variables (AP_{it}) are estimated as $AP_{it} = P_{it} − E(P_{it})$, where $E(P_{it}) = P_{i,t−1}$. The results are based on winsorized data. All parameters are estimated by a generalized least squares random-effects model with robust standard error and omitted collinear covariates. *P*-values for the Wald test (Wald χ^2) is for profitability $>\chi^2$. N reports the number of firm-year observations used in the panel model.
[***], [**], and [*] are significant at the 1%, 5%, and 10% levels, respectively.

Table 9. PE Reputation and Post-SMBO Abnormal Performance

	AROA	AROS	ASALEMP	AEMPG	ASALG
MGTSHARE	0.049	0.015	−0.069[*]	−0.004	−0.035
GEAR	−0.010	−0.043	0.004	−0.001	0.006
DEBTCOV	0.000	0.006	−0.001[***]	0.001	0.001
MGTCHAN	0.006	−0.107	0.052	0.031	0.014
TOP10	0.061[**]	0.268	−0.060[*]	0.085[*]	0.065
lnSIZE	0.034	0.113	0.040	0.026	0.022
ln2nd DURA_all	−0.065	0.820	0.075	−0.185[*]	−0.027
Crisis	−0.013	0.106	−0.009	−0.023	−0.049
Pre	−0.685[***]	−0.880[*]	−0.012	−0.757[***]	−0.628[***]
Lambda	−0.030	−0.765	0.003	−0.058	−0.226
Intercept	0.122	−1.471	−0.074	0.305	0.123
Wald χ^2	33.83[***]	6.01	23.43[***]	40.11[***]	32.83[***]
R^2 (%)	24.15	9.1	4.94	41.92	25.59
N	200	177	159	162	159

This table reports the results of panel regression for the effect of PE reputation on post-SMBO abnormal performance, up to 5 years after SMBO. The results are based on winsorized data. All parameters are estimated by a generalized least squares random-effects model with robust standard error and omitted collinear covariates. *P*-values for the Wald test (Wald χ^2) is for profitability $>\chi^2$. N is number of observations used for the estimation, from the first to fifth post-SMBO years.
[***], [**], and [*] are significant at the 1%, 5%, and 10% levels, respectively.

of primary buyouts. The results, presented in panel A of Table 10, demonstrate significant underperformance of SMBOs in profitability, labor productivity and growth, although there is a significant outperformance of SMBOs 1 year after buyout in terms of labor productivity. We also match our sample SMBOs with primary buyouts on the basis of the following: industry classification, size (measured by logarithm of median total asset 3 years before buyouts), pre-event performance (measured by median ROA 3 years before buyouts), and buyout year. We adopt a propensity score matching method similar to that in Rosenbaum and Rubin (1983). This approach overcomes the decrease in specification

and power of statistical results using traditional matching approaches.[18] Results of comparisons between matched samples are reported in panel B. The results confirm worse performance of our sample SMBOs compared with primary buyouts. Our findings, therefore, support the earlier presented evidence that performance deteriorates after SMBOs.

5.2. Alternative Performance Measures

As depreciation and amortization may be used to manage earnings, earnings before interests and taxes (EBIT) may provide a misleading picture of underlying

Table 10. Differences in Abnormal Performance between SMBOs and Primary Buyouts

	YI	Y2	Y3	Y4	Y5
Panel A: Comparison of non-matched samples					
Profitability ratios					
AROA	-0.049^{***}	-0.053^{***}	-0.059^{***}	-0.134^{***}	-0.041
AROS	-0.002	-0.008^{*}	-0.011^{***}	-0.020^{***}	-0.022^{**}
Productivity					
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: Comparison of matched samples					
Profitability ratios					
AROA	-0.067^{***}	-0.070^{***}	-0.082^{***}	-0.146^{***}	-0.052
AROS	-0.000	-0.004	-0.018^{***}	-0.028^{***}	-0.033^{*}
Productivity					
ASALEMP	0.020^{*}	-0.010	-0.022	-0.090^{***}	-0.852^{***}
Growth ratios					
AEMPG	-0.014	-0.015	-0.038^{**}	-0.008	-0.110
ASALG	-0.010	-0.063	-0.089^{***}	-0.067	-0.213^{***}
Number of SMBOs			152		
Number of primary MBOs			152		

This table presents the difference in median abnormal performance measures for SMBOs and primary private-to-private buyouts, up to 5 years after SMBO. Abnormal ratios calculated using the following benchmark: $E(P_{it}) = P_{it-1}$. Differences are estimated as abnormal performance of SMBOs in year t minus abnormal performance of primary private-to-private buyouts in year t. Panel A shows the differences in full samples. Panel B shows the differences in matched samples. The propensity score matching is based on industry, size, pre-buyout performance, and buyout year. All results are based on winsorized data. We employ the Mann–Whitney test to test the equality of abnormal performance from the two samples.
***, **, and * indicate significance at the 1%, 5%, and 10% levels, respectively.

performance changes. We therefore check the robustness of our results to use of profitability ratios based on income before depreciation and amortization (*EBITDAA*, *EBITDAS*). The unreported results suggest significantly negative changes in AR (*AEBITDAA*) and (*AEBITDAS*) from the first to fifth post-SMBO years.[19] Overall, our results show a declining trend from the first to fifth post-SMBO years. These results, therefore, are consistent with our findings based on ratios that use EBIT.[20]

5.3. Post-performance by Exit Routes

We also compare the performance of our sample SMBOs by their exit status. The unreported results of the comparison show that there are no significant differences in the performance of exited SMBOs (regardless of the exit route) versus non-exited SMBOs.[21] We then 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. IPO exits perform significantly better than TMBO deals in terms of growth (*AEMPG* and *ASALG*). Trade sales significantly outperform TMBO deals in labor productivity

(*ASALEMP*).[22] The aforementioned results are in line with the hypothesis that subsequent buyouts tend to be used to buy more time for less successful companies.

5.4. 'Early' versus 'Late' Exits

As discussed in Section 2, primary PE firms may exit early because of the limited life of PE funds or attempts to enhance their reputation by creating a track record. When PE firms exit early, especially in the first two to three buyout years, the efforts of value creation mechanisms may not be exhausted, thus leaving some room for the performance improvement. Alternatively, SMBOs could be adopted as a 'last resort' when a successful exit was not achieved during the holding period. Hence, it is important to examine the abnormal performance in the post-SMBO phase for buyouts with short (i.e. 'early' exits) and long primary buyout holding periods (i.e., 'late' exits).

We divide primary PE-backed buyouts into the early and late exit subsamples. The early subsample is defined as the primary holding period being equal to or shorter than 2 years. The late subsample is defined as the primaries' holding period being equal to or longer than 4 years. Our unreported results suggest lack of

improvement in the performance in the early sample.[23] For example, the results suggest a decline in profitability up to 5 years following SMBOs. In the late subsample, we find mixed evidence for profitability. Whereas *AROA* shows deterioration up to 4 years after SMBOs, *AROS* shows improvement in the first year after SMBO. The evidence on labor productivity (*ASALEMP*) shows statistically significant improvements up to 3 years. Combined evidence for early and late subsamples lends support to our previous findings regarding the importance of PE backing. Reported lack of improvements in the early subsample is also consistent with PE funds' decision to exit quickly from 'problematic' buyouts and/or buyouts without potential for value creation.

6. CONCLUSION

On the basis of a unique dataset of 491 UK SMBO deals, we analyze whether SMBOs experience an improvement in performance. Our univariate analysis reveals that there is a reduction in post-SMBO performance, in terms of profitability and growth. With respect to labor productivity, unadjusted abnormal performance shows significant improvement after SMBOs. However, after controlling for industry factors, the results suggest that SMBO are underperforming their industry peers. Our results also demonstrate a decreasing trend in profitability, labor productivity, and growth from the first to fifth post-SMBO years. The results are robust to the use of alternative performance measures and benchmarks.

Although PE backing (alone) does not seem to drive changes in performance, PE firms' reputation is important for improvements in profitability. Important factors affecting changes in labor productivity are gearing and replacement of management. High percentages of debt and management equity tend to be associated with poor profitability and labor productivity. With respect to exits from SMBOs, IPOs and trade sales exhibit better post-SMBO performance than TMBOs.

In sum, our analysis reveals intriguing findings regarding the contrasting experience of primary and secondary buyouts. Agency benefits, associated with debt and managerial equity stakes, seem to be exhausted in primary buyouts. Instead, there tends to be entrenchment behavior, where management from the primary buyout continues into the SMBO with a larger equity stake and less control by PE firms. Our findings are consistent with the efficiency improvements experienced in primary buyouts beginning to be exhausted. It appears that SMBOs are unable to adapt to changing market conditions and to identify growth opportunities in niche markets. Our findings also raise more general questions as to why PE firms continue to invest in SMBOs. PE firms having raised large funds need to find deals in which to invest. Yet it appears increasingly difficult to identify attractive primary deals due to competition with other funds, a reduction in deal flow from corporations restructuring through the divestment of divisions, and increasing difficulties in generating returns from public to private buyouts (Wright *et al.*, 2009, 2010). SMBOs do not appear in general to offer an attractive solution to this problem.

ENDNOTES

1. The recorded drop in the SMBOs entries and exits during the period of recent financial crisis is consistent with the worldwide evidence.
2. We end the list in 2007 to be able to track the performance up to 2010.
3. In most target companies, management does not directly invest in the equity. Instead, they invest in the parent companies with 100% stake in the target companies. Hence, we track the ownership structures of these companies to identify the management stakes in the ownership.
4. We cross-check our SMBO list with the total of 3243 UK buyout deals listed in Thomson One Banker, during 2000 and 2007. Thomson One Banker, however, lists only 167 UK SMBOs deals during our sample period.
5. FAME provides financial information for 7 million active and inactive UK and Irish companies.
6. We classify our sample buyouts into nine broad industries, in line with the technology and management expertise in the venture capital industry (Gompers et al., 2008): Internet and computers, communications and electronics, business and industrial, consumer, energy, biotech and healthcare, financial service, business service, and all others. 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 a three-digit primary SIC code of our sample companies and Venture Economics Industry Classification (VEIC industry group), by using the concordance of VEIC code and SIC code (Dushnitsky and Shaver, 2009). We are indebted to Gary Dushnitsky for providing us with the concordance that links VEIC and SIC schemes.
7. The unreported results of a Kolmogorov–Smirnov test suggest different industry distribution of sample SMBOs exited via TMBO and trade sale. The industry distributions of PE-backed and non-PE-backed sample SMBOs are also statistically different. The results are available upon request from authors.
8. This is consistent with earlier studies of buyouts (Stromberg, 2008; Jelic, 2011).

9. In PE-backed deals, management was changed in 29.41% cases. In the subsample of pure buyouts, the management was changed in 23.81% of cases. Unreported *P* value for the test of equal proportions is 0.187.

10. We excluded the event year 0, as it includes both pre-event and post-event operations, which are difficult to distinguish.

11. *t* is taking values for 1–5.

12. Winsorizing is performed by setting the observations below the first and above the 99th percentiles to the values at the first and 99th percentiles.

13. Unreported results of a Hosmer–Lemeshow goodness of fit test justify our performance for probit over logit model.

14. Reputation score = ½ * (ranking by number of deal leads) + ½ * (ranking by total equity funding in £m). The scores were calculated on the basis of data on deal leaders and PE investments in more than 4000 UK buyouts. We included Kohlberg Kravis Roberts & Co, and Apax in the most reputable PE firms, outside our criteria, as they had established a reputation internationally and are highly ranked in the most recent ratings of PE firms provided by Private Equity International (http://www.privateequityinternational.com/pei50). For more on the ranking and advantages of this method for ranking of PE firms, see Jelic (2011).

15. When it comes to syndicated PE backing, we adopt the reputation of lead PE firms, as lead PE firms are expected to be involved more in the investments than others.

16. Maximum *ROA* of 5415.09 was recorded for Ryness Ltd. The extreme value is due to a drastic decrease in total assets in 2010. Minimum *ROS* was recorded for SLR Group Ltd. The extreme value is due to very high administration expenses in 2007.

17. In addition to the regression model based on Equation ((5)), we also tried the following regression models: (i) model without control variables and *Lambda*; (ii) model without control variables; (iii) model without *Lambda*; and (iv) model without *GEAR*. The results of alternative models are economically and statistically consistent with the results reported in Table 8. The results are available upon request from authors.

18. We use probit estimation and one-by-one nearest matching without replacement. Unreported results find that one-by-one nearest matching with replacement shows similar results.

19. Because of space constraints, we do not report the results in full here, but they are available on request from the authors.

20. It is, however, worth noting that measures based on *EBITDA* yield lower profitability.

21. Because of space constraints, we do not report the results in full here, but they are available on request from the authors.

22. Receiverships, which are buyouts in the UK's bankruptcy process, underperform TMBO deals on all performance measures in the first post-SMBO year.

23. Because of space constraints, we do not report the results in full here, but they are available on request from the authors.

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