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THE CHANGE IN OWNERSHIP AFTER A BUYOUT:

IMPACT ON PERFORMANCE

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ABSTRACT

This paper analyses the impact of the change in ownership after a management buyout on both post-buyout efficiency and growth. We contrast family firm buyouts with divisional buyouts, and private equity (PE) financed buyouts with non-PE financed buyouts. We analyse the four-year post-buyout growth and efficiency of 167 Belgian companies (of which 43 are transfers from family owned businesses) that did a buyout between 1996 and 2003. Results show that the source of a buyout (family owned buyout versus divisional buyout) has no impact on the post-buyout growth, but the presence of a PE has. PE-backed buyouts grow less in assets, but more in employees. Neither sales growth nor efficiency are different between different types of buyouts.

KEY WORDS: Buyout, Ownership, Private Equity, Performance

INTRODUCTION

The transfer of a family owned business (FOB) or a division of a larger group can occur in different ways such as a trade sale, a liquidation, a buyout or an initial public offering (IPO). The transfer to the next generation is, of course, only applicable to FOBs (Howorth et al., 2004). Although latter option is a widely researched topic (Chittoor and Das, 2007), it is not always feasible as there are not always suitable heirs to takeover the family firm (Wright et al., 2006). Only 30% of the FOBs survives to the second generation and 15% makes it into the third generation of family ownership (Kets de Vries, 1993; Ward, 1987). A trade sale is not always a preferred exit route, as this can leave (family) owners with a fear for the future identity of the firm and for the job prospects of employees (Westhead, 1997). Finally, an IPO is often out of reach (Westhead, 1997).

A buyout, in contrast to other succession routes, has some advantages. First, it provides the opportunity to realise the owner's investment and ensures the continued independent ownership of the firm (Westhead, 1997). Second, the majority of the management team may remain intact afterwards, for example in case of a management buyout (Wright & Coyne, 1985) and implicit contracts with employees continue (Dyer, 2006). Finally, in case of a FOB, members of the family have the possibility to stay involved in the firm (Handler, 1994).

The goal of this study is to analyse the impact of the buyouts on the performance of a formerly FOB and to contrast it with the performance changes after a divisional buyout. One of the reasons why buyouts may lead to performance changes is the change in ownership of the target company. Before the buyout, the target is either an independent (often family owned) company or a division of a larger group. After the buyout, the managers are either sole owners of the company or co-owners together with private equity (PE) or institutional investors. This change in ownership may significantly affect post-buyout performance. The first studies on changes in performance after a buyout have been carried out in the United States in the 1980s. Although some of the early studies did not find a change in performance after the buyout (for example Ravenscraft and Scherer, 1987; Mueller, 1995; Andrade and Kaplan, 1988), most of the studies concluded that the post-buyout cash flow, profitability and productivity was significantly

higher than before the buyout (Kaplan, 1989; Lichtenberg en Siegel, 1989; Smith, 1990). None of the studies reported a negative impact of the buyout (Munari et al., 2006).

There are only a few studies on the performance of buyouts outside of the United States. Wright et al. (1992) document a significant improvement of the productivity and product development activities of buyouts that took place in the United Kingdom in the mid-1980s. In a follow-up study, they showed that the long-term performance of the buyouts significantly exceeded that of comparable non-buyout companies (Wright et al., 1997). Munari et al. (2006) show that the type of investor matters: UK buyouts backed by specialized PE investors tend to have higher profitability levels, although they find no different impact from specialized versus non-specialized PE investors on sales growth. Amess and Wright (2007), finally, document that leveraged buyouts in the United Kingdom in the early 2000s have a higher employment growth but a lower wage growth than cohorts in the same industry. Desbrières and Schatt (2002), however, find that the short-term post-buyout return on equity of French buyouts in the early 1990s deteriorates, compared with industry benchmarks.

In this study we analyse the post-buyout performance of 167 Belgian buyouts in the 1990s of which 43 are FOB buyouts. This in itself generates further insights into performance changes after buyouts in Continental Europe. A major contribution of this study is that we explicitly assess the impact of the type of change in ownership. We distinguish between different ownership structures before the buyout, namely FOBs versus divestments of corporates and after the buyout, namely buyouts without and with PE investors. We acknowledge that there are other types of pre-buyout ownership, namely a public corporation that is taken private in a buyout transaction, or a secondary buyout. Given that there were few public-to-private or secondary buyouts in Belgium in our study period, we ignore these sources of buyouts in the present study. In the post-buyout group, we further distinguish between PE-backed management buyouts, being transactions in which the management takes the initiative and invites a PE firm to co-invest, and investor-led buyouts (IBOs), being transactions in which the main initiator is a PE firm that allows managers to become shareholders. Despite the fact that previous empirical research does not make these distinctions, there are theoretical arguments to believe ownership structure may have a particularly important impact on post-buy-out performance. We further distinguish between different performance dimensions: growth, profitability and efficiency.

The paper is organised as follows. We first develop hypotheses on why we expect different ownership structure changes to have a different impact on post-buyout performance. Thereafter, the data collection method and sample are presented, followed by the results of multivariate analyses. The final section concludes and discusses the results.

THEORETICAL DEVELOPMENT AND DEVELOPMENT OF HYPOTHESES

One of the major drivers of enhanced performance is the fact that agency costs are reduced, as managers become owners of their company (Muscarella and Vetsuypens, 1990). Interests of owners and managers are hence more closely aligned, leading to real performance improvements. In order to fully understand why the performance of a company changes after a buyout, one has to consider why the buyout occurs, as pre-buyout agency costs are likely to be different in different situations. This has largely been ignored in the literature.

From the point of view of the seller, a buyout is an exit mechanism comparable to a merger. There are broadly two different sources of buyouts: the sale of a division of a corporate (hereafter: divisional buyout) or the sale of a whole company (hereafter: family firm buyout). In a divisional buyout, pre-buyout agency costs are high; divisional managers are usually not shareholders of the corporate. Further, divisions often have to bear a share of the central overhead and monitoring costs. In case these costs exceed the overhead costs of a stand-alone company, this creates important possibilities for efficiency improvements after a divisional buyout. Second, a buyout may be an exit mechanism for the owners of an independent company. In a family firm buyout, the owners are often private individuals – either the founding entrepreneur(s) or a next generation in family firms. Given the alignment of interests of owners and managers in family firms, pre-buyout agency costs are likely to be low (Jensen & Meckling, 1976; Dyer, 2006). There will hence be fewer possibilities for efficiency gains.

A second source of post-buyout performance improvement is the potential to redistribute wealth from stakeholders – especially employees – to shareholders (Amess and Wright, 2007). Owners and managers have implicit contracts with their employees with respect to employment and wages that may be discontinued due to the post-buyout ownership change (Lowenstein, 1985; Schleifer and Summers, 1988). These contracts tend to be stronger in entrepreneurial or

family firms than in corporates (Dyer, 2006). Family owners may negotiate that implicit contracts are respected post-buyout, while this will be less important in divisional buyouts. We hence expect that the discontinuities in the implicit contracts will be stronger in divisional buyouts than in family firm buyouts, leading to further efficiency improvements in divisional buyouts compared to family firm buyouts. Foregoing arguments lead to the following hypothesis:

Hypothesis1: Efficiency improvements will be more important in divisional buyouts than in family firm buyouts.

Buyouts are not only triggered by potential efficiency gains, but they are also a way to spur growth and innovation (Wright et al., 1992; Wright et al., 2000). It is well documented that older entrepreneurs or next family generations are less innovative, less growth oriented and more conservative in general (Wright et al., 2006; Westhead et al., 2001). Preservation of the wealth they have created is more important than exploring new wealth creation opportunities. When transferring ownership to the current management team, innovation and growth may again come to the forefront, explaining why buyout targets have higher growth rates. A divisional buyout may be driven by the fact that the division is not compatible with the core strategy of the corporate any more, or because the corporate is in financial difficulties and needs to restructure. Both situations lead to underinvestment in the target division. These restrictions are lifted after the buyout, leading to renewed opportunities for investment and growth. Hence, we expect that both divisional and family firm buyouts will significantly grow after the buyout.

Hypothesis 2: There is no difference in post-buyout growth between divisional and family firm buyouts

While some studies acknowledge the differential impact of different types of PE investors on post-buyout performance (e.g. Amess and Wright, 2007; Munari et al., 2006), we are not aware of any study comparing non-PE backed and PE-backed buyouts. We expect, however, significant differences in post-buyout evolution of both types of buyouts. PE investors are a special type of active financial investors, as they have specific value added skills (Sapienza et al., 1996). PE investors assist the management teams of their portfolio companies with financial and

strategic advice, they help in recruiting top managers and open their networks to benefit their portfolio companies (Sapienza et al., 1996; Wright et al., 2000). They will help in creating value through growth and innovation (Wright et al., 2006; Zahra, 1995). Moreover, PE financed buyouts will be less cash constrained than non-PE backed buyouts and hence be able to finance their investments more easily. Therefore:

Hypothesis 3: Buyouts financed with PE grow faster than buyouts financed without PE.

We further expect differences in efficiency improvement between PE-backed and non-PE backed buyouts. First, PE investors are specialised in monitoring their portfolio companies (Cotter and Peck, 2001) by requiring regular interim reports and audits (Beuselinck and Manigart, 2007). This will ensure that costs and investments are reduced to an optimal level. The strict monitoring should hence allow PE-backed companies to be more efficient than non-PE backed companies (Jensen, 1986; 1989). Second, the change in ownership structure results in a discontinuity in the implicit contracts that the old shareholders may have had with their employees, relating to employment and wage levels (Schleifer and Summers, 1988; Amess and Wright, 2007). This eases reorganisations and renegotiations with employees, redistributing wealth from employees to shareholders and enhancing shareholder value. The latter will especially be true when external private equity investors participate in the buyout. In a non-PE backed buyout, the old managers become the new owners, hence implicit contracts will remain and wealth redistribution between employees and shareholders will be more difficult to achieve. Especially in institutional buyouts, where the buyout initiative comes from institutional investors, contract renegotiations will be easier, leading to efficiency gains. Both the monitoring argument and the implicit contract argument lead to:

Hypothesis 4: Efficiency gains will be more important in buyouts financed with PE than in non-PE backed buyouts.

RESEARCH METHOD

Sample description

The sample comprises 167 Belgian buyouts that took place between 1996 and 2003. The buyouts are identified using several secondary sources of data, being Zephyr (Bureau van Dijk), the Centre for Management Buy-Out Research (Nottingham University), press releases of PE firms, newspapers and company websites. Given that there is no information on all buyouts in Belgium, we are not able to assess sample selection bias. Given our efforts to gather as much information as possible from different secondary sources, we are confident that we cover a significant part of the population of Belgian buyouts.

Table 1 gives an overview of the source of the buyouts and the ownership types of the sample companies. We distinguish between family firm buyouts and divisional buyouts on the one hand, and between non-PE backed buyouts and PE-backed buyouts on the other hand. We further split the latter category between institutional buyouts (IBOs), in which an institutional investor took the initiative for the buyout, and PE-backed management buyouts, in which the initiative came from the sellers or from the management, who invited a PE investor to co-invest. We refer to the latter category as PE-backed MBOs in the remainder of the text.

Insert Table 1 about here

Table 1 shows that 43 (26%) buyouts originate from a family firm divestment, while 93 (56%) originate from a divisional divestment. The divestment source of the remaining buyouts is unknown. 84 Buyouts, or 50%, are non-PE backed. This is surprisingly high, as most studies implicitly or explicitly assume that buyouts are financed with PE. Our sample hence indicates that an important part of the buyout population is not financed by PE, leading to biased samples when constructing the sample starting from PE firms. 72% of all family firm buyouts were financed by PE; half of those were IBOs. This compares to merely 40% of divisional buyouts being financed by PE. The PE-backed buyouts were mainly financed by local PE firms until 2000. From then on, international PE investors financed almost 30% of all buyout transactions in the sample. These are almost exclusively large investor-led buyouts.

Table 2 shows the characteristics of the sample companies in the year before the buyout (151 companies) or in the year of the buyout (16 companies). The pre-buyout information was not available for 16 companies that were not legally separate companies before the buy-out. In that case, the information in the year of the buyout was used as a starting point. Overall, there is a huge variation in the size of the buyout targets, leading to large differences between medians and the means. We hence report median values between brackets. A buyout target is, on average, 23 (median: 15) years old. There is no difference in age between the different types of buyouts.

Insert Table 2 about here

Family firm buyouts are larger than divisional buyouts in terms of assets and cash flow, while other size variables (sales, profits and number of employees) do not significantly differ between both groups. Non-PE backed buyouts are typically smaller than PE backed buyouts, as their size is constrained by the wealth of the management team and by the maximum leverage the firm can service (Jensen, 1989). Average sales of a buyout target amount to 31 million Euro (median: 14 million Euro), with PE-backed buyouts being significantly larger than non-PE backed buyouts. This pattern is present in all size related variables. The average number of employees of a buyout target is 122 (median: 60).

Finally, approximately a quarter of the buyouts are active in the industrial manufacturing sector and in the service sector each. The remainder is active in trade, construction and transportation among others.

Variables

The dependent variables relate to the post-buyout evolution, up to four years after the buyout transaction. This allows for a medium-term impact study, in line with previous studies (e.g. Desbrières and Schatt, 2002; Munari et al., 2006). Some firms remain for less than four years in the database, due to the fact that the transaction took place less than four years ago or due to the fact that the company does not exist as an independent entity any more. About fifty companies (28%) disappear for following reasons: twenty companies (12%) are taken over after on average four years after the buyout while another six (4%) are merged. Nineteen companies

(11%) failed and one company (less than 1%) is liquidated. Finally, three sample companies are introduced on the stock exchange. Firm-year data are gathered from the year before the buyout until at most four years after the buyout, leading to unbalanced panel data with 954 firm-year observations.

Firms' financial accounts that provide the data used in the empirical analyses are obtained from Belfirst. This is a database that is comprised of the financial accounts of *all* Belgian companies, as submitted to the Belgian National Bank. We focus on two dimensions of firm performance: growth and efficiency improvements. Firm growth is a multidimensional concept (Delmar et al., 2003). Hence, we measure relative growth along three important dimensions: total assets, sales (Munari et al., 2006) and employees (Kaplan, 1989; Muscarella and Vetsuypens, 1990; Amess and Wright, 2006). Firm efficiency is measured as profit margin (Muscarella and Vetsuypens, 1990), asset turnover and return on assets (Kaplan, 1989; Munari et al., 2006).

The independent variables are the source and type of buyout dummies, while the control variables include a size indicator to control for scale effects on economic post-buyout performance (log of total assets) (Kaplan, 1989; Munari et al., 2006). To consider the effects of previous performance, we included a profitability measure at the time of the buyout (EBITDA/sales) (Munari et al., 2006). We further included the age of the firm and post-buyout leverage. Leverage is included, as it is widely acknowledged that leverage serves as a disciplining mechanism for management and hence is positively associated with efficiency improvements (Jensen, 1986; Kaplan, 1989; Smith, 1990; Wright et al., 1997). In the employment model, we further include the average wage per employee as control variable (Amess and Wright, 2007). Finally, we included dummy variables "MBO Year i dummy" that takes the value of 1 in the i-th year after the buyout.

Methods of analysis

We first conduct bivariate analyses. We compare all the dependent variables of the different groups with non-parametric Kruskal-Wallis tests, as none of the dependent variables is normally distributed. We first compare the groups of family firm buyouts with divisional buyouts. We thereafter compare the groups of non-PE backed companies, PE backed MBOs and IBOs.

Further, each of the dependent variables is regressed on the independent and control variables using panel data analysis techniques. We used fixed effect panel data analyses with robust standard errors, as the goodness-of-fit statistics indicate that a fixed effect model is to be preferred compared to a random effects model.

EMPIRICAL RESULTS

Impact on growth

Table 3 shows the growth in sales, employees and total assets. The pre-buyout situation is compared with the post-buyout situation. Panel A shows the growth in the total sample, Panel B distinguishes between the source of the buyout and Panel C distinguishes between the funding type.

Insert Table 3 about here

Table 3 shows that, as a group, buyout firms grow significantly in terms of sales, employees and total assets (Panel A). Over a three year time period, sales grow on average with 21%, employees with 5% and total assets with 16%. Panel B suggests that family firm buyouts do not grow significantly more or less compared to divisional buyouts in terms of sales and total assets, which is consistent with Hypothesis 2. However, there appears to be a significant difference between the two groups in terms of employees. Hypothesis 3 is not supported, however: there is again no difference in average growth of non-PE backed buyouts and PE-backed buyouts, whether they are investor-led or not.

Table 4 shows the results of the multivariate panel data regression models, with as dependent variables the growth in total assets, sales and number of employees. First, family firm buyouts do not grow more or less than divisional buyouts, except for a marginally significant higher growth in total assets for family firm buyouts. This finding again confirms hypothesis 2. Second, PE-backed BOs (whether they are IBOs or not) have a significantly lower growth in total assets compared to non-PE backed BOs. PE-backed BOs, however, have significantly higher employee growth rates than either IBOs or non-PE backed BOs. There is no impact of the type of shareholder on sales growth. The multivariate analyses suggest that the different growth dimensions capture different effects and that the source of funding has a significant impact on firm growth.

Insert Table 4 about here

Impact on profitability and efficiency

Table 5 shows the results of the multivariate panel data regression models, with as dependent variables the efficiency variables, being the net profit margin, total asset turnover and return on assets. Bivariate analyses (not shown for space considerations) yield comparable results as multivariate analyses. The model explaining return on assets is not significant. Neither the source of the buyout (family firm versus divisional buyout) nor the funding type (non-PE backed, PE-backed MBO or IBO) have an impact on efficiency improvements, in contrast with hypotheses 1 and 4. We hence cannot conclude that the type of change in ownership has an impact on the post-buyout efficiency. The control variables yield some interesting observations. Return on assets is higher for larger firms (as measured by total assets) and lower for more profitable firms (as measured by EBITDA/sales). Higher leverage leads to higher return on assets, confirming the free cash flow theory (Jensen, 1989).

Insert Table 5 about here

DISCUSSION AND CONCLUSIONS

The goal of this paper was to analyse how the change in ownership after a management buyout influences changes in post-buyout efficiency and growth. While there is extensive Anglo-Saxon literature that shows that a buyout has a positive impact on firm performance, the impact of the heterogeneity of shareholder changes on post-buyout firm performance has been largely ignored until now. This issue is, however, non trivial as buyouts may originate from different types of governance structures, such as FOBs or divisional spin-offs. Further, a firm may be fully owned by the management after the buyout, or ownership may be shared among managers and PE investors, or managers may be the sole shareholders. Combining pre-buyout and post-buyout heterogeneity in shareholder and governance structures creates four types of potential changes in ownership and governance. This study explicitly acknowledges this heterogeneity in changes in governance structures.

We study foregoing questions by analysing the four-year post-buyout growth and efficiency of a sample of 167 Belgian companies that did a buyout between 1996 and 2003 of which 43 were FOBs. Consistent with our hypothesis, the source of a buyout has no impact on post-buyout growth, but the post-buyout ownership type has. PE-backed buyouts grow significantly more in employees, but less in assets, while there is no impact of ownership type on sales growth. This shows that post-buyout growth is not unidimensional and that the type of investor has an impact on the different growth dimensions. PE-backed buyouts grow less in assets, showing that they may be more reluctant to invest in this type of resources. These companies, however, invest more in employees, which represents a different type of resource. Combining both yields no difference in sales growth, however. Finally, the type of ownership change has no impact on efficiency improvement, in contrast with our hypotheses.

Our findings highlight that buyouts are an efficient way to transfer FOBs. Our findings, however do not confirm the generally accepted view of the impact of PE on their portfolio firm performance. The fact that there is a change in ownership is in itself positive and leads to value creation, whether or not PE investors are involved in the transaction. The resources that PE investors bring to a company are hence much less important in buyouts than in early stage companies. It would be interesting to extend our analyses to other countries, as our single-

country setting raises some concerns as to the generalizability of our findings. It might be, for example, that PE investors in more mature markets such as the U.K. or the U.S. are able to add more value to their portfolio companies.

We further call for studies on more types of ownership changes, for example management buy-ins, public-to-private transactions or secondary buy-outs. Given the limited number of this type of transactions in Belgium, we were not able to assess them. Finally, we did not consider the specific resources of a PE firm. We acknowledge that the heterogeneity of a PE firm, for example in terms of industry and stage specialization, or in terms of human and social resources, may have a considerable impact on the nature and efficiency of their involvement (e.g. Munari et al., 2006). Given data unavailability, we ignored this source of heterogeneity. Further research is hence needed in this area.

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TABLE 1:

The source and ownership type in buyout sample firms (N=167)

	Total	**Non-PE backed MBO**	**PE-backed MBO**	**Investor-led BO**
Family & private firm	43	12	16	15
Divisional buyout	93	56	25	12
Local firm divestment	*42*	*22*	*12*	*8*
Other European divestment	*33*	*26*	*7*	*0*
Other overseas divestment	*2*	*0*	*1*	*1*
UK divestment	*12*	*7*	*3*	*2*
N. American divestment	*4*	*1*	*2*	*1*
Secondary buy-out	3	0	2	1
Others and unknown	28	16	4	8
Total	167	84	47	36

TABLE 2:

Pre-buyout sample characteristics

		Total (N = 167)	**Family firm buyout (N = 43)**	**Divisional buyout (N = 93)**	**Non-PE backed MBO (N = 84)**	**PE-backed MBO (N = 47)**	**Investor-led BO (N = 36)**
Age	Mean	23	23	24	23	22	24
	Median	15	15	16	15	17	14
	Stdev	(24)	(58)	(24)	(23)	(29)	(29)
Sales	Mean	31,510	29,209	32,646	20,515	53,990	25,725
	Median	13,841	18,311	13,665	12,223	1,984	10,705
	Stdev	(53,209)	(34,017)	(56,551)	(27329)	(82,686)	(36,114)
Total assets	Mean	34,119	47,928	28,070	20,826	52,629	40,268
	Median	7,807	14,829	6,793	5,855	15,706	7,797
	Stdev	(90,819)	(133,100)	(63,309)	(87,739)	(98,951)	(84,237)
Cash flow	Mean	659	1,288	195	208	960	1,253
	Median	395	932	366	316	885	376
	Stdev	(6,507)	(3,618)	(8,003)	(4,573)	(10,043)	(3,691)
Profit	Mean	30,387	27,964	31,233	18,910	46,057	35,538
	Median	13,926	19,310	13,734	9,863	19,249	17,918
	Stdev	(51,670)	(32,346)	(54,456)	(30,779)	(71,172)	(53,943)
# employees	Mean	122	116	128	90	175	118
	Median	60	76	64	45	81	58
	Stdev	(182)	(139)	(189)	(129)	(259)	(128)

Financial figures are in €'000

TABLE 3:

Growth after a buyout: percentage change

		Panel A			Panel B			Panel C			
Variable	From to	N	Total	P-value*	Family	Divisional	P-value**	non-PE BO	PE-BO	IBO	P-value**
Sales	-1 to +1	114	6.77	0.01	11.86	3.42	0.32	4.97	6.15	9.18	0.60
	-1 to +2	110	9.64	0.00	18.26	8.46	0.28	6.63	9.64	18.67	0.50
	-1 to +3	92	21.29	0.00	26.04	21.50	0.64	21.50	6.84	26.68	0.64
Employees	-1 to +1	118	0	0.48	4.27	-2.63	0.03	-2.21	0	1.13	0.30
	-1 to +2	116	0	0.34	9.37	-0.89	0.01	-6.10	7.31	1.14	0.19
	-1 to +3	95	5.28	0.12	20.93	-2.44	0.06	-6.42	10.88	13.28	0.25
Assets	-1 to +1	134	6.42	0.01	8.04	4.02	0.59	5.36	16.91	0.42	0.12
	-1 to +2	132	9.63	0.01	6.37	18.75	0.63	10.96	22.53	-0.38	0.15
	-1 to +3	109	16.14	0.00	19.48	18.37	0.64	12.33	42.16	11.98	0.31

* P-value of the Wilcoxon signed-rank test for difference from zero

** P-value of the Kruskal-Wallis test for differences between groups

TABLE 4:

Fixed effects panel data regression on growth variables

	1		2		3	
Dependent variable	**Total assets growth**		**Sales growth**		**Growth in number of employees**	
Independent variables	**Estimate**	**S.D.**	**Estimate**	**S.D.**	**Estimate**	**S.D.**
Family buyout dummy	0.34†	0.18	0.0(	0.09	-0.13	0.13
Divestment buyout dummy	0.1(	0.13	-0.01	0.07	-0.08	0.11
PE-backed BO year 1 dummy	-0.36†	0.19	-0.05	0.10	0.36†	0.20
PE-backed BO year 2 dummy	-0.38†	0.19	0.0	0.09	0.54*	0.26
PE-backed BO year 3 dummy	-0.44*	0.22	-0.04	0.09	0.62*	0.30
IBO year 1 dummy	-0.22	0.14	0.1	0.18	0.19	0.17
IBO year 2 dummy	-0.33*	0.15	0.0	0.11	0.24	0.21
IBO year 3 dummy	-0.45*	0.20	-0.12	0.15	0.31	0.26
MBO year 1 dummy	-0.31*	0.13	0.0	0.10	0.15	0.16
MBO year 2 dummy	-0.19	0.23	-0.02	0.08	0.29	0.20
MBO year 3 dummy	-0.13	0.18	0.15†	0.08	0.45†	0.25
Log (total assets)	-0.85***	0.14	0.01	0.08	-0.21*	0.09
EBITDA / sales	0.02*	0.01	-0.03†	0.02	0.00	0.01
Leverage	-0.23	0.18	-0.23	0.37	-0.14	0.18
Age firm	0.0(	0.04	-0.05	0.03	-0.09*	0.04
Average wage					0.00	0.00
Observations	954		954		879	
Groups	222		222		212	
Significance of the model	$p < 0.001$		$p = 0.04$		$p = 0.0012$	
Overall r-square	0.0084		0.0587		0.0010	
Within r-square	0.1542		0.0120		0.0715	

*** $p < 0.001$

** $p < 0.01$

* $p < 0.05$

† $p < 0.10$

TABLE 5:

Fixed effects panel data regressions on efficiency variables

	4		5		6	
Dependent variable	**Total asset turnover**		**Return on assets**		**Net profit margin**	
Independent variables	**Estimate**	**S.D.**	**Estimate**	**S.D.**	**Estimate**	**S.D.**
Family buyout dummy	-0.07	0.13	-0.05	0.03	0.1	0.0
Divestment buyout dummy	-0.03	0.11	-0.03	0.03	-0.0	0.0
PE-backed MBO year 1 dummy	-0.04	0.15	-0.04	0.04	0.0	0.1
PE-backed MBO year 2 dummy	-0.13	0.14	-0.03	0.03	-0.0	0.0
PE-backed MBO year 3 dummy	0.08	0.23	0.00	0.04	0.1	0.1
IBO year 1 dummy	0.04	0.10	0.01	0.03	-0.0	0.0
IBO year 2 dummy	-0.08	0.14	-0.05	0.06	-0.0	0.1
IBO year 3 dummy	-0.15	0.17	0.00	0.06	0.6	0.5
MBO year 1 dummy	-0.06	0.12	0.05	0.04	0.0	0.0
MBO year 2 dummy	-0.08	0.12	0.04	0.03	-0.0	0.1
MBO year 3 dummy	-0.18	0.18	0.01	0.02	-0.0	0.1
Log (total assets)	0.73***	0.12	-0.04	0.03	-0.2	0.2
EBITDA / sales	-0.03**	0.01	0.01	0.01	0.0	0.0
Leverage	-0.22	0.23	0.19*	0.10	0.5	0.5
Age firm	-0.02	0.03	0.01†	0.01	0.0	0.0
Average wage						
Observations	954		954		954	
Groups	222		222		222	
Sig. Model	$p < 0.001$		$p = 0.0015$		$p = 0.3569$	
Overall r-square	0.0016		0.003		0.0168	
Within r-square	0.0544		0.0422		0.1023	

*** $p < 0.001$

** $p < 0.01$

* $p < 0.05$

† $p < 0.10$