

ERKKI NIKOSKELAINEN*

The Operating Characteristics of Leveraged Buyouts: Empirical Evidence from Europe

ABSTRACT

This study examines the operating performance and characteristics of leveraged buyouts in Europe. Using a sample of LBOs, matched control groups of comparable companies as well as industry matched strategic acquisitions, the results indicate that there exists a significant relationship between the operating characteristics of a company and the likelihood of LBO. The presented evidence is interpreted as inconsistent with the notion that agency problems associated with free cash flow would be the main driver for LBO activity. This inconsistency is assumed to reflect the competitive and capital market changes impacting LBO activity. Although not conclusive, the evidence justifies support for the presented underperformance hypothesis.

Key words: Leveraged buyout, LBO, MBO, free cash flow, private equity
JEL classification: G3, G34

1. INTRODUCTION

The European private equity mergers and acquisitions (M&A) market has grown to double the size of the corresponding market in the US. In the first three quarters of the year 2003 Europe has

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comprised over 63 percent of the global private equity M&A market. Main reasons for the recent growth in Europe are the large supply of suitable assets for financial sponsors and the need for corporate restructurings.¹ The size of the total European private equity market in 2002 was USD 26 billion, of which 62 percent (USD 16 billions) represented leverage buyouts, an increase of 65% from 2001.²

Despite the increasing importance of the European buyout market, academic studies on buyouts focusing in the European region have been few. UK is the biggest buyout market in Europe and it has been the centre of attention in European buyout studies. Kitching (1989) compares UK and US LBO returns. Wright (1991) assesses debt, equity and agency cost implications of management buyouts (MBOs) in UK. Saadouni, Mallin & Briston (1995) studied stock returns in the UK after MBO announcement and find that MBO divestments in the UK are associated with negative abnormal returns. Amess (2002) studies how MBOs change the level of productivity in UK manufacturing firms. He provides empirical evidence that MBO governance structure creates managerial incentives that improve firm-level performance. Jelic, Saadouni & Wright (2002) examine financial performance, and venture capital involvement in UK MBOs exiting through IPOs and find no evidence that venture backed reverse MBOs subsequently outperform non-venture backed MBOs on return basis. Finally, Desbrières & Schatt (2002) investigate the financial characteristics and changes in performance of French companies involved in a leveraged buyout. The empirical study shows that the acquired firms outperform their counterparts in the same industry sector before and after the buyout. However, unlike findings concerning LBOs in the USA and the UK, the performance of French firms falls after the LBO is completed.

The growth of the LBO markets emphasises the important role financial sponsors have in restructuring and developing companies. Private equity investors are usually seeking investment opportunities outside of the interest areas of industrial buyers. In addition, the lack of interested strategic buyer candidates for certain assets and companies often leaves financial sponsors as the only group of potential acquirers.

LBO targets are often non-core assets of larger corporations. Companies that have multiple subsidiaries may have businesses that no longer fit with their core objectives. In addition, smaller divisions or units of larger corporations can lack the attention necessary to maximize their potential. Therefore, for the parent company disposal of such divisions allows allocation of resources to core businesses. Another common reason for the sale of a business is that owners want to retire and there are no family members who want to take over the business. Confronted with the decision to sell to a competitor, the owner can either suggest an MBO to the management

¹ Financial Times, 17–Nov-03, "Europe eclipses US in the M&A stakes"

² PriceWaterHouseCoopers & 3i, "Global Private Equity in 2002".

team or approach a financial sponsor to see if they have an interest in purchasing the business. Recent studies show that a significant proportion of LBO targets in Europe are family businesses (Desbrières & Schatt, 2002).

There can be regulatory reasons why financial buyers are suitable acquirer candidates. With the continued consolidation in many industries regulatory authorities are faced with the objective of maintaining a competitive business environment. In some cases regulators have ordered companies to divest assets in particular markets where the divesting company has had too dominant market position. Generally, regulators require sale to a qualified buyer who will continue to run a competitive business and therefore maintain competition in the marketplace. In this type of situations financial sponsors can present themselves as viable options.

The purpose of this study is to examine the identification of typical operating characteristics of European buyout targets. Using a sample of 71 LBOs, this study determines the operating performance and characteristics of leveraged buyouts in Europe during the period 1997–2003. The LBO sample is compared to 71 matched control groups of comparable companies as well as to a sample of 685 industry sub sector matched strategic mergers and acquisitions announced during the same time period as the sample LBOs.

This study makes three contributions. First, this paper addresses the significant changes in both the capital markets and in the competitive landscape of financial sponsors. The lending market has consolidated and the competition among financial sponsors has intensified given both the larger number of sponsors as well as the high amount of uninvested capital in buyout funds. As a result, LBOs are often targeting companies at earlier stages in the lifecycle, which requires more operational expertise to create value. These changes have transformed the dynamics of the LBO markets. The competitive forces framework of the industry presented by Wright and Robbie (1998) is addressed. Hypothesis relating to market dynamics and increased competition are developed and evidence is provided how rivalry between firms, power of suppliers and power of customers of the framework have impacted the characteristics of LBO markets.

Second, this paper adds to previous research on pre buyout characteristics of LBO targets. The studies of Lehn & Poulsen (1989), Singh (1990) and Opler & Titman (1991) are extended by comparing the operating characteristics of LBOs to both comparable industry peers (control group) as well as to strategic mergers and acquisitions. Prior studies compare LBOs only to a control group of comparable companies and thereby violate the exclusion of relevant alternative assumptions in research design. Additionally, a rigorous comparable company selection process extends prior research. Prior pre buyout research is also extended by evidence of both short and medium-term operating performance of LBO targets. The tested variables control for the use and generation of cash flow, assets and capital structure as well as operating efficiency and growth. Based on multiyear observation, the presented results highlight the typical characteristics of LBO

targets. Thereby, the typical bias of short-term variables caused by transaction negotiations can be controlled.

Third, this paper contributes to research on European LBOs by studying pre buyout operating characteristics using a sample of European LBOs. There is a notable lack of European pre buyout research. The empirical studies of European LBOs have focused on firm level effects during the post buyout period (Kitching, 1989; Wright, 1991; Amess, 2002 and Desbrières & Schatt, 2002), stock market reactions on MBO announcements (Saadouni et al., 1995) and on the aftermarket performance of IPO companies that are previous MBOs (Jelic et al., 2002).

The remainder of this paper is organised as follows. Section two reviews the existing theories of LBO value creation and discusses the relevant issues related to capital markets and LBO markets. Section three describes the sample selection process and the research methodology is discussed. Section four reports the empirical results and section five concludes the study.

2. THEORY AND HYPOTHESIS

Improved operating efficiency is viewed as one of the main drivers of increased value after LBO. Improvements are reached through cutting of costs, refocusing of operative resources and reducing capital requirements. Numerous studies have documented post buyout improvements in operations of LBO companies. Kaplan (1989), Bull (1989), Hall (1990), Lichtenberg & Siegel (1990), Muscarella & Vetsuypens (1990), Opler (1992), Long & Ravenscraft (1993), Ofek (1994), Wright et al. (2001) and Desbrières & Schatt (2002) have provided evidence of cost cutting and improved margins after buyout. Easterwood et al. (1989), Singh (1990), Smith (1990), Long & Ravenscraft (1993b) and Holthausen & Larcker (1996) have found proof for reduction in capital requirements after buyouts. One stream of buyout literature has documented that improved operating efficiency is linked to specific operating decisions made by the new owners after LBO. Chevalier (1995) finds that supermarkets that have been acquired through an LBO and therefore are highly leveraged, face a greater threat of entry and price competition. Additionally, LBO firms tend to have higher prices than their less leveraged competitors. Furthermore, Ambrose & Winter (1992) study if an industry effect would be better explanation for LBO likelihood than company specific factors and conclude that company specific factors are the primary drivers of LBO probability. Consistent with these results and inline with Kaplan (1989) are the finding by Kovenock & Phillips (1997) who show that firms that significantly increase their use of debt in an LBO are more likely to close plants and reduce investment than their rivals.

The dominant paradigm in corporate finance for the improved efficiency and value generation in LBOs is Jensen's (Jensen, 1986) theory that LBO firms suffer from agency problems of free cash flow. These agency problems form a conflict between managers and shareholders, since free

cash is not profitably invested in the company. According to Jensen, the absence of acceptable investments, or the unwillingness of the managers to make investment decisions should result in distribution of the excess funds to shareholders. The free cash flow theory states that LBOs realign the incentives of the management, which reduces agency costs and improves efficiency. Support for agency costs of free cash flow and realignment of incentives have been found by a number of studies like for example Lehn & Poulsen (1989), Kaplan (1989), Smith (1990), Opler & Titman (1993) Muscarella & Vetsuypens (1990), Cotter & Peck (2001) and Bruton et al. (2002). Opler & Titman (1993) refer in their research to financial distress theory, which has not gained ground in majority of LBO studies.

In the 1980s and early 1990s another common explanation for the improved efficiency in LBOs was the private information hypothesis. This applies mainly to MBOs, as it states that managers have private and superior information about the future and current state of the company, and therefore they view buyout as a favourable option. Private information hypothesis has been one of the focus areas of early MBO studies (for example DeAngelo et al., 1984; DeAngelo, 1986; Hite & Vetsuypens, 1989) with emphasis on the wealth transfer from the shareholders to the MBO participants. These studies (along with Lee, 1992 and Singh, 1990) have concluded that in practice favourable inside information may be a motivator for the management to propose an MBO, but private information is not an exclusive reason for these transactions.

Early LBO studies argued that taxes are one of the key sources of value creation in LBOs. Corporate tax savings were reported to have a significant role in the LBO process. Lowenstein (1985), Bull (1989), Kaplan (1989) and Singh (1990) provide evidence on tax incentives in LBOs. Singh (1990) shows that the increase in debt makes high tax deductible interest payments necessary and provides a tax shield with a positive impact on cash flows. Although it is widely acknowledged that significant tax benefits accrue from going private, many reject Lowenstein's (1985, 1986) proposition that the exploitation of tax benefits is the most important motivation behind buyout transactions mainly because such large borrowings could also be undertaken while the firm is still public, as in the case of leveraged recapitalisations. According to Opler & Titman (1993) there must be some non-tax-related reasons for using debt in LBOs' such as reduced agency costs, through the reduction in the level of free cash flows at the disposal of management and improved monitoring role played by the debt holders. Opler & Titman's (1993) arguments are supported by earlier findings of Opler (1993), who found that many of the firms in his sample took on much more debt than was required to eliminate their taxable earnings and that approximately 50% of those same companies paid no income tax after going private. In addition, if the tax benefits of debt were the only motivator for undergoing an LBO, the degree of leverage would not have been reduced as significantly in the post buyout period as they have been shown to be (Hite & Owers, 1983).

Academic research around LBOs (and MBOs) has been very focused in post buyout value creation and governance structure. Little emphasis has been put on the pre buyout stage of LBO targets, and the value creation potential these companies would have without going through an LBO. The wealth of the shareholders of a LBO target is not maximised if there is unused value potential in the company that is not reflected in the sale value. Studying the pre buyout stage of LBO targets provides information on whether the post buyout value improvement is caused by a wealth transfer from the existing shareholders to the acquirers or by improved operating efficiency. Holthausen & Larcker (1996) address this issue in their research on reverse leveraged buyouts.³ They question the feasibility of linking incentives and organisational structure to performance. A number of LBO studies conclude that financial performance improves after performing a buyout. However, it is much more problematic to conclude that the shift in organisational incentives causes the improved performance. Halpern, Kieschnick & Rotenberg (1999) provide evidence that support this argument. Their research shows that there are two types of LBO companies: those where management has insignificant equity stake in the company, and LBOs where management owns a significant portion of their firms stock. For the latter group, the incentive argument cannot alone explain the willingness for an LBO or the value creation in the post buyout period.

Holthausen & Larcker's (1996) line of reasoning introduces a relevant academic aspect considering buyouts. It can be argued that LBO targets are underperformers and this underperformance cannot be entirely explained with the free cash flow and insider information hypotheses. Reasons for such underperformance could be incompetent management team, managerial mistakes or organisational problems that have led to inefficiencies and unoptimised value destroying strategic actions. Another reason for such performance can be related to areas of corporate governance. Monitoring of top management can lead to inflexible and too formal reporting and decision-making process. Baker & Wruck (1989) state that an improvement in the nature of decision-making and implementing process for management can improve the performance of a company significantly.

A company that underperforms its industry peers can be identified without privileged information of the firm. This kind of underperformer, if it generates sufficient cash flow and has lower Tobin's Q⁴ than its peers, would make an attractive LBO target. Improving operating performance of such company would provide value creation potential through optimisation of cost structure and resources. On the other hand this value potential could be obtained without going through LBO, if the company would take action to address these problems.

³ Reverse leveraged buyout is a process of bringing back into publicly traded status a company or a division of a company that had been publicly traded before and taken private in leveraged buyout.

⁴ Tobin's Q is defined as market value of total assets divided by book value of total assets.

Based on this theoretical discussion, a new hypothesis can be introduced for the value creation in LBOs. The underperformance hypothesis states that a company becomes an attractive LBO target because the company should be able to improve its operating efficiency and cut unnecessary capital spending. An underperforming company can be defined as a company that underperforms its comparable industry peers because it is unable to optimise resources between growth, capital requirements and operating costs. The main assumptions behind this hypothesis are that companies with similar business model and size within the same industry sub sector and market should have similar growth prospects (similar access to capital, similar market growth, similar market valuation), similar cost structure and similar operating efficiency. If all of these assumptions hold for a group of companies, then they should all be either attractive LBO targets or not attractive LBO targets. However, often there are comparable companies acting in the same market and yet they have not all chosen the same option. Some have stayed public, and some have chosen the LBO route.

The characteristics of the underperformance hypothesis are similar to those of the insider information hypothesis. However, the underperformance hypothesis states that the underperformance can be recognised with publicly available information of a company. According to insider information hypothesis, a buyout is an attractive option for the transaction parties possessing privileged information.

There are fundamental differences between the free cash flow and underperformance hypothesis. The former identifies an absolute state where LBO is a preferred choice, whereas the latter approaches LBO probability from a relative perspective. Firstly, agency costs of free cash flow arise when a company creates substantial free cash flow in excess of that required for funding all positive net present value projects. This is not assumed in the underperformance hypothesis that only views the relative ability to generate cash flow. Secondly, according to the free cash flow hypothesis the control function of debt is more important in companies that generate significant free cash flows but have low growth prospects. The absence of positive net present value investments creates the agency problems. The underperformance hypothesis does not assume low growth prospects. Lower growth than that of comparable companies is viewed as evidence of inability to exercise growth options at any level of growth. The underperformance hypothesis does not account for incentives, which usually play an important role in the value creation during the post buyout period. However, incentives are only one of the three main elements of the free cash flow theory (disciplinary effect of debt, incentives and monitoring). Underperformance hypothesis will hold if the company is unable to exploit existing growth opportunities or lags the performance levels of its industry peers because, the benchmark companies and the buyout targets can be assumed to have incentive structures not far from each other before the buyout transaction.

In a theoretical situation where a company generates significantly less free cash flow and has notably slower growth than its perfectly comparable industry peers the underperformance hypothesis holds, but the free cash flow hypothesis does not. It does not hold because it can be assumed that the growth of comparable companies is a result of existing positive net present value projects and yet without investments in growth the company is not generating similar free cash flow to its comparable peers. It should also be noted, that according to Jensen (1986), agency costs of free cash flow arise after the cash is generated and is not used for maximising shareholder wealth. Hence, the free cash flow theory does not assume whether or not cash generation is maximised with current operations. Given that agency costs impact managerial decisions on the usage of the generated cash, a further assumption is that the company could, through more efficient usage of resources, generate more cash with its operations.

Even when all of the underperformance hypothesis assumptions hold, companies choose to take different future directions: some stay public, some are acquired and some go through an LBO. The main reason for this is likely to be rooted to the development of the LBO market and relevant capital markets.

2.1. Development of LBO and capital markets

LBO markets have gone through a dramatic growth since the introduction of the dominant LBO theories in the 1980s. The rapid growth of buyout funds has increased the buyout activity and today the markets both in the US and in Europe are very competitive. Price increasing auctions surrounding sales of cash cow businesses have forced financial sponsors to evaluate more opportunistic buyouts. In addition, during times of market slowdown, financial sponsors are always looking for investment opportunities, whereas for specific assets there might not be any potential industrial buyers. Challenging market conditions drive industrial buyers focus on improvements of operations, restructurings and streamlining of businesses.

Over the past decade the European private equity market has developed considerably. US private equity investors who were seeking investment opportunities within Europe initiated the growth of the market. European based private equity vendors who boosted the European private equity fundraising soon followed them. Favourable market conditions assured the supply of capital to buyout funds, resulting in increased competition for buyout targets in Europe.

The main catalysts in the development of the private equity industry in both Europe and the US occurred in the 1970s. The Competition and Credit Control policy in 1971 gave UK financial institutions more flexibility in investment decisions. A number of the limitations placed on institutional pension funds in the US were removed with the clarification of the "prudent man" rule. This allowed these institutions to invest in alternative assets. Moreover, additional legal and structural changes in Europe were catalysts to the private equity market. The most important ones

being regulation changes for pension funds and insurance companies as well as tax reforms that made capital gains attractive for investors. The rapid growth of the European private equity market began in 1990s. As a result of the low inflation levels capital was transferred from fixed income securities to equities. Large number of institutional investors became attracted to the return potential of the private equity market and its stable and maturing position as an investment alternative. In Europe, the biggest suppliers of funds to private equity are banks, insurance companies and pension funds. They accounted for 58% of the European private equity funds between 1998–2002.⁵

Most studies on LBOs have researched the US market in the 1980s. Since then the buyout markets and capital markets both in the US and Europe have changed radically. The lending market is different due to consolidation among the providers of debt. Hence, today there is considerably smaller number of debt providers there was in the 1980s. Financial engineering skills are these days a commodity that no longer provide special opportunities for selected investors. At the moment in both US and European markets there is a high amount of uninvested capital in LBO funds that have raised capital. These funds are trying to seek suitable investments in order to gain return for raised funds.

Equally important, the US and European competitive landscape in LBO markets has changed. The LBO market is truly global with funds typically seeking attractive LBO targets worldwide. Large number of entrants in the market has consequently increased the competition for investment opportunities. Resulting from the intensified competition most sell processes today are done through auctions instead of targeted sell offers to well connected private equity companies. Accessible auctions attract more bidders, which leads to more accurate pricing. This reduces the previously existed opportunity of undervaluing LBO target companies. Search for LBO opportunities has also led to transactions being targeted on companies at earlier stages in the lifecycle. LBO returns are affected by the risk profiles of the providers of debt. Gearing levels (percentage of debt in initial capital structure) are lower than they used to be and interest coverage ratios have moved up. These changes have reshaped the dynamics of LBO markets. According to Harper & Schneider (2004) the business model of buyout funds has to be changed as a result of the changed competitive landscape and convergence of market forces.

Altogether, the changes in capital markets and increased competitive environment can have affected the characteristics of LBO target companies. High values of optimal targets and desperate seek for LBO investments allow to question the notion that agency problems associated with free cash flow are the main driver of LBO activity. Consequently, the underperformance hypothesis can explain more of the characteristics of buyout targets in the maturing LBO markets.

5 Source: European Venture Capital Association, www.evca.com

3. DATA AND METHODOLOGY

3.1. Sample selection

The sample used in this study consists of 71 LBOs, 71 matched peer groups and 685 strategic mergers and acquisitions. The time period of this study is from January 1997 to June 2003. The selection of the sample subgroups, and the study period are discussed in this chapter.

The LBO subgroup consists of buyout transactions announced in Europe between January 1997 and June 2003. The main assumption in the sample selection process is that the LBO environment in different European countries would be the same. Hence, differences in for example legislation and capital markets are not accounted for although European studies LBO studies have shown different results within different countries (eg. Desbrières & Schatt, 2002). However, studies focusing on individual European countries usually have special data not accessible to other authors. In order ensure respectable sample size in the present research the assumption is made that there LBO targets in different parts of Europe share similar fundamental characteristics relevant to the aim of this study. The source for the LBO data is the SDC Platinum database that consists of 1591 European LBOs announced in the test period. These are European targets with transaction value (deal value) available. These LBOs were identified using the SDC Platinum code (LBO flag), which comprises LBOs (including private and public to private LBOs), MBOs as well as secondary buyouts. Secondary buyout is an exit mechanism where one private equity firm sells its ownership to another private equity firm. The final sample was selected by firstly eliminating transactions with deal value less than USD 30 million (745 LBOs). Small LBOs can present outliers in the sample as these can have exceptional characteristics that can distort empirical results. Especially in situations where the transaction value reflects severe problems experienced by the company, for example companies in financial distress and in bankruptcy protection. In these situations the operating characteristics are significantly biased because of the financial situation and therefore these LBOs do not represent a normal case of a buyout transaction. For the same reason transactions with negative cash flows in the twelve months prior to LBO announcement were excluded (16 LBOs). For 71 individual LBO transactions the data for calculating all of the tested variables was available of the remaining amount of LBOs (830 LBOs). 38 of these LBOs in the final sample can classified as management buyouts (MBOs), as the acquirer in these transactions included the management of the target company. The LBO sample becomes small due to the exclusion of exceptional LBOs and the use of longer-term variables and cash flow and balance sheet items. The main reason for this is that historical information up to three years prior to LBO is available for only 71 transactions. Likewise, cash flow and balance sheet items needed are available only for these LBOs. In order to test the effects of both short and long term operating characteristics as well as cash flow and balance sheet metrics, it is important that variable defini-

tions are not changed, although this would allow a significantly bigger LBO sample size. The use of only short-term variables can bias the analysis of operating characteristics significantly. This is mainly because buyout negotiations start many quarters before the buyout transaction takes place. During this time the owners and management of the company may wish to take actions that improve their position in negotiations. Additionally, buyer's evaluation of a LBO target is based on multiyear performance analysis. 51 of the sample LBOs are public-to-private transactions, meaning that the LBO target is a public company that is taken private. Given the reporting requirements of public companies, there is generally more data available for them, than for private companies, subsidiaries or divisions of corporations.

A matched peer group was constructed for each of the sample LBOs. Each peer group consist of 5 comparable companies and each of the peer group variable values is an average value for a 5-company peer group. Since test variables for LBOs were calculated for the twelve months prior to announcement date (annual figures) the peer group variables were calculated for the period matching this 12 months period prior to the corresponding LBO announcement. Thus, two-year growth variable is matched for the 24 months prior to LBO announcement. This was done by calendarising the annual reported financials to the 12 months ending at the end of the corresponding LBOs announcement month.⁶ This eliminates the problems arising from different fiscal year ends as well as from possible industry cyclicity. The usage of annual financial figures can lead into look-ahead bias. However, since public companies announce quarterly financial reports, and equity research reports with forward looking estimated are available for evaluation of LBO targets, the look-ahead bias is not likely to present significant bias to the empirical tests.

A number of LBO studies have used peer groups (control groups) in order to measure the difference of operating variables and changes in the operating performance of LBO targets. Lehn & Poulsen (1989) used SIC industry code and equity market value matched control group for LBOs. Singh (1990) tested randomly selected 2 companies with matching SIC industry code in his study on characteristics of MBO targets. Simple SIC industry code matched control groups were used Smart & Waldfoegel (1984) study on effects of LBO restructuring, Ambrose & Winter (1992) research on industry effects of LBOs and Long & Ravenscarft (1993) study on changes in R&D intensity after LBO. Smith (1990) and Kaplan (1989) tested industry average variable adjustment based on SIC industry code in order to document post LBO improved operating performance.

Given that SIC industry code definitions are wide in terms of their coverage, the usage of SIC code based peer groups may give inaccurate results. Often these codes do not separate for

⁶ Example of calendarisation: A company reports a revenue of EUR 15,000 for fiscal year ending 31.12.2001 and a revenue of EUR 20,000 for fiscal year ending 31.12.2002. The calendarised revenue for 12 months ending for example at 31.5.2002 is calculated as follows: $(5/12 \times 20,000) + (7/12 \times 15,000)$.

example resellers and manufacturers in certain sub sectors, although these two business models have completely different operating characteristics. There is also evidence that SIC codes frequently misclassify companies (Kim & Ritter, 1999). Attempts for increasing the comparability of the peer companies have been introduced in the literature. Liebeskind et al. (1992) use three factors when choosing control firms: SIC code, size (in terms of revenues) and corporate focus (in terms of revenue breakdown).

The chosen process of forming peer groups in this research was to find 5 comparable companies matching 3 criteria with the corresponding LBO target. Firstly, the size in terms of revenue should be approximately the same, as in a number of industries there exists economies of scale that affect operating performance. Secondly, the business model and industry sub sector should be the same as the comparability of the operating performance and growth are linked to these. Finally, the peer group companies should be European and preferably acting in the same country as the LBO target in question. This provides comparable statistics of the growth and risk potential of the market. If enough companies were not found from the home market, the peer group was completed with companies based in other European countries. In most cases the peer group was completed with companies from other European countries, as the focus on company selection was on the comparability of the business model. The individual selection of the firms was done using Bloomberg Global Equities database that is also the source of financial information for the peer group companies used in this study. First the industry sectors of the companies were matched using Bloomberg industry codes (that correspond to SIC codes). Second the size of companies was matched, by using LBO revenues as a benchmark and eliminating companies that had over 100% higher revenues or less than 50% of the LBO target revenues. Finally, five best matching companies were selected from the remaining potential peers. This was done by careful qualitative analysis of the business descriptions of the companies. Following Kaplan (1989) and Smith (1990) the peer group financials are used for calculation of an industry average figure. Averaging the peer group eliminates deviations that may be caused by a number of factors and provides a solid comparable figure to be compared with corresponding LBO target. For example, use of average eliminates the effects of possible exceptionally good or bad years by one or more of the peer companies.

Kiesching (1998) criticises the methodology of Lehn & Poulsen (1989), one of the most frequently cited LBO studies, for failing to include firms that are acquired by other firms in their sample. Consequently, Kiesching (1998) states that Lehn & Poulsen (1989) do not account for all potentially relevant alternatives in the logistic regressions, and thereby violate the exclusion of relevant alternative assumptions of the logistic regression model. This critique applies equally to pre LBO studies of Singh (1990) and Opler & Titman (1991).

In order to draw conclusions of the nature of LBO companies, and to infer and examine

reasons for a company undergoing an LBO, the main strategic options of a company have to be evaluated and taken into consideration in the conducted tests. Basically, a public company has three options: to remain public, to be acquired by another company (or to be merged with another company) or to be taken private through a leverage buyout. Typical reasons for LBOs are discussed in the "Theory and hypothesis"-section and this section focuses on the differentiating characteristics of LBOs and strategic transactions. Strategic mergers and acquisitions can be defined as transactions that are executed due to strategic reasons on a going concern basis. Financial buyers acquire targets for a holding period in order to gain return on invested capital.

On a company level, the main difference between LBOs and strategic mergers and acquisitions lies on synergies. The vast majority of mergers and acquisitions rely on synergies, such as revenue and cost synergies or on scale reasons in the value creation. Other main reasons for M&A transactions are strategy related, like leveraging core competencies and accessing new markets. Only a small proportion of strategic transactions are undertaken for other than synergy or strategy reasons. For LBOs synergies or strategy rationale rarely exist, although it is possible for a financial sponsor to merge and combine portfolio companies (previous LBOs) that have synergy potential. Given the general absence of synergies, the characteristics and rationale behind strategic M&A transactions and LBOs should be different. Hence, the characteristics of targets undergoing one of these two options should be different. Another company-level difference of the two types of targets is the nature of assets and the potential of the company. Companies within industries that have neither significant growth nor consolidation potential are more likely to be targets of a buyout than a strategic transaction. Finally, the degree of diversification of companies affects the likelihood of a transaction type. Very diversified small targets may not be of interest to industrial buyers as they may not be willing to restructure the target to their needs whereas a buyout team could see an investment opportunity in potential divestment of unnecessary businesses and refocus of the core business of the target.

The different transaction rationale of strategic and financial buyers causes a different approach on the evaluation of the target. The strategic approach can allow for compromises between financial and qualitative characteristics, depending on the acquirers needs whereas the financial approach starts from the financials. The obvious reason for this is that unless the target satisfies certain financial conditions, a financial buyer cannot proceed with the acquisition since providers of debt demand certain conditions on lending ability of the target. Consequently, the financial characteristics of strategic transaction targets and buyout targets can be assumed to be different.

From the perspective of shareholders, the best option is the one that maximises the value of their investment. A transactional perspective of value maximisation favours sale to a strategic buyer, because they are likely to pay a higher price than financial buyers. Reason for this lies in synergies that acquiring companies have identified in targets. Therefore, LBO is not as favourable

choice as sale to a strategic buyer, if there exists an option to choose between the two alternatives.

The third subgroup of the sample in the present study consists of 685 strategic mergers and acquisitions. These transactions were identified from SDC Platinum database. The complete list of mergers and acquisitions with European targets announced between January 1997 and June 2003 consisted of over 15,000 targets. Firstly, transactions with deal value less than USD 30 million were eliminated. Secondly, only the targets from the same industry sub sectors as the LBO sample (21 sub sectors) were included (using SDC "Target TF Mid Description"). Thirdly, only transactions with sufficient data for calculating all of the tested variables were included. The resulting subgroup consisted of 685 mergers and acquisitions.

There are two reasons for choosing the time period 1997–2003 for this study. Most M&A databases have previously had a US focus with maintainers having less effort for detailed documentation of European transactions. Therefore, having a longer time period would not significantly increase the LBO sample size. The other reason, which partly explains the prior US focus, is the rapid growth of the European private equity industry as discussed in the introduction of this paper. The amount of European private equity investments has grown from EUR 5,55 billion in 1995 to EUR 27,6 billion in 2002. The peak of the market was in 2000 when EUR 35 billion was invested.⁷ Hence the post 1995 period is a very interesting period for studying European LBOs.

The geographic origin of the LBOs and strategic mergers and acquisitions is to some extent biased towards the UK: 48 of the LBOs and 228 of the strategic transaction are UK based. Second largest geographic group is France with 24 LBOs and 154 strategic transactions. Largest number of transactions was announced in year 1999: 21 LBOs and 184 strategic transactions.

3.2. Methodology

The rationale for the chosen methodology is to analyse if there are identifiable operating characteristics in buyout targets that differ from those of comparable public companies and targets for strategic mergers and acquisitions. The aim of the empirical design is to test the explanatory power of these characteristics in explaining the probability of a company going through an LBO. In addition, the purpose of the research design is to test to what extent this probability can be explained with the presented hypothesis: the free cash flow hypothesis, the insider information hypothesis and the underperformance hypothesis.

In terms of applied tests, the methodology of the present study follows by and large the lines of prior studies. Firstly, following Kaplan (1989) and Lehn & Poulsen (1989) the differences between LBOs and peer groups are tested using both paired t-tests for differences in means and Wilcoxon signed rank tests for differences in medians. Secondly, the variables are tested with

⁷ Source: European Venture Capital Association, www.evca.com

logit regression analysis for measuring the likelihood for LBO as a function of operating characteristics. This is done separately for LBOs and peer groups, LBOs and strategic mergers and acquisitions as well as for a pooled sample including LBOs, peer groups and strategic mergers and acquisitions. The dependent variable is a dummy variable that is given value one for LBO targets.

Variable selection is based on the assumed determinants of the likelihood of going private through an LBO. The chosen set of variables in this study is based on selected previous research as well as on variables that are seen as viable proxies for testing the free cash flow and the underperformance hypotheses. The variables are discussed below, with emphasis on typical characteristics of LBO targets.

Growth plays a significant role in determining buyout targets. Mature businesses with low growth are common buyout targets, as these businesses are more attractive investments from debt providers' point of view given the lower level of risk associated with these companies. Slow growth may also indicate inefficiency in exploring growth options. Growth is related to operating efficiency, as in industries with static or negative growth the strategic focus has often shifted towards improving capital productivity and rationalisation of business operations. In theory, a company's inability to improve efficiency in times of slow growth would support the underperformance hypothesis and reflect management's unwillingness to make difficult cost cutting decisions. Growth variables have been tested in previous studies by Singh (1990), Lehn & Poulsen (1989) as well as Muscarella & Vetsuypens (1990).

Cash flow generation and volatility of cash flows are key variables for testing the free cash hypothesis, since agency problems related to inefficiency can only arise when cash is being generated. The free cash flow hypothesis can also be interpreted in the way that agency problems arising from low leverage can lead to increased volatility in cash flows. In practice, for an LBO to be a viable option a company has to be able to generate sufficient cash flow for serving the debt it takes on in a buyout. From a debt provider's perspective, also the volatility of cash flows is important. Low volatility in cash flows provides confidence for lenders and therefore provides more capacity for gearing. In this study cash flow generation is measured with EBITDA (earnings before interest, taxes, and depreciation & amortisation) margin and volatility as standard deviation of EBITDA margin. EBITDA, gross cash flow, represent a proxy for cash earnings before capital expenditures and debt service. Lehn & Poulsen (1989), Singh (1990) and Desbrières & Schatt (2002) have documented the significance of cash flow generation with LBO targets and Opler & Titman (1991) have tested the volatility of cash flows as explanatory variable. In addition, Bae & Jo (2002) show that firms with greater volatility of cash flow and greater future growth potential are more likely to adopt a divisional LBO than a whole company LBO as their restructuring choice.

Although operating efficiency is reflected in the ability to generate cash flow (EBITDA), significant depreciation and amortisation of assets can in the short-term improve cash flows significantly. As the maturity of companies affect both growth prospects and cash flows, maturity is tested with proxy of depreciation and amortisation in proportion of capital spending on assets. For mature businesses with low capex requirements this relation should be close to one.

Two efficiency variables are tested in order analyse the operating efficiency level. Asset turnover reflects the ability to generate revenue on assets and takes into consideration the relative size of balance sheet. This is important in LBOs as funds can be borrowed against assets on balance sheet. Similarly, high operating profit (EBIT, earnings before interest and taxes) on assets shows ability to generate profit on given level of assets. Singh (1990) has shown that relative operating profit on assets has explanatory power in determining buyout probability, and Smith (1990), Kaplan (1989), Opler & Titman (1991) as well as Desbrières & Schatt (2002) have documented changes in these variables in the post buyout period. Some studies (e.g. Opler & Titman, 1993) have used R&D investments and other costs as variables testing for LBO likelihood especially in certain industries. In this study costs are not analysed separately, as the chosen efficiency measures will reflect the cost structures of the sample companies.

Liquidity provides ability to explore investment opportunities and other strategic options, like acquisitions. If consolidation opportunities do not exist, or the company does not have the willingness to make expansion decisions, its liquidity (cash position) will improve if it is cash flow positive. This is one of the fundamental characteristics of Jensen's (Jensen, 1986) free cash flow hypothesis. In a number of LBO studies liquidity is measured as cash and equivalents divided by total assets. This measure does not take into consideration the nature of liquidity, as cash may be a result of capital raising, instead of organically generated cash. This problem can be eliminated by using a net debt measure for cash i.e. cash and equivalents minus interest bearing debt. This study uses both the traditional liquidity measure (cash and equivalents divided by total assets) as well as the net debt liquidity measure (net debt divided by total assets). Liquidity is closely related to gearing, as excess cash available on balance sheet may be a result of debt raising, rather than organically developed cash. Gearing can improve the cost of capital and ability to finance growth, and therefore gearing is an important competitive factor in certain industries. Gearing is measured as interest-bearing debt divided by shareholders equity. Opler & Titman (1991) have documented evidence on the higher relative liquidity of LBO targets and Singh (1990) has tested the explanatory power of gearing when LBO probability is determined.

In theory, size does not have direct linkage to LBO probability but since midmarket buyouts are more common than large buyouts, smaller companies may have higher likelihood for LBO. In addition, size can have explanatory power when LBOs are compared to strategic mergers and acquisitions. Therefore, size variable is included in this methodology. All of the variable definitions

and predicted signs for each variable are presented in table 1. Correlation between the variables is reported in appendix 1 separately for each of the tested samples. The statistical descriptive statistics of each sub sample are presented in table 2.

TABLE 1. Variable definitions and predicted signs. The table presents the definitions for each of the tested variables as well as the predicted signs for each variable.

Variable	Variable Code	Variable Definition	Predicted sign by Hypothesis		
			Free Cash Flow	Insider Information	Under-performance
Growth (1)	LTM_GR	LTM ⁽¹⁾ revenue growth prior to announcement	-	-	-
Growth (2)	L2Y_GR	CAGR ⁽²⁾ of last 2 years revenue growth prior to announcement	-	-	-
Cash flow generation	EBITDAM	LTM ⁽¹⁾ EBITDA margin	+	-	-
Operating efficiency	EBIT_TA	LTM ⁽¹⁾ EBIT divided by total assets	+	-	-
Cash flow volatility	CF_VOL	Standard deviation of last 3 years EBITDA margin	-	+	+
Maturity	MAT	Average of past 2 years depreciation & amortisation as a proportion of capex	+	-	-
Asset Turnover	ASTURN	LTM ⁽¹⁾ Sales divided by total assets at announcement	+	-	-
Liquidity (1)	LIQ1	Net debt divided by total assets	-	-	- (+)
Liquidity (2)	LIQ2	Cash & marketable securities divided by total assets	+	+	+
Gearing	GEAR	Total debt divided by shareholders equity	-	-	-
Size	SIZE	Natural logarithm of LTM ⁽¹⁾ revenue	(3)	(3)	(3)

⁽¹⁾ Latest twelve months

⁽²⁾ Cumulative annual growth rate

⁽³⁾ No direct link to theory

TABLE 2. Descriptive statistics of the sample. Table below presents descriptive statistics for 71 European LBOs, 71 peer groups and 685 strategic European acquisitions. The variables are latest twelve months (LTM) revenue growth (LTM_GR), cumulative annual growth rate of last 2 years revenue growth (L2Y_GR), LTM EBITDA margin (EBITDAM), LTM EBIT divided by total assets (EBIT_TA), standard deviation of last 3 years EBITDA margin (CF_VOL), average of past 2 years depreciation & amortisation as a proportion of capex (MAT), LTM sales divided by total assets at announcement (ASTURN), net debt divided by total assets (LIQ1), cash & marketable securities divided by total assets (LIQ2), total debt divided by shareholders equity (GEAR) and natural logarithm of LTM revenue (SIZE).

Panel A: LBOs (N=71)					
Variable	Mean	Median	Standard Deviation	Minimum	Maximum
LTM_GR	0.094	0.063	0.206	-0.236	0.529
L2Y_GR	0.089	0.071	0.201	-0.279	0.529
EBITDAM	0.144	0.120	0.092	0.051	0.417
EBIT_TA	0.098	0.102	0.052	0.007	0.200
CF_VOL	0.026	0.017	0.029	0.001	0.100
MAT	0.796	0.655	0.574	0.024	2.207
ASTURN	1.275	1.280	0.572	0.281	2.326
LIQ1	0.168	0.162	0.149	-0.117	0.399
LIQ2	0.068	0.034	0.070	0.004	0.237
GEAR	0.645	0.560	0.428	0.035	1.465
SIZE	5.405	5.030	1.068	3.826	7.417

Panel B: Peer Groups (N=71)					
Variable	Mean	Median	Standard Deviation	Minimum	Maximum
LTM_GR	0.139	0.105	0.124	-0.032	0.463
L2Y_GR	0.139	0.112	0.124	-0.012	0.452
EBITDAM	0.177	0.140	0.085	0.083	0.383
EBIT_TA	0.088	0.081	0.035	0.040	0.189
CF_VOL	0.020	0.017	0.009	0.008	0.039
MAT	1.114	0.931	0.901	0.319	4.192
ASTURN	0.978	1.065	0.347	0.382	1.498
LIQ1	0.172	0.184	0.105	-0.022	0.337
LIQ2	0.090	0.087	0.044	0.027	0.185
GEAR	0.907	0.834	0.543	0.231	2.339
SIZE	5.575	5.293	0.943	4.490	7.317

Panel C: Strategic Acquisitions (N=685)					
Variable	Mean	Median	Standard Deviation	Minimum	Maximum
LTM_GR	0.072	0.044	0.176	-0.264	0.496
L2Y_GR	0.073	0.059	0.138	-0.148	0.423
EBITDAM	0.168	0.121	0.150	0.043	0.635
EBIT_TA	0.078	0.077	0.043	0.009	0.168
CF_VOL	0.016	0.010	0.024	0.001	0.098
MAT	1.489	0.677	0.474	0.061	1.970
ASTURN	1.047	1.011	0.574	0.103	2.185
LIQ1	0.152	0.159	0.176	-0.208	0.473
LIQ2	0.094	0.063	0.089	0.003	0.335
GEAR	0.818	0.600	0.626	0.040	2.258
SIZE	6.545	6.505	1.670	3.736	9.578

4. EMPIRICAL RESULTS

Table 3 lists the mean and median values for the LBOs and peer groups as well as the differences in these. T-tests and Wilcoxon tests show different significance levels for variables, because means tend to have higher absolute differences. The test on medians is more conservative and provides more solid evidence for rejecting the null hypothesis that there are no differences in the operating characteristics of LBO targets and peer groups prior to the LBO announcements.

There are significant differences in the means and medians in prior two years growth, EBITDA margin, asset turnover, liquidity and gearing. The maturity and cash flow volatility are statistically significant only in paired t-test, whereas the median difference on latest twelve months growth is significant on 10% level.

TABLE 3. Comparison of summary data for LBOs and peer groups. The table presents mean and median statistics for 71 European LBOs and 71 peer groups. Panel A shows the mean values for the sub samples as well as the t-statistics for differences in means. Panel B shows the median values for the sub samples as well as the Wilcoxon z-statistics for differences in medians. The variables are latest twelve months (LTM) revenue growth (LTM_GR), cumulative annual growth rate of last 2 years revenue growth (L2Y_GR), LTM EBITDA margin (EBITDAM), LTM EBIT divided by total assets (EBIT_TA), standard deviation of last 3 years EBITDA margin (CF_VOL), average of past 2 years depreciation & amortisation as a proportion of capex (MAT), LTM sales divided by total assets at announcement (ASTURN), net debt divided by total assets (LIQ1), cash & marketable securities divided by total assets (LIQ2), total debt divided by shareholders equity (GEAR) and natural logarithm of LTM revenue (SIZE).

Panel A: Mean values of variables for LBO targets and peer groups and corresponding t-statistics for differences in means

Variable	LBO Firms	Peer Group	Mean Difference	t-Statistic for difference in means
LTM_GR	0.094	0.139	-0.045	-1.63
L2Y_GR	0.089	0.139	-0.050	-1.77*
EBITDAM	0.144	0.177	-0.032	-3.23***
EBIT_TA	0.098	0.088	0.010	1.25
CF_VOL	0.026	0.020	0.007	1.82*
MAT	0.796	1.114	-0.318	-2.37**
ASTURN	1.275	0.978	0.297	4.52***
LIQ1	0.168	0.172	-0.003	-0.16
LIQ2	0.068	0.090	-0.023	-2.23**
GEAR	0.645	0.907	-0.262	-3.48***
SIZE	5.405	5.575	-0.170	-1.91*

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

Panel B: Median values of variables for LBO targets and peer groups and corresponding z-statistics for Wilcoxon signed rank sum test

Variable	LBO Firms	Peer Group	Median Difference	z-Statistic for difference in medians
LTM_GR	0.063	0.105	-0.042	-1.95*
L2Y_GR	0.071	0.112	-0.041	-1.91*
EBITDAM	0.120	0.140	-0.020	-3.48***
EBIT_TA	0.102	0.081	0.021	1.39
CF_VOL	0.017	0.017	0.000	0.44
MAT	0.655	0.931	-0.276	-1.61
ASTURN	1.280	1.065	0.215	3.55***
LIQ1	0.162	0.184	-0.022	-0.36
LIQ2	0.034	0.087	-0.053	-2.24**
GEAR	0.560	0.834	-0.274	-2.46**
SIZE	5.030	5.293	-0.263	-1.42

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

These results support both the free cash flow and the underperformance hypothesis. Free cash flow hypothesis is supported by the evidence that LBO companies have lower growth rates in both growth measures, and their efficiency in terms of EBIT and asset turnover levels is higher than those of the peer groups. However, lower EBITDA margin of the LBOs does not support the free cash flow hypothesis. In addition, higher capital spending (lower maturity) of LBOs is not reflected in the growth of these companies. One explanation to this can be that investments have been made in projects that have not generated growth, which would support the underperformance hypothesis. Liquidity and gearing measures show that the net debt levels (liquidity 1) of both groups are not different, although peer companies have more cash reserves (liquidity 2). This may be a result of debt raising that would explain the higher gearing. This finding does not either support the free cash flow hypothesis as it states that LBO companies typically have high unused cash reserves.

The underperformance hypothesis is supported with the low EBITDA margins. LBO targets have significantly higher efficiency in terms of EBIT and asset turnover levels, and yet they have very low cash flow generation and growth. In the light of these findings the LBO targets provide significant potential in terms of optimising their cash flow generation and growth.

4.1. Logit regression analysis

Panel A in table 4 presents the results of logistic regression models. Each sub sample is tested with four regression models. For each model the dependent variable is zero for peer groups and one

for LBO firms. The differences in the four models are selected growth and liquidity variables as well as the size variable. Each model includes one growth and one liquidity variable at a time, and the models are tested with and without the size variable. The reasoning behind this type of research design is the ability test for two growth periods and two ways of measuring liquidity. Both the short-term (12 months) and medium term (24 months) growth can be tested separately. In addition, for liquidity this allows for the analysis of the net debt and not only for liquid assets. SIZE is a test variable that is added to two of the models in order to control for size effects. The overall explanatory power of each model is reported by χ^2 and R^2 .⁸

The logit analysis shows that for LBOs and peer groups the likelihood for LBO is dependent on medium term growth. L2Y_GR is significant at 5% level in the two cases it is present. Although the sign of the short-term growth (LTM_GR) is negative as expected, the coefficient is not statistically significant. The analysis also reveals a direct relationship between LBO likelihood and cash flow volatility (CF_VOL). Opposite to prediction based on free cash flow hypothesis, the sign of the cash flow volatility is positive in all four equations. This is inline with the expected sign based on the underperformance hypothesis. Asset turnover (ASTURN) supports free cash flow theory with a positive sign and is statistically significant at 5% level in all four cases. Maturity (MAT) is significant at 10% level in one of the four equations and has a negative sign supporting the underperformance hypothesis.

For LBOs and peer groups the other tested variables EBITDAM, EBIT_TA, LIQ1, LIQ2, GEAR and SIZE are not statistically significant. These are key variables for testing free cash flow hypothesis and therefore these results do not support this hypothesis. Firstly, the insignificance of EBITDAM (and its negative sign in one of the four models) indicates that cash generation is not a relevant factor for LBO likelihood. In fact, the mean and median liquidity of LBOs in the sample are lower than those of the peer groups suggesting that higher liquidity companies have been less likely LBO candidates. Accordingly, this lower liquidity proposes that the LBO companies have been less likely to suffer from agency costs of excess cash reserves than their peers.

As discussed with sample selection, the alternative for a non-LBO company is to remain public (or private for that matter), or to be acquired or merged. With the aim of taking these three options into consideration, a pooled sample is tested. On top of the 71 LBOs and 71 peer groups tested in the previous regressions, the pooled sample includes 685 strategic mergers and acquisitions from the same industry sub sectors as the LBOs. All of these transactions are announced within the same time period of 7 years as the LBOs. The probability of going private through a

⁸ Technically, R^2 cannot be computed the same way in logistic regression as it is in OLS regression. The statistical in this research are performed with Stata which defines the pseudo- R^2 , in logistic regressions as $(1 - L_1)/L_0$, where L_0 represents the log likelihood for the constant-only model and L_1 is the log likelihood for the full model with constant and predictors. Source: www.stata.com.

leveraged buyout is tested by giving the dependent dummy variable value one for LBOs and value zero for both peer groups as well as for strategic mergers and acquisitions.

The logistic regression results for the pooled sample are also reported in Table 4. In line with the first regressions (LBOs and peer groups) there is a direct relationship between LBO likelihood and cash flow volatility (CF_VOL), and the sign of the coefficient is positive. This is inline with the underperformance hypothesis. The results for the operating variables differ between the two samples. Asset turnover has again positive sign in this case but is significant in only one of the four equations. The other efficiency measure EBIT_TA is statistically significant in all four models with the expected positive sign. The positive signs of the operating efficiency measures are supportive for the free cash flow hypothesis. The size variable is significant in the two cases it is present, which indicates mainly added variance of this variable given the deal size scale of the strategic transactions. SIZE is not significant in the first sample, due to the matched sizes of the LBOs and peer groups.

In addition to the sample consisting of LBOs and peer groups, also the pooled sample demonstrate opposite results to those expected on the basis of the free cash flow theory. The most considerable of these is the negative sign of the EBITDAM that is statistically significant in two of the four models. Another notable result is that both liquidity measures are significant with opposite than expected signs, indicating lower liquidity increasing probability for LBO.

Opposite to the first sample neither of the growth variables are significant, and contradictory to the expected the short term growth (LTM_GR) coefficient has a positive sign. Maturity does not either show significance in the pooled sample, and its sign is in this case as well negative supporting the underperformance hypothesis. The sign of gearing (GEAR) changed from positive to negative, but in both samples its coefficients are not statistically significant.

In order to compare just the strategic mergers and acquisitions with LBOs, the same regression models are tested with a sample excluding the peer groups. Hence, it includes LBOs and strategic mergers and acquisitions. This sample reflects the different characteristics of companies either undergoing an LBO or taking the strategic M&A route. Equally this sample should reflect more the differentiating characteristics of LBO targets from strategic targets.

The results of this third sub sample show 1% significance in three models and 5% significance in one for EBITDAM. This significance, and the consistent negative sign of the coefficient emphasizes the results of the whole pooled sample. High EBITDA margins are not driving companies to undergo LBOs in Europe. LBO companies in the sample do have higher operating efficiency, as EBIT_TA is significant at 1% level in three equations and at 5% level in one. This result is inline with the pooled sample as well as the significance and sign of cash flow volatility. CF_VOL is significant at 1%–5% level in all four models. Equally, liquidity measures (LIQ1 and LIQ2) are significant in all four models in this sub sample like in the pooled sample. Both growth vari-

ables (LTM_GR and L2Y_GR) and size variable have similar signs and insignificance levels with the pooled sample. The differences between the results from the pooled sample are that asset turnover (ASTURN) is not showing any significance in this sub sample. The signs of GEAR variable are negative in this sub sample, which is inline with the theory and predicted sign. In one of the models the coefficient of gearing is significant at 1% level.

4.2. Regressions for controlling robustness

Given the relatively high correlation between EBITDAM and EBIT_TA as well as liquidity measure and gearing as reported in appendix 1, the samples are tested with adjusted models where these variables are not present at the same time. The models are presented in panels B and C of table 4. In addition, the presence of ASTURN variable is reduced in order to isolate the significance of EBITDAM and EBIT_TA. The results highlight the findings presented in panel A. Especially for LBOs and peer groups the results in panels B and C are similar to those of LBOs and strategic acquisitions and the pooled sample. Both growth variables are significant at ten percent level.

For LBOs and strategic acquisitions the effects of reduced number of variables are not as strong. The main changes are the lower level of significance of CF_VOL (ten percent level in two out of three models in panel B and ten to five percent level in panel C) and the five percent significance level of AS_TURN in the one case it is present in panel B and one percent level in panel C. The signs are all unchanged except that all GEAR signs are now negative, opposed to one positive in panel A. CF_VOL variable has lower significance than in panel for the pooled sample. The main chance for this sample is the negative sign of GEAR and its significance at one percent level in two out of four models. In general, the models presented in panels B and C emphasise the results of panel A and show more consistent results of the significances and signs of the tested variables.

The LBO sample is dominated by LBOs in United Kingdom (UK). As the most developed European buyout market UK has the longest history of buyout transactions in Europe. This is notably especially in the amount of public to private LBO transactions UK compared to any other European country. For the purpose of testing the robustness of the European sample the statistical analysis is done separately for samples consisting of only UK LBOs and only non-UK LBOs. Panel A of table 5 presents the mean values for UK LBOs and peer groups as well as the t-statistic for the difference in means. These are in line with the European sample. However, for UK LBOs the cash flow volatility is insignificant, although this was significant in the corresponding test for the European sample.

The logistic regression analysis with the UK sample provides evidence of differences to the pooled sample and non-UK sample. Panels B and C of table 5 show that by and large, in all cases when strategic acquisitions are present (models 5–12) the UK sample has similar signs and

TABLE 4. Logistic regression analysis for the likelihood of LBO. Panels A, B and C present the regression analysis for the likelihood of going private for the three sub samples. The dependent variable is LBO dummy that equals 1 if the company is an LBO target and zero otherwise. The variables are latest twelve months (LTM) revenue growth (LTM_GR), cumulative annual growth rate of last 2 years revenue growth (L2Y_GR), LTM EBITDA margin (EBITDAM), LTM EBIT divided by total assets (EBIT_TA), standard deviation of last 3 years EBITDA margin (CF_VOL), average of past 2 years depreciation & amortisation as a proportion of capex (MAT), LTM sales divided by total assets at announcement (ASTURN), net debt divided by total assets (LIQ1), cash & marketable securities divided by total assets (LIQ2), total debt divided by shareholders equity (GEAR) and natural logarithm of LTM revenue (SIZE).

Variable	LBOs and Peer Groups				LBOs and Strategic Acquisitions				LBOs, Peer Groups and Strategic Acquisitions			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LTM_GR	-0.745 (-1.23)		-0.726 (-1.21)		0.295 (0.40)	-0.754 (-0.71)	0.788 (1.06)		0.063 (0.18)	-0.979 (-0.89)	0.159 (0.47)	
L2Y_GR		-2.451 (-2.19)**		-2.333 (-2.18)**				-0.128 (-0.11)				-0.402 (-0.41)
EBITDAM	0.420 (0.11)	-0.194 (-0.05)	0.615 (0.17)	0.031 (0.01)	-5.057 (-3.31)**	-5.402 (-3.56)**	-4.106 (-2.56)**	-4.147 (-2.67)**	-4.113 (-2.00)**	-5.427 (-3.35)**	-2.920 (-1.38)	-3.173 (-1.54)
EBIT_TA	6.400 (1.06)	7.233 (1.12)	6.824 (1.16)	8.017 (1.30)	9.062 (2.39)**	10.972 (2.63)**	10.375 (2.76)**	12.183 (3.07)**	8.749 (2.72)**	11.046 (2.60)**	9.844 (3.02)**	11.430 (3.18)**
CF_VOL	17.931 (1.89)*	19.002 (2.06)**	18.565 (1.96)*	19.925 (2.20)**	11.763 (2.09)**	12.909 (2.26)**	18.093 (3.35)**	19.789 (3.68)**	20.445 (3.07)**	15.369 (2.66)**	26.487 (4.20)**	29.254 (4.73)**
MAT	-0.564 (-1.51)	-0.665 (-1.61)	-0.568 (-1.58)	-0.660 (-1.71)*	0.060 (0.20)	-0.035 (-0.12)	0.223 (0.72)	0.123 (0.40)	-0.165 (-1.14)	-0.155 (-0.56)	-0.127 (-0.34)	-0.144 (-1.23)
ASTURN	1.424 (2.38)**	1.326 (2.13)**	1.422 (2.36)**	1.317 (2.12)**	0.250 (0.70)	0.036 (0.10)	0.275 (0.78)	0.115 (0.33)	0.574 (1.51)	0.115 (0.32)	0.643 (1.65)*	0.538 (1.46)
LIQ1	0.700 (0.34)		0.580 (0.28)		3.646 (3.57)**		4.118 (4.03)**		1.594 (1.76)*		1.680 (1.82)*	
LIQ2		-6.063 (-1.33)		-5.892 (-1.29)		-5.549 (-3.24)**		-6.065 (-3.19)**		-6.007 (-3.23)**		-5.759 (-2.39)**
GEAR	-0.028 (-0.07)	-0.005 (-0.02)	-0.025 (-0.07)	-0.013 (-0.04)	-0.452 (-1.58)	0.250 (1.12)	-0.784 (-2.81)**	-0.030 (-0.14)	0.132 (0.49)	0.161 (0.71)	0.035 (0.12)	0.216 (1.03)
SIZE	-0.089 (-0.44)	-0.133 (-0.60)			-0.516 (-6.26)**	-0.550 (-6.62)**			-0.448 (-5.21)**	-0.520 (-6.14)**		
Constant	-1.652 (-0.86)	-0.467 (-0.23)	-2.204 (-1.58)	-1.343 (-0.95)	-0.086 (-0.10)	0.922 (1.07)	-3.590 (-5.44)**	-2.843 (-4.53)**	-1.177 (-1.26)	0.691 (0.78)	-4.291 (-5.78)**	-3.681 (-5.31)**
N	142	142	142	142	756	756	756	756	827	827	827	827
Model Chi-Square	17.38**	17.33**	16.67**	17.61**	76.29***	77.1***	41.67***	32.56***	66.55***	62.91***	39.28***	36.82***
R ²	0.146	0.1753	0.1446	0.173	0.151	0.153	0.095	0.090	0.155	0.169	0.112	0.126

*** Statistically significant at 1% confidence level.
 ** Statistically significant at 5% confidence level.
 * Statistically significant at 10% confidence level.

Panel B: Robustness check for logistic regressions with adjusted models

Variable	LBOs and Peer Groups			LBOs and Strategic Acquisitions				LBOs, Peer Groups and Strategic Acquisitions				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LTM_GR	-0.958 (-1.92)*	-0.644 (-1.34)			0.450 (0.65)	0.611 (0.89)			-0.045 (-0.14)	0.146 (0.45)		
L2Y_GR			-1.998 (-1.75)*	-1.328 (-1.19)			-0.610 (-0.53)	-0.330 (-0.33)			-0.598 (-0.45)	0.042 (0.03)
EBITDAM	2.140 (0.64)	-4.651 (-1.79)*		-1.409 (-0.60)	-3.158 (-2.66)***	-5.039 (-4.24)***		-4.066 (-3.96)***	-1.920 (-1.24)	-5.149 (-3.75)**		-3.195 (-2.15)**
EBIT_TA			7.666 (1.51)				9.214 (2.68)***				9.256 (2.69)***	
CF_VOL	16.479 (1.91)*	16.936 (2.17)**	18.066 (1.91)*		9.961 (1.84)*	8.914 (1.66)*	3.848 (0.81)		18.352 (2.70)***	17.361 (2.62)***	13.334 (1.76)*	
MAT	-0.503 (-1.22)	-0.496 (-1.27)	-0.530 (-2.14)**	-0.318 (-1.28)	0.009 (0.03)	0.029 (0.10)	0.318 (1.22)	-0.026 (-0.09)	-0.175 (-0.91)	-0.166 (-1.05)	-0.126 (-1.87)*	-0.091 (-0.81)
ASTURN	1.688 (2.91)***				0.653 (2.36)***				0.964 (3.05)***			
LIQ1	0.490 (0.26)	0.288 (0.17)			3.472 (3.45)***	3.074 (3.38)***			1.400 (1.47)	1.109 (1.21)		
LIQ2			-6.362 (-1.63)	-5.045 (-1.55)			-4.882 (-2.92)***	-4.378 (-2.83)***			-4.411 (-2.13)**	-3.551 (-2.04)**
GEAR	-0.102 (-0.25)	-0.194 (-0.44)	-0.144 (-0.34)	-0.263 (-0.70)	-0.603 (-2.19)**	-0.634 (-2.36)**	-0.073 (-0.34)	-0.077 (-0.38)	0.036 (0.12)	-0.025 (-0.08)	0.108 (0.45)	0.048 (0.23)
SIZE	-0.125 (-0.64)	-0.146 (-0.81)	-0.040 (-0.21)	-0.215 (-1.18)	-0.535 (-6.39)***	-0.533 (-6.52)***	-0.442 (-5.75)***	-0.610 (-7.50)	-0.471 (-3.27)***	-0.475 (-5.47)***	-0.343 (-4.26)***	-0.531 (-6.20)***
Constant	-1.337 (-0.76)	1.817 (1.48)	0.459 (0.34)	2.207 (2.05)**	0.256 (0.31)	1.385 (2.06)**	-0.305 (-0.42)	2.451 (3.69)***	-0.901 (-0.99)	0.841 (1.26)	-1.027 (-1.54)	1.616 (2.35)**
N	142	142	142	142	756	756	756	756	827	827	827	827
Model Chi-Square	17.25**	8.61	12.8*	6.52	70.28***	73.18***	50.13***	66.34***	60.55***	55.68***	46.12***	41.44***
R ²	0.139	0.092	0.116	0.066	0.136	0.124	0.108	0.117	0.140	0.119	0.113	0.085

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

Panel C: Robustness check for logistic regressions with adjusted models

Variable	LBOs and Peer Groups			LBOs and Strategic Acquisitions				LBOs, Peer Groups and Strategic Acquisitions				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LTM_GR	-0.935 (-0.50)*	-0.937 (-0.49)*			0.037 (-0.32)	0.022 (-0.33)			-0.054 (-0.33)	-0.068 (-0.34)		
L2Y_GR			-1.885 (-1.20)	-1.495 (-1.14)			-0.236 (-1.25)	0.076 (-1.16)			-0.617 (-1.32)	-0.280 (-1.23)
EBITDAM	2.399 (-3.36)	2.418 (-3.34)			-2.255 (-1.47)	-2.008 (-1.45)			-1.907 (-1.55)	-1.695 (-1.54)		
EBIT_TA			8.572 (4.91)*	8.479 (4.336)*			9.315 (3.293)***	7.823 (2.846)***			8.755 (3.245)***	7.318 (2.797)***
CF_VOL	14.063 (8.249)*	14.081 (8.202)*	15.644 (9.64)	12.450 (7.61)	17.334 (6.492)***	16.851 (6.669)**	12.965 (7.013)*	12.073 (6.501)*	17.900 (6.737)***	17.442 (6.912)**	13.159 (7.366)*	12.289 (6.718)*
MAT	-0.532 (-0.43)	-0.534 (-0.42)	-0.551 (0.259)**	-0.547 (-0.24)**	-0.132 (-0.17)	-0.179 (-0.17)	-0.017 (-0.03)	-0.030 (-0.05)	-0.173 (-0.20)	-0.217 (-0.20)	-0.129 (-0.07)*	-0.147 (-0.07)**
ASTURN	1.728 (0.581)***	1.722 (0.572)***			0.870 (0.298)***	0.744 (0.284)***			0.962 (0.314)***	0.841 (0.299)***		
LIQ1	0.127 (-1.52)				1.530 (0.658)**				1.488 (0.688)**			
LIQ2			-6.149 (-4.05)				-4.194 (-1.85)**				-4.522 (-2.06)**	
GEAR												
SIZE	-0.127 (-0.20)	-0.124 (-0.19)	-0.043 (-0.19)	-0.028 (-0.18)	-0.493 (-0.09)***	-0.479 (-0.09)***	-0.351 (-0.08)***	-0.359 (-0.08)***	-0.470 (-0.09)***	-0.458 (-0.09)***	-0.340 (-0.08)***	-0.349 (-0.08)***
Constant	-1.369 (-1.78)	-1.362 (-1.77)	0.305 (-1.30)	-0.228 (-1.20)	-0.507 (-0.86)	-0.185 (-0.82)	-0.905 (-0.62)	-1.062 (-0.61)*	-0.889 (-0.90)	-0.562 (-0.86)	-0.896 (-0.60)	-1.074 (-0.58)**
N	142	142	142	142	756	756	756	756	827	827	827	827
Model Chi-Square	16.3**	7.03	12.23*	11.34**	64.49***	58.82***	48.9***	44.32***	60.5***	54.97***	43.89***	39.92***
R ²	0.135	0.073	0.110	0.089	0.147	0.137	0.120	0.105	0.140	0.131	0.112	0.097

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

significance levels with the pooled sample. However, EBIT_TA is not significant for non-UK LBOs when LBOs are compared only to strategic acquisitions. There are differences when only for LBOs and peer groups are present (models 1–4). Firstly, in panel B both growth variables are significant for UK LBOs. The medium-term growth shows significance even when strategic acquisitions are included which is not the case with the European sample. In addition, assets turnover is significant only once, compared to high significance in all four cases in the European sample. Simultaneously, both liquidity variables and gearing are all highly significant in all four models and none of these is significant in the European sample with LBOs and peer groups. For the non-UK sample in panel C neither of the growth variables is significant.

TABLE 5. Comparison of summary data and logistic regression analysis for UK LBOs. Table 5 presents statistics for 48 UK LBOs, their respective 46 peer groups and 228 UK strategic mergers and acquisitions. Panel A shows the mean values for the LBOs and peer groups as well as the t-statistics for differences in means. Panel B shows the regression analysis for the likelihood of going private for the three sub samples. The dependent variable is LBO dummy that equals 1 if the company is an LBO target and zero otherwise. The variables are latest twelve months (LTM) revenue growth (LTM_GR), cumulative annual growth rate of last 2 years revenue growth (L2Y_GR), LTM EBITDA margin (EBITDAM), LTM EBIT divided by total assets (EBIT_TA), standard deviation of last 3 years EBITDA margin (CF_VOL), average of past 2 years depreciation & amortisation as a proportion of capex (MAT), LTM sales divided by total assets at announcement (ASTURN), net debt divided by total assets (LIQ1), cash & marketable securities divided by total assets (LIQ2), total debt divided by shareholders equity (GEAR) and natural logarithm of LTM revenue (SIZE).

Panel A: Mean values of variables for UK LBO targets and peer groups and corresponding t-statistics for differences in means

Variable	LBO Firms	Peer Group	Mean Difference	t-Statistic for difference in means
LTM_GR	0.097	0.143	-0.046	-1.33
L2Y_GR	0.068	0.160	-0.092	-2.56**
EBITDAM	0.154	0.196	-0.042	-3.54***
EBIT_TA	0.111	0.104	0.007	0.48
CF_VOL	0.029	0.022	0.007	1.43
MAT	0.709	1.537	-0.827	-2.21**
ASTURN	1.290	0.915	0.374	4.39***
LIQ1	0.156	0.171	-0.015	-0.55
LIQ2	0.062	0.094	-0.032	-2.35**
GEAR	0.558	0.977	-0.419	-4.58***
SIZE	5.086	5.328	-0.242	-2.16**

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

Panel B: Logistic regression analysis, UK only

Variable	LBOs and Peer Groups (UK only)			LBOs and Strategic Acquisitions (UK only)			LBOs, Peer Groups and Strategic Acquisitions (UK only)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LTM_GR	-3.576 (-1.90)*		-3.468 (-2.08)**		-0.322 (-0.33)		0.564 (0.60)		-0.593 (-0.59)		0.271 (0.28)	
L2Y_GR		-6.866 (-2.92)**		-6.281 (-2.76)**		-2.133 (-1.74)*		-1.308 (-1.08)		-2.548 (-1.99)**		-1.751 (-1.39)
EBITDAM	-3.720 (-0.78)	-1.935 (-0.40)	-3.586 (-0.75)	-0.953 (-0.20)	-4.356 (-2.47)**	-4.379 (-2.55)**	-4.277 (-2.34)**	-4.422 (-2.47)**	-4.485 (-2.27)**	-4.456 (-2.31)**	-4.412 (-2.21)**	-4.508 (-2.30)**
EBIT_TA	9.739 (1.13)	13.305 (1.47)	9.496 (1.09)	12.046 (1.35)	11.471 (2.42)**	14.076 (2.65)**	10.673 (2.32)**	12.751 (2.53)**	12.513 (2.70)**	15.269 (2.89)**	11.225 (2.50)**	13.820 (2.76)**
CF_VOL	29.237 (2.07)**	27.737 (1.88)*	29.156 (2.09)**	26.372 (1.95)*	7.097 (1.11)	7.613 (1.19)	12.336 (2.06)**	14.145 (2.40)**	8.742 (1.30)	9.238 (1.38)	13.891 (2.25)**	15.412 (2.50)**
MAT	-1.126 (-1.56)	-1.756 (-2.08)**	-1.112 (-1.63)	-1.666 (-2.25)**	-0.101 (-0.25)	-0.183 (-0.47)	0.016 (0.04)	-0.105 (-0.27)	-0.363 (-1.41)	-0.445 (-1.44)	-0.300 (-1.39)	-0.368 (-1.36)
ASTURN	1.370 (1.69)*	1.054 (1.38)	1.385 (1.64)	1.156 (1.36)	0.085 (0.21)	-0.063 (-0.15)	-0.083 (-0.21)	-0.226 (-0.57)	0.239 (0.58)	0.011 (0.03)	0.071 (0.18)	-0.138 (-0.35)
LIQ1	12.550 (3.52)**		12.578 (3.51)**		1.703 (1.00)**		1.904 (1.19)**		2.977 (1.91)*		2.747 (1.76)*	
LIQ2		-18.074 (-3.73)**		-17.774 (-3.72)**		-4.186 (-1.64)		-4.946 (-1.87)*		-5.354 (-2.00)**		-5.955 (-2.07)**
GEAR	-4.848 (-4.03)**	-2.192 (-3.27)**	-4.920 (-3.79)**	-2.499 (-3.48)**	0.378 (0.66)	0.782 (1.88)*	-0.071 (-0.13)	0.360 (0.93)	-0.273 (-0.64)	0.322 (0.93)	-0.520 (-1.15)	0.059 (0.16)
SIZE	-0.060 (-0.15)	-0.299 (-0.73)			-0.522 (-4.43)**	-0.557 (-4.60)**			-0.507 (-4.09)**	-0.529 (-4.24)**		
Constant	0.474 (0.17)	3.957 (1.30)	0.171 (0.09)	2.332 (1.33)	0.211 (0.21)	0.828 (0.89)	-2.449 (-3.12)**	-1.887 (-2.69)**	0.001 (0.00)	0.803 (0.84)	-2.505 (-3.14)**	-1.824 (-2.48)**
N	96	96	96	96	276	276	276	276	324	324	324	324
Model Chi-Square	24.37***	30.77***	21.86***	29.49***	33.47***	38.26***	12.46***	15.07***	32.98***	39.42***	17.34***	22.12***
R ²	0.386	0.4363	0.3853	0.432	0.118	0.138	0.060	0.073	0.121	0.141	0.071	0.088

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

Panel C: Logistic regression analysis, Non-UK LBOs

Variable	LBOs and Peer Groups (Non-UK)			LBOs and Strategic Acquisitions (non-UK)			LBOs, Peer Groups and Strategic Acquisitions (Non-UK)					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LTM_GR	-2.700 (-2.563)	-1.182 (-2.228)	-2.692 (-2.546)	-1.191 (-2.152)*	1.155 (1.130)	1.066 (1.654)	1.223 (1.184)	1.661 (1.700)	1.051 (1.168)	1.073 (1.723)	1.081 (1.214)	1.651 (1.759)
L2Y_GR	-0.636 (-8.274)	-4.238 (-7.722)	-0.629 (-8.340)	-4.215 (-7.666)	-4.597 (-2.112)**	-4.520 (-2.03)**	-3.098 (-2.011)	-2.616 (-1.820)	-4.639 (-2.19)**	-4.451 (-2.07)**	-3.295 (-2.109)	-2.713 (-1.874)
EBITDAM	2.835 (12.228)	2.188 (11.717)	2.746 (12.008)	2.155 (11.577)	2.392 (6.706)	3.528 (6.810)	3.761 (6.679)	4.306 (6.859)	2.386 (6.98)*	3.413 (7.091)	3.838 (6.931)**	4.235 (7.11)*
EBIT_TA	23.462 (17.969)	29.242 (17.518)*	22.796 (16.551)	29.081 (16.416)*	15.587 (10.364)	15.515 (10.311)	20.596 (9.533)**	19.998 (9.122)**	16.646 (10.712)	16.377 (10.589)	21.585 (9.834)**	20.811 (9.296)**
MAT	-0.232 (-0.741)	-0.084 (-0.672)	-0.246 (-0.738)	-0.088 (-0.668)	0.557 (0.480)	0.472 (0.481)	0.769 (0.456)*	0.764 (0.439)*	0.510 (0.456)	0.456 (0.475)	0.693 (0.422)	0.721 (0.420)*
ASTURN	1.562 (1.334)	1.080 (1.225)	1.564 (1.344)	1.081 (1.215)	0.535 (0.548)	0.470 (0.519)	0.721 (0.530)	0.716 (0.496)	0.570 (0.565)	0.505 (0.534)	0.745 (0.547)	0.739 (0.511)
LIQ1	1.503 (5.193)		1.518 (5.175)		4.102 (1.478)***		4.233 (1.551)***		4.160 (1.531)***		4.281 (1.593)***	
LIQ2		0.648 (6.79)*		0.623 (6.78)*		-4.768 (-2.987)		-3.977 (-3.033)		-4.779 (-3.136)		-4.046 (-3.170)
GEAR	0.323 (1.671)	0.519 (1.051)	0.338 (1.669)	0.524 (1.031)	-0.542 (-0.365)	0.118 (0.322)	-0.622 (-0.35)*	0.038 (0.301)	-0.557 (-0.375)	0.115 (0.330)	-0.624 (-0.35)*	0.041 (0.309)
SIZE	0.043 (0.386)	0.010 (0.396)			-0.374 (-0.11)**	-0.404 (-0.12)**			-0.361 (-0.12)**	-0.388 (-0.12)**		
Constant	-2.664 (-3.665)	-1.699 (-3.338)	-2.386 (-2.908)	-1.634 (-2.454)	-1.797 (-1.607)	-0.982 (-1.717)	-4.975 (-1.12)**	-4.610 (-1.09)**	-1.951 (-1.619)	-1.199 (-1.750)	-4.991 (-1.12)**	-4.651 (-1.11)**
N	46	46	46	46	480	480	480	480	503	503	503	503
Model Chi-Square	6.34	5.08	6.09	5.04	37.98***	38.38***	27.6***	28.11***	35.33***	36.62***	25.72***	26.7***
R ²	0.091	0.071	0.091	0.071	0.115	0.105	0.088	0.075	0.108	0.099	0.084	0.072

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

4.3. Regression analysis of MBOs

Approximately half (54%) of the LBOs in the sample can be classified as MBOs. As discussed earlier with the insider information hypothesis, the reasons for management led buyouts can be different from those of non-MBOs. Moreover, it is easier for the acting management of the buyout target to evaluate the potential of the investment opportunity. Therefore, the LBO sample is divided into two groups, MBOs and non-MBO LBOs. These results are reported separately in table 6. For MBOs (panel A) the results are inline with the European sample (includes all 71 LBOs) when strategic acquisitions are present (models 5–12). The only significant difference in these models is that cash flow volatility is less significant for MBOs than for the European sample. For MBOs it is significant in only half of the models (compared to all models for European sample) and shows lower statistical significance. For MBOs and peer groups the results differ from the European sample. Short-term growth is significant but medium-term growth is not. Cash flow volatility and maturity are significant in two cases. Liquidity variables and gearing are significant in all models. The most remarkable difference is that asset turnover is not significant.

The non-MBO LBO sample reported in panel B of table 6 shows very different results from those of the other LBO samples. For non-MBO LBOs and peer groups the only significant variable is the cash flow volatility, which is statistically significant in all four cases. When strategic acquisitions are present, cash flow volatility and EBITDA-margin are significant in all 8 cases. However, EBIT_TA is not significant in any of the models, although in all previous cases it has been significant. The only other consistently significant variable is liquidity 1, which is significant in all models with strategic acquisitions. Gearing and liquidity two are not significant in any of the models, despite showing strong significance with all other LBO samples.

4.4. Summary of the results

Overall the results of the regressions provide no evidence of the free cash flow theory being the main explanatory driver of the European LBO activity. The results show that LBO targets have not had significant cash flow generation and significant liquidity when compared to peer groups and targets of strategic acquisitions. These findings are confirmed by all of the presented statistical analysis.

Compared to both peer groups and strategic acquisitions, the European LBOs in the sample did not generate more cash flow. The EBITDA variable shows strong statistical significance in the pooled sample with negative signs and 5–10% significance for all models in the sample for LBOs and strategic transactions. In all tested cases, when strategic transactions are present the EBITDA coefficient is significant, including when MBOs and non-MBO LBOs are separately tested. EBITDA coefficient has the expected positive sign only in the sample that includes peer groups and LBOs. However, this relationship is not significant. These results from regression analysis are dif-

TABLE 6. Logistic regression analysis for the likelihood of MBOs and non-MBO LBOs. Panels A and B of table 6 present the regression analysis for the likelihood of going private for MBOs and non-MBO LBOs respectively. The dependent variable is LBO dummy that equals 1 if the company is an LBO or MBO target and zero otherwise. The variables are latest twelve months (LTM) revenue growth (LTM_GR), cumulative annual growth rate of last 2 years revenue growth (L2Y_GR), LTM EBITDA margin (EBITDAM), LTM EBIT divided by total assets (EBIT_TA), standard deviation of last 3 years EBITDA margin (CF_VOL), average of past 2 years depreciation & amortisation as a proportion of capex (MAT), LTM sales divided by total assets at announcement (ASTURN), net debt divided by total assets (LIQ1), cash & marketable securities divided by total assets (LIQ2), total debt divided by shareholders equity (GEAR) and natural logarithm of LTM revenue (SIZE).

Variable	MBOs and Peer Groups			MBOs and Strategic Acquisitions			MBOs, Peer Groups and Strategic Acquisitions					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LTM_GR	-5.994 (-1.95)*		-4.535 (-1.75)*		-0.712 (-0.79)		0.179 (0.20)		-0.822 (-0.89)		0.052 (0.06)	
L2Y_GR		-3.157 (-1.45)		-2.233 (-1.12)		-2.017 (-1.35)		-1.065 (-0.63)		-2.155 (-1.41)		-1.227 (-0.73)
EBITDAM	-6.922 (-0.86)	1.031 (0.16)	-2.853 (-0.40)	3.773 (0.57)	-6.178 (-2.63)***	-7.024 (-2.91)***	-4.894 (-1.99)**	-5.233 (-2.10)**	-6.221 (-2.51)**	-6.989 (-2.73)***	-4.971 (-1.95)*	-5.260 (-2.04)**
EBIT_TA	16.099 (1.27)	7.204 (0.62)	10.152 (0.89)	3.619 (0.33)	15.372 (2.89)***	19.241 (3.05)***	16.852 (3.24)***	20.151 (3.47)***	15.197 (2.91)***	19.039 (3.01)***	16.380 (3.26)***	19.917 (3.42)***
CF_VOL	8.388 (0.51)	31.774 (1.76)*	17.099 (1.06)	36.079 (2.01)**	6.618 (0.81)	7.997 (0.95)	16.397 (2.12)**	18.179 (2.36)**	7.234 (0.87)	8.463 (0.97)	16.868 (2.14)**	18.445 (2.35)**
MAT	-0.847 (-1.34)	-0.969 (-2.20)**	-0.749 (-1.36)	-0.934 (-2.35)**	-0.058 (-0.13)	-0.133 (-0.30)	0.096 (0.20)	-0.051 (-0.11)	-0.172 (-0.44)	-0.241 (-0.59)	-0.061 (-0.17)	-0.159 (-0.40)
ASTURN	0.931 (0.63)	(1.49)	1.558 (1.09)	1.935 (1.44)	-0.118 (-0.23)	-0.514 (-1.01)	-0.111 (-0.22)	-0.346 (-0.70)	-0.055 (-0.11)	-0.452 (-0.90)	-0.032 (-0.07)	-0.287 (-0.59)
LIQ1	18.023 (3.38)***		16.812 (3.53)***		5.177 (4.26)***		5.332 (4.60)***		5.355 (4.34)***		5.430 (4.58)***	
LIQ2		-17.152 (-2.77)***		-15.692 (-2.75)***		-9.541 (-3.52)***		-10.676 (-3.17)***		-9.876 (-3.45)***		-11.029 (-3.14)***
GEAR	-5.482 (-3.06)***	-1.777 (-2.16)**	-5.826 (-3.27)***	-2.195 (-2.22)**	-1.069 (-2.30)**	0.084 (0.25)	-1.368 (-3.22)***	-0.268 (-0.84)	-1.174 (-2.50)**	-0.019 (-0.06)	-1.415 (-3.27)	-0.299 (-0.92)
SIZE	-0.631 (-1.53)	-0.593 (-1.66)*			-0.822 (-6.08)***	-0.865 (-6.41)***			-0.826 (-5.89)***	-0.862 (-6.11)***		
Constant	3.712 (0.85)	3.588 (1.19)	-0.335 (-0.12)	-0.140 (-0.06)	1.272 (1.19)	2.657 (2.60)***	-3.934 (-4.527)***	-2.867 (-3.97)***	1.284 (1.19)	2.672 (2.56)**	-3.891 (-4.525)***	-2.832 (-3.96)***
N	76	76	76	76	723	723	723	723	761	761	761	761
Model Chi-Square	17.81**	23.95***	24.03***	26.62***	72.24***	72.41***	42.11***	36.14***	69.38***	69.33***	42.4***	37.61***
R ²	0.411	0.372	0.388	0.351	0.228	0.248	0.121	0.135	0.225	0.244	0.122	0.136

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

Panel B: Logistic regression analysis, non-MBO LBOs

Variable	non-MBO LBOs and Peer Groups			non-MBO LBOs and Strategic Acquisitions				non-MBO LBOs, Peer Groups and Strategic Acquisitions				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
LTM_GR	-1.907 (-0.94)		-2.130 (-1.15)		0.954 (0.91)		1.164 (1.08)		0.874 (0.81)		1.091 (0.99)	
L2Y_GR		-2.639 (-1.16)		-2.715 (-1.34)		0.233 (0.14)		0.544 (0.33)		0.118 (0.07)		0.440 (0.26)
EBITDAM	-2.305 (-0.31)	-1.420 (-0.21)	-2.272 (-0.31)	-1.430 (-0.21)	-3.864 (-2.11)**	-3.736 (-2.15)**	-3.259 (-1.81)*	-2.989 (-1.78)*	-3.751 (-2.00)**	-3.640 (-2.05)**	-3.213 (-1.74)*	-2.957 (-1.73)*
EBIT_TA	-0.295 (-0.03)	0.100 (0.01)	-0.445 (-0.04)	0.071 (0.01)	4.008 (0.74)	4.804 (0.85)	4.518 (0.85)	5.319 (0.96)	4.067 (0.74)	4.911 (0.84)	4.547 (0.84)	5.388 (0.95)
CF_VOL	35.154 (1.98)**	30.821 (1.89)**	33.708 (1.95)*	30.481 (1.88)*	16.740 (2.36)**	17.161 (2.44)**	19.723 (2.97)**	20.603 (3.17)**	17.576 (2.45)**	17.945 (2.53)**	20.295 (3.01)**	21.133 (3.22)**
MAT	-0.344 (-0.42)	-0.405 (-0.52)	-0.424 (-0.53)	-0.426 (-0.56)	0.286 (0.70)	0.212 (0.53)	0.412 (1.00)	0.355 (0.88)	0.270 (0.63)	0.193 (0.46)	0.393 (0.92)	0.333 (0.79)
ASTURN	1.371 (1.30)	1.32 (1.17)	1.426 (1.40)	1.334 (1.21)	0.527 (1.18)	0.458 (1.05)	0.577 (1.31)	0.524 (1.25)	0.575 (1.26)	0.498 (1.11)	0.616 (1.37)	0.557 (1.30)
LIQ1	4.923 (1.15)		4.804 (1.13)		2.445 (1.73)*		2.697 (1.95)*		2.511 (1.72)*		2.734 (1.92)*	
LIQ2		-5.543 (-0.83)		-5.576 (-0.85)		-2.023 (-1.03)		-2.072 (-1.01)		-2.130 (-1.04)		-2.159 (-1.01)
GEAR	-1.430 (-1.26)	-0.36 (-0.45)	-1.291 (-1.10)	-0.332 (-0.41)	-0.048 (-0.15)	0.407 (1.33)	-0.213 (-0.67)	0.266 (0.98)	-0.073 (-0.22)	0.394 (1.44)	-0.223 (-0.68)	0.262 (0.94)
SIZE	0.112 (0.33)	0.031 (0.09)			-0.241 (-2.78)**	-0.268 (-3.11)**			-0.225 (-2.59)**	-0.253 (-2.92)**		
Constant	-1.806 (-0.64)	-0.752 (-0.23)	-1.168 (-0.60)	-0.573 (-0.25)	-2.927 (-2.25)**	-2.430 (-1.94)*	-4.726 (-4.69)**	-4.446 (-4.68)**	-3.154 (-2.36)**	-2.620 (-2.03)**	-4.823 (-4.65)**	-4.519 (-4.64)**
N	66	66	66	66	718	718	718	718	751	751	751	751
Model Chi-Square	12.11	9.78	11.34	9.5	36.01***	37.67***	24.07***	19.78***	34.6***	36.3***	23.81***	19.69***
R ²	0.141	0.137	0.139	0.137	0.087	0.077	0.075	0.063	0.084	0.076	0.074	0.063

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.

ferent from Singh (1990) and provide support more for the underperformance hypothesis than to the free cash flow hypothesis. Additionally, the uncontroversial evidence of higher cash flow volatility of LBO targets illustrate that unstable cash flows provide potential for cash flow improvements and stabilisation. Cash flow volatility shows strong significance for all tested samples. For MBOs the relationship is not as strong (significant in 6 of twelve models) as for other tested LBO groups. This finding indicates inability to generate stable, maximised cash flows and is therefore supportive for the underperformance hypothesis.

The main variables for operating efficiency showed that a significant relationship exists between operating efficiency and LBO probability. For LBOs and peer groups the asset turnover (ASTURN) is significant at 5% level in all four models. For the pooled sample as well as for the sample including LBOs and strategic mergers and acquisitions the EBIT_TA is significant at 1% level in all but one of the models (where it is significant at 5% level). However, EBIT_TA is not statistically significant for the peer groups and LBOs. Likewise, for non-MBO LBOs EBIT_TA is not significant at all in any of the 12 models. These findings are to some extent in line with prior studies. Singh (1990) shows that EBIT_TA variable is different for control groups and the relationship is similar as the present research documents for LBOs and strategic mergers and acquisitions.

The medium term growth variable (L2Y_GR) has a negative sign in all models, and is significant at 5% level in the sample of LBOs and peer groups. Shorter-term growth (LTM_GR) shows no significance, and has unexpected positive sign in the models where mergers and acquisitions are present. However, for MBOs the shorter-term growth is significant at 10% level. This suggests that there exists a relationship between a longer-term slow or negative growth and LBO probability and for shorter-term growth and MBOs. However, these results are not unambiguous. Prior studies have demonstrated controversial results of the relation between growth and LBO likelihood. Longer term growth measures show significance in Lehn & Poulsen's (1989) research where they test for average annual sales growth 4 years, 3 years and 2 years prior to buyout. In contrast, Singh (1990) tests for average growth rate over 3 years prior to buyout and documents insignificant results for growth. Controversial findings on growth may imply that the relationship between growth and LBO likelihood is secondary. Thus, slower growth may be a result of operating improvements rather than reason for LBO. As discussed in the theoretical section of this paper, a company experiencing slower growth should focus on resource allocation, cost cutting and operating improvements.

Maturity variable (MAT) is significant only in one case for the sample with LBOs and peer groups. For MBOs it is significant at 5% level in two of four models with peer groups. The sign of the coefficient is negative in all but three cases. The insignificance of the maturity variable in the regressions (and the lower mean for LBOs than peer groups) indicates that the sample LBOs have

had similar depreciation and amortisation in proportion to capital spending as the other sample groups. For a mature company, this ratio should be close to zero, as capital is spent mainly on maintenance of existing assets. The likely explanation for the maturity variable to have a low value for a LBO targets with slow or negative growth is that they have high maintenance capex in relation to EBITDA. Since the relatively low values for maturity variable for LBO targets may provide potential to cut back on capital spending or increase EBITDA this result can be interpreted as supportive to underperformance hypothesis. This result contradicts with Servaes (1994) who finds no evidence of overinvestment for firms that go private.

Both of the liquidity measures have signs opposite to those expected in all of the models. For LBOs and MBOs, whenever present they are both significant at least at 10% level with the exception of the regressions with only LBOs and peer groups. However, for non-MBO LBOs liquidity measures show no significance. Both the paired t-test on means and Wilcoxon signed rank test on medians showed statistically significant difference between LBOs and peer groups for LIQ2. Yet, the difference in LIQ1, which takes into consideration the net debt, was not significant at all. This implies that for LBOs the possibly existing agency costs of free cash on balance sheet could not be greater than for the peer group companies. Moreover, since strategic mergers and acquisitions companies had better liquidity at the time of transaction (signs opposite than expected) cash on balance sheet cannot explain the reason for a company to become an LBO target in the tested sample. Furthermore, lower growth of the LBOs (and MBOs) in the sample can be a result of inability to finance growth. This could explain the lower growth rates, but would not support the free cash flow hypothesis as for the reason of LBO. Thus, there exists growth options but the companies cannot explore them because they lack the financial resources needed.

LBOs in the sample have lower mean and median values for gearing compared to peer groups and strategic mergers and acquisitions. Gearing is significant in only one of the twelve regression models, and therefore shows very little overall significance for the likelihood of LBO. The sign of GEAR is negative as expected for LBOs and peer groups. For the pooled sample the sign is positive, and for the LBOs and strategic acquisitions it is negative in three cases and positive in one. In regressions with MBOs gearing shows strong significance in 7 models and has negative sign in 11 of the 12 models. The insignificance of the gearing level is inline with the results of Singh (1990). Low gearing (and negative sign) may indicate unoptimised capital structure leading to higher cost of capital and lower growth prospects as explained earlier in this paper in conjunction with the theoretical discussion around liquidity issues.

4.5. Reliability and validity discussion

As pointed out earlier in this paper, the aim of the present study is not to focus on the agency problems of free cash flow but to analyse the operating characteristics of LBOs, which should

reflect the existence of such problems. Although a number of studies have found evidence that support the free cash flow hypothesis, most of these studies investigate the post buyout period. The evidence reported in pre buyout studies is not consistent. Lehn & Poulsen (1989), Singh (1990) and Opler & Titman (1991) report support for free cash flow theory, but Maupin et al. (1984), Servaes (1994) and Kieschnick (1998) present opposite findings. The results of the present study are in line with the latter group providing no support for the free cash flow hypothesis. The reasons for this can be related to robustness, sample selection, time period of the study and geographic issues as well as to changes in capital markets related to LBOs.

Multicollinearity and influential variables can have a significant effect on the results of regressions in this type of study. For example, Kieschnick (1998) replicated Lehn & Poulsen's (1989) study by accounting for choice based sampling procedures and outliers. In contrast to the original research, Kieschnick finds no support for the free cash flow theory to be determining the odds of going private. The unadjusted data sample (raw data) of the present study had significant outliers. This problem was addressed by truncating variables at their 95th and 5th percentiles. The sample variance inflation factor (VIF) values of the present study to are below 4,4 indicating acceptable level of multicollinearity (VIF values not reported). The logistic regression models for the LBO sample are tested also with adjusted models, where the variables with highest VIF values are not present at the same time. As reported, this did not affect the results.

The selected variables of the present study do not include traditional corporate governance measures. This paper provides an in-depth view on the operating performance of LBOs. From traditional LBO research perspective, the relationship of cause and consequence is approached from the perspective of the outcome. After all, the operating characteristics should reflect the existence of agency problems.

The sample selection procedure may introduce biases of three sorts. Firstly, 759 LBOs were left out of the sample, because the database used did not contain information needed to calculate all of the variables or they we viewed as exceptional cases (as explained with sample selection). The selection criteria based on availability of data very important, because thorough analysis of operating characteristics requires the use of multi year averages for some variables. Reliable tests of cash flow volatility, maturity and growth cannot be done without multi year data. Secondly, 68% of the LBOs in the sample are UK companies, which can bias the results to reflect more the UK characteristics than general European conditions. Reporting and comparing UK LBOs to the pooled sample and to non-UK sample address this issue. There exists differences in the regression results between the groups, which allows to conclude that the whole LBO sample does not reflect only UK LBO characteristics. In addition, given that UK is by far the biggest LBO marker in Europe, it should have significant presence in a European LBO sample. Thirdly, the process of forming the matched peer groups can be biased. The 5 peer group companies for each LBO were

selected by matching three criteria: size, business model and industry sub sector as well as geographic origin. A number of LBOs had similar characteristics in terms of the selection criteria of the comparable companies and there was a lack of close comparable companies for certain industries and European countries. As a result there exist overlap between the peer groups of LBOs. Altogether, 166 comparable companies were used to construct 5 company peer groups for each of the 71 LBOs. This overlap may to some extent bias the results. However, the quality (in terms of close match) of comparable companies is essential in using comparable companies. This quality of peer groups was ensured in this research by allowing the peer groups to overlap.

5. CONCLUSIONS

This study examines the value creation of LBOs and operating characteristics of 71 European leveraged buyout targets that occurred during the years 1997–2003. The LBO sample is compared to 71 matched control groups of comparable companies as well as to a sample of 685 industry sub sector matched strategic mergers and acquisitions announced during the same time period as the sample LBOs. Empirical evidence is presented that the operating performance of LBO targets is different from that of the performance of a matched group of industry peers. In addition, cross-sectional regression analysis presented show that the likelihood for a company to be a leverage buyout target, instead of remaining public, or being acquired by another company is linked to the operating characteristics of the target companies. The robustness of the results is ensured in a number of different tests.

The presented results provide no support for Jensen's (Jensen, 1986) free cash flow theory that the agency problems associated with free cash flow would be the main driver for LBO activity. The operating characteristics of European buyouts do not reflect either the generation of excess cash flow or high liquidity position. However, the possible over investment in assets due to existence of agency problems cannot be controlled with the analysed variables.

The presented results suggest that LBO targets in Europe have been underperforming their industry peers. Hence, the primary source for value creation would be to improve and stabilise the cash flow generation of the LBO target to the same level as that of peer companies that is the level of performance the business model in question can support. Although not conclusive, the presented evidence support the introduced underperformance hypothesis, which states that a company becomes an attractive LBO target because its operating efficiency and cash generation can be improved without changing the scale of the operations of the target. In general, significant improvements in cash flows are required as well as improved exploration of the available growth options. These can be achieved partly by revising capital structure, as the gearing levels of European LBO targets are lower than their peers.

Overall, the results indicate that European LBO targets provide value creation opportunities through improved cash flow generation and growth. Typical LBO characteristics, when compared to industry peers and strategic transactions, are relatively low gearing, relatively low EBITDA margin, high cash flow volatility and relatively high operating profit and turnover on assets. These qualities provide less leverage capacity on cash flows, but real value creation potential through improved operating efficiency and growth.

The results show similar operating characteristics for MBOs, when they are analysed separately from non-management participated buyouts. The main difference between these two groups is that non-MBO LBOs typically have higher cash flow volatility and lower operating efficiency than MBOs. The reason for this can be that the acting management of the buyout target would not view a buyout as an attractive opportunity, unless they would believe that operating performance could be approved. On the other hand, especially shorter-term variables can be biased with MBOs as the management is likely to act in their own favour in the decision making before the entering actual transaction negotiations.

There are several possible explanations why the presented results do not support the free cash flow hypothesis. Firstly, there are number of research limitations that may affect the results. These are related to possible sample selection biases as well as to corporate governance related measures. In addition, the present research does not take into account whether or not a buyout is completed or successful. Secondly, the capital markets essential to buyout activity have changed significantly since the LBO boom of the 1980s and the competitive landscape of LBO markets has change. This has changed the nature of LBO markets and has likely had an affect also on the characteristics of LBO targets. In particular, the availability of capital to buyout funds that has led to record levels of fundraising activity has forced LBO investors to seek suitable LBO investments beyond the traditional field of targets. In the reshaped LBO markets, the underperformance hypothesis seems to explain much of the characteristics of LBO targets. ■

REFERENCES

- AMBROSE, BRENT W. and WINTERS, DREW B.**, 1992, Does an industry effect exist for leveraged buyouts?, *Financial Management*, vol. 21, no. 1, p. 89–101.
- AMESS, KEVIN**, 2002, Management buyouts and firm level productivity: Evidence from a panel of U.K Manufacturing firms, *Journal of Industrial Economics*, vol. 51, no. 1, p. 35–45.
- BAE, SUNG C. and JO, HOJE**, 2002, Consolidating corporate control: Divisional versus whole-company leveraged buyouts, *Journal of Financial Research*, vol. 25, iss. 2, p. 247–263.
- BAKER, GEORGE P. and WRUCK, KAREN H.**, 1989, Organizational Changes and Value Creation in Leveraged Buy-Outs: The case of O.M. Scott & Sons Company, *Journal of Financial Economics*, vol. 25, no. 2, p. 163–190.
- BRUTON, GARRY D., KEELSC, KAY J. and SCIFRES, ELTON L.**, 2002, Corporate restructuring and performance: An agency perspective on the complete buyout cycle, *Journal of Business Research*, vol. 55, iss. 9, p. 709–724.

- BULL, IVAN**, 1989, Financial Performance of Leveraged Buyouts: An Empirical Analysis, *Journal of Business Venturing*, vol. 4, p. 263–289.
- CHEVALIER, JUDITH, A.**, 1995, Do LBO supermarkets charge more? An Empirical analysis of the effects of LBOs on supermarket pricing, *Journal of Finance*, vol. 50, iss. 4, p. 1095–1112.
- COTTER, JAMES F. and PECK, SARAH W.**, 2001, The structure of debt and active equity investors: The case of the buyout specialist, *Journal of Financial Economics*, vol. 59, iss.1, p. 101–148.
- DEANGELO, HARRY, DEANGELO, LINDA and RICE EDWARD M.**, 1984, Going Private: Minority Freezeouts and Shareholder Wealth, *Journal of Law and Economics*, vol. 27 (October), p. 367–401.
- DEANGELO, LINDA E.**, 1986, Accounting numbers as Market Valuation Substitutes: A Study of Management Buyouts of Public Shareholders, *Accounting Review*, vol. 61, no. 3 (July), p. 400–420.
- DESBRIÈRES, PHILIPPE and SCHATT, ALAIN**, 2002, The Impacts of LBOs on the Performance of Acquired Firms: The French Case, *Journal of Business Finance & Accounting*, vol. 29, iss.5/6, p. 695–730.
- EASTERWOOD, JOHN C., SETH, ANJU and SINGER, RONALD F.**, 1989, The Impact of Leveraged buyouts on Strategic Direction, *California Management Review*, vol. 31, no. 1 (Fall), p. 30–43.
- HALL, BRONWYN H.**, 1990, The Impact of Corporate Restructuring on Industrial Research and Development, *Brookings Papers on Economic Activity*, Special Issue Microeconomics, p. 85–135.
- HALPERN, PAUL, KIESCHNICK, ROBERT and ROTENBERG, WENDY**, 1999, On the Heterogeneity of Leveraged Going Private Transactions, *Review of Financial Studies*, Summer, vol. 12, no. 2, p. 281–309.
- HARPER, NEIL and SCHNEIDER, ANTOON**, 2004, Private equity's new challenge, *McKinsey on Finance*, no. 12 (Summer), p. 1–5.
- HITE, GAILEN L. and OWERS, JAMES E.**, 1983, Security Price Reactions AROUND Corporate Spin-off Announcements, *Journal of Financial Economics*, 12, 409–436.
- HITE, GAILEN L. and VETSUYPENS, MICHAEL R.**, 1989, Management Buy-Outs of Divisions and Shareholder Wealth, *Journal of Finance*, vol. 44, no. 4 (September), p. 953–970.
- HOLTHAUSEN, ROBERT W. and LACKER, DAVID F.**, 1996, The financial Performance of Reverse Leveraged Buyouts, *Journal of Financial Economics*, vol. 42, no. 3 (November), p. 293–332.
- JELIC, RANKO, SAADOUNI, BRAHIM and WRIGHT, MIKE**, 2002, Performance of Private to Public and Reverse MBOs – The Role of Venture Capital, *working paper*, The University of Birmingham.
- JENSEN, MICHAEL**, 1986, Agency Costs of Free Cash Flow, Corporate Finance, and Takeovers, *American Economic Review*; vol. 76, no. 2, p. 323–329.
- KAPLAN, STEVEN N.**, 1989, The Effects of Management Buyouts on Operating Performance and Value, *Journal of Financial Economics*, vol. 24, no. 2 (November), p. 217–254.
- KIM, MOONCHUL and RITTER, JAY R.**, 1999, Valuing IPOs, *Journal of Financial Economics*, vol. 53, no. 3, p. 409–438.
- KIESCHNICK, ROBERT**, 1998, Free cash flow and stockholder gains in going private transactions revisited, *Journal of Business Finance & Accounting*, vol. 25, no. 1/2, p.187–203.
- KITCHING, JOHN**, 1989, Early Returns on LBOs: A Transatlantic Study Sheds New Light on how and Why They Work, *Harvard Business Review*, vol. 67, no. 6 (Nov–Dec), p. 74–81.
- KOVENOCK, DAN and PHILLIPS, GORDON**, 1997, Capital Structure and Product Market Behavior: An Examination of Plant Exit and Investment Decisions, *Review of Financial Studies*, vol. 10, iss. 3, p. 767–803.
- LEE, D. SCOTT**, 1992, Management Buyout Proposals and Inside Information, *Journal of Finance*, vol. 47, no. 3 (July), p. 1061–1079.
- LEHN, KENNETH and POULSEN, ANNETTE**, 1989, Free Cash Flow and Stockholder Gains in Going Private Transactions, *Journal of Finance*, vol. 44 (June), p. 771–788.
- LICHTENBERG, FRANK and SIEGEL, DONALD**, 1990, The Effects of Leveraged Buyouts on Productivity and Related Aspects of Firm Behaviour, *Journal of Financial Economics*, vol. 27 (September), p. 165–194.
- LONG, WILLIAM and RAVENS CRAFT, DAVID J.**, 1993, LBOs, Debate and R&D Intensity, *Strategic Management Journal*, vol. 14 (Summer Special Issue), p. 119–135.
- LOWENSTEIN, LOUIS**, 1985, Management Buyouts, *Columbia Law Review*, 85, 730–784.

- LOWENSTEIN, LOUIS**, 1986, No More Cozy Management Buyouts, *Harvard Business Review*, January–February, 147–156.
- MUSCARELLA, CHRIS J. and VETSUYPENS, MICHAEL R.**, 1990, Efficiency and Organizational Structure: A study of Reverse LBOs, *Journal of Finance*, vol. 45, no. 5 (December), p. 1389–1413.
- OFEK, ELI**, 1994, Efficiency Gains in Unsuccessful Management Buyouts, *Journal of Finance*, vol. 49, no. 2 (June), p. 637.
- OPLER TIM C.**, 1992, Operating Performance in Leveraged Buyouts: Evidence from 1985–1989, *Financial Management*, Spring, p. 27–34.
- OPLER TIM C.**, 1993, Controlling Financial Distress Costs in Leveraged Buyouts With Financial Innovation, *Financial Management*, 22, 37–41.
- OPLER, TIM C. and TITMAN, SHERIDAN**, 1991, The Characteristics of Leveraged Buyout Firms, *UCLA working paper*, 9–91.
- OPLER, TIM C. and TITMAN, SHERIDAN**, 1993, The Determinants of Leveraged Buy-out Activity: Free Cash Flow vs. Financial Distress Costs, *Journal of Finance*, vol. 48 Issue 5, 1985–1999.
- SAADOUNI, B., MALLIN, C. A., and BRISTON, R. J.**, 1995, Management Buyout Announcements and Securities Returns in the U.K.: Further Evidence for the Period 1981–91, *Applied Financial Economics*, vol. 5, iss. 4, p. 243–50.
- SERVAES, HENRI**, 1994, Do Takeover Targets Overinvest?, *Review of Financial Studies*, Summer 1994, vol. 7, iss. 2, p. 253–77.
- SINGH, HARBIR**, 1990, Management Buyouts: Distinguishing Characteristics and Operating Changes Prior to Public Offering, *Strategic Management Journal*, vol. 11, Special Issue, p.111.
- SMITH, ABBIE J.**, 1990, Corporate Ownership and Performance: The Case of Management Buyouts, *Journal of Financial Economics*, vol. 27 (September), p. 143–164.
- THOMPSON, STEVE and WRIGHT, MIKE**, 1991, UK Management Buyouts: Debt, Equity Agency Cost Implications, *Managerial and Decision Economics*, vol. 12, no. 1 (February), p. 15–26.
- WRIGHT, MIKE and ROBBIE, KEN**, 1998, Venture capital and private equity: a review and synthesis, *Journal of business finance and accounting*, vol. 25, no. 5–6, p. 521–571.
- WRIGHT, MIKE, HOSKISSON, ROBERT E. and BUSENITZ, LOWELL W.**, 2001, Firm rebirth: Buyouts as facilitators of strategic growth and entrepreneurship, *Academy of Management Executive*, vol. 15, Iss. 1, p. 111–126.

APPENDIX 1. Correlation matrixes.

The table presents correlation between the tested variables for 71 European LBOs, 71 peer groups and 685 strategic European acquisitions. The variables are latest twelve months (LTM) revenue growth (LTM_GR), cumulative annual growth rate of last 2 years revenue growth (L2Y_GR), LTM EBITDA margin (EBITDAM), LTM EBIT divided by total assets (EBIT_TA), standard deviation of last 3 years EBITDA margin (CF_VOL), average of past 2 years depreciation & amortisation as a proportion of capex (MAT), LTM sales divided by total assets at announcement (ASTURN), net debt divided by total assets (LIQ1), cash & marketable securities divided by total assets (LIQ2), total debt divided by shareholders equity (GEAR) and natural logarithm of LTM revenue (SIZE).

Panel A: LBOs and Peer Groups; Correlation between the tested variables

N=142	LTM_GR	L2Y_GR	EBITDAM	EBIT_TA	CF_VOL	MAT	ASTURN	LIQ1	LIQ2	GEAR	SIZE
LTM_GR	1.000										
L2Y_GR	0.783***	1.000									
EBITDAM	0.153*	0.174**	1.000								
EBIT_TA	0.056	0.078	0.319***	1.000							
CF_VOL	-0.044	0.035	0.213***	0.092	1.000						
MAT	0.021	0.127	0.162*	0.214***	-0.005	1.000					
ASTURN	-0.033	-0.063	-0.734***	0.056	-0.105	-0.129	1.000				
LIQ1	-0.048	-0.061	0.071	-0.336***	-0.013	-0.207***	-0.209	1.000			
LIQ2	-0.019	0.005	0.127	0.164***	0.138	0.189***	-0.125	-0.586***	1.000		
GEAR	-0.051	-0.046	0.040	-0.395***	-0.024	-0.051	-0.225***	0.657***	-0.158*	1.000	
SIZE	-0.149*	-0.201**	-0.226***	-0.222***	-0.244***	0.001	0.104	0.159*	-0.036	0.205**	1.000

Panel B: LBOs and Strategic Acquisitions; Correlation between the tested variables

N=756	ltm_gr	l2y_gr	ebitdam	ebit_ta	cf_vol	mat	asturn	liq1	liq2	gear	size
ltm_gr	1.000										
l2y_gr	0.782***	1.000									
ebitdam	0.042	0.050	1.000								
ebit_ta	0.131***	0.123***	0.126***	1.000							
cf_vol	0.002	-0.024	0.421***	0.002	1.000						
mat	-0.109***	-0.120***	-0.259***	-0.074**	-0.060*	1.000					
asturn	0.027	-0.001	-0.657***	0.254***	-0.284***	0.183***	1.000				
liq1	0.0611*	0.090**	0.284***	-0.209***	0.028	-0.158***	-0.322***	1.000			
liq2	-0.132***	-0.154***	-0.126***	0.106***	0.059	0.051	0.061*	-0.605***	1.000		
gear	0.050	0.048	0.120***	-0.311***	-0.049	-0.115***	-0.240***	0.694***	-0.174***	1.000	
size	-0.094***	-0.102***	-0.306***	-0.140***	-0.314***	-0.022	0.118***	-0.005	0.006	0.194***	1.000

Panel C: LBOs, Peer Groups and Strategic Acquisitions; Correlation between the tested variables

N=827	LTM_GR	L2Y_GR	EBITDAM	EBIT_TA	CF_VOL	MAT	ASTURN	LIQ1	LIQ2	GEAR	SIZE
LTM_GR	1.000										
L2Y_GR	0.783***	1.000									
EBITDAM	0.054	0.064*	1.000								
EBIT_TA	0.144***	0.153***	0.140***	1.000							
CF_VOL	0.004	-0.021	0.417***	0.002	1.000						
MAT	-0.042	-0.041	-0.185***	0.007	-0.048	1.000					
ASTURN	0.011	-0.018	-0.665***	0.226***	-0.283***	0.124***	1.000				
LIQ1	0.059*	0.081**	0.274***	-0.222***	0.026	-0.165***	-0.315***	1.000			
LIQ2	-0.120***	-0.142***	-0.118***	0.113***	0.062*	0.080**	0.058*	-0.607***	1.000		
GEAR	0.047	0.038	0.117***	-0.317***	-0.046	-0.109***	-0.239***	0.689***	-0.175***	1.000	
SIZE	-0.110***	-0.121***	-0.299***	-0.146***	-0.308***	-0.053	0.122***	-0.005	0.002	0.172***	1.000

*** Statistically significant at 1% confidence level.

** Statistically significant at 5% confidence level.

* Statistically significant at 10% confidence level.