The Wealth Effects of public-to-private LBOs: Evidence from Europe

Apostolos Dasilas

Department of Applied Informatics

University of Macedonia

156 Egnatia str., P.O. Box 1591

54636 Thessaloniki, Greece

Tel: +30-231 089-1848

E-mail: dasilas@uom.gr

and

Chris Grose

School of Economics, Business Administration and Legal Studies

International Hellenic University

14th klm Thessaloniki-Moudania, 57001 Thessaloniki, Greece

Tel: +30 231 047-4579

E-mail: c.grose@ihu.edu.gr

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Abstract

This study examines various features of leveraged public-to-private institutional buyouts in Europe that occurred between 1998 and 2016. We find significant excess returns of about 7.7% on the LBO announcement date. We also find evidence that LBOs harbored in countries with strong corporate governance mechanisms elicit greater wealth effects for shareholders of targets. Consistent with the free cash flow hypothesis, abundance of cash appears to be one of the driving forces of excess short-term returns. Looking at the characteristics of LBO targets, we show that mature companies with excess cash flows and less volatility seem to be candidates for LBO deals.

JEL Classifications: G24, G32, G34

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1 Introduction

In the last three decades the number of firms deciding on exiting equity markets has increased as a result of the high costs associated with retaining the public status.[1] The tightening of the regulatory framework and the increased scrutiny associated with it has also been blamed for this growing exit tendency (Thomsen and Vinten, 2014). However, the decision of going private is relatively new and less studied for European countries other than the UK. In fact, the widespread surge in the public-to-private transactions started in 2000 for the majority of Continental European countries (Geranio and Zanotti, 2012). Among the several ways of going private, leveraged buyouts (LBOs) have remained popular since the 1980s, mainly in the US, which has long attracted the lion's share of capital raised for buyouts. However, the LBO market was marked by a period of stagnation in the 1990s before the new wave burst by the early of 2000s (Cao et al., 2016).

While the mergers and acquisitions (M&A) market was active for several years in Europe, the buyouts financed primarily with debt were less developed for Continental Europe. However, the prospects for the formation of a single-currency economic area by the end of the 1990s and the subsequent decrease in interest rates and borrowing costs facilitated the use of substantial debt to finance medium- and large-sized buyouts in Europe. The low cost of debt was at the heart of the mortgage lending boom which allowed many private equity firms and corporate investors to be involved in an LBO transaction. As a result, the European LBO market increased significantly in terms of volume and value towards the end of 1990s. LBO transactions represented the main activity area for the private equity industry, with over 50% of the capital raised earmarked to LBOs.

Compared to the US and partly to the UK market, the European markets present some idiosyncrasies that may affect the pattern and the result of a buyout. One idiosyncrasy is the governance structure of Continental European firms, which is characterized by the concentrated ownership, often family-based (Geranio and Zanotti, 2012). Also, there is the agency problem issue, involving not only the management but also controlling and minority shareholders (Boubaker et al., 2014). Under such corporate governance and ownership structure regimes major shareholders are privy to inside information. This in turn may lead to opportunistic behavior on the eve of an LBO announcement at the expense of minority shareholders. As Tirole (2006) asserts, LBOs may be perceived as governance instrument of

[1] For example, commissions paid to the market management company (e.g., Euronext, Borsa Italiana), annual registration fees and costs linked to meet disclosure obligations, such as the announcement of quarterly financial reports and public announcements on sensitive information (Geranio and Zanotti, 2012).

the market of corporate control and essentially create "a new and superior form" of corporate governance (Cao et al., 2015, p. 70). Another distinct feature of the European markets is the recent surge of such deals involving the private equity industry. The latter is alleged to be responsible for the buoyant LBO growth in 2000s and onwards[2]. However, even though a delisting of a public firm is amongst the core activities of a private equity fund in the US, this is only considered a side effect for a private equity fund in Europe (Geranio and Zanotti, 2012). Therefore, the so-called club deals, in which two or more private equity firms jointly sponsor an LBO, may more easily find fertile ground in the European LBO market. Finally, the European capital market authorities have not yet harmonized regulation with respect to the tax and accounting treatment of going private transactions as well as the protection of minority shareholders from such deals. As a result, different levels of auditing standards as well as shareholder and investor protection exist and, therefore, heterogeneous market reaction is expected from public-to-private transactions.

Though there is ample empirical evidence on the wealth effects emanating from public-to-private transactions financed by the extensive use of leverage in the US, the evidence from Europe, especially from the Continental one, is limited (e.g., Andres et al., 2007; Renneboog et al., 2007, Geranio and Zanotti, 2012; Achleitner et al., 2013; Boubaker et al., 2014). The current study attempts to fill this void by probing into the wealth effects of 137 medium and large-sized public-to-private transactions financed by debt that took place in Europe between 1998 and 2016. In specific, we explore the market response to the announcement of public-to-private LBOs and the potential returns opportunities[3] arising for pre-buyout shareholders. Following recent evidence from the US LBO market (see Officer et al., 2010), our study attempts to reveal differential market reaction in Europe between two distinct types of LBOs, that is, club deals and sole-sponsored. The heterogeneous protection of all investors and shareholders of European firms when deciding on going private is also considered in this paper. In particular, we relate governance mechanisms at the county level with the wealth effects emanating from LBO announcements and show how governance structures influence the effectiveness of LBOs as a market of corporate control. Finally, we examine the determinants of publicly traded companies going private via an LBO by using

[2] 80% of the capital raised by private equity in 2006 was aimed at LBOs (ECB, 2007).

[3] According to Frankfurter and Kosedag (1996), there is no single source of gain responsible for the wealth effects of LBOs, though findings tend to support that the most important ones are the elimination of public reporting expenses and agency costs, alignment of managerial interests with company objectives, monitoring by sponsors/ buyout specialists, and tax savings.

logistic regression analysis. In particular, we unveil the major characteristics of target firms that increase the likelihood of an LBO transaction by forming a control sample of firms that did not go private and comparing the financial characteristics of the two groups of firms.

Our paper contributes to the LBO literature by providing evidence on the role of governance structures in determining wealth gains from public-to-private transactions with an emphasis on institutional buyouts. In particular, we emphasize on differences in the influence of auditing standards, protection of minority shareholders' interests, efficacy of corporate boards and strength of investor protection on European LBOs. Chaplinsky and Ramchand (2012) claim that after SOX governance structure is a major force driving buyouts and delistings. According to Rossi and Volpin (2004), stronger accounting and investor protection standards positively influence buyout activity. Therefore, the investigation of the wealth effects in relation to governance structures makes the current study appealing.

Second, the present study adds a new dimension to the strand of literature on going private transactions by exploring the effect of sole-sponsored versus club LBO deals on the shareholders gains surrounding European LBOs. To the best of our knowledge, the study of Officer et al. (2010) is the only one that investigates the role of a sponsor in the US LBO market. According to Officer et al. (2010, p. 215), "there are concerns about club deals that private equity partnerships maybe colluding to depress prices by limiting the number of competing bidders in an auction for a takeover target, and thereby may be shortchanging passive, dispersed shareholders of target publicly traded corporations". We trust that European deals provide an excellent laboratory to investigate different types of public-to-private transactions since public firms in Continental Europe are characterized by less ownership dispersion (Boubaker et al., 2014).

Third, this is the first study in the strand of LBO literature that adopts the propensity score matching (PSM) to address the problem of selection bias in multivariate regression analysis. In fact, PSM helps multivariate regressions to properly specify the relation between outcome (wealth effects in our case) and explanatory variables to obtain unbiased estimates (Shipman et al., 2017). The problem of selection bias is more evident when analyzing international data from different countries and there is an overrepresentation of one country. The current study employs a dataset of LBOs, especially institutional buyouts, from the UK and Continental Europe where more than half of deals come from the former. To ensure that our results are not UK driven, we apply the PSM and derive robust results.

Our results show that European LBOs still create value to pre-buyout shareholders. However, the wealth gains seem comparatively smaller than those documented for LBO deals in the US market. When examining the market response to club LBOs vis-à-vis sole-sponsored deals we did not identify marked differences between the two types of LBO deals. These findings contradict recent evidence from the US market where bidder collusion among private equity partnerships is alleged to drive down prices by limiting the number of competing bidders in an auction for a takeover. Our results also lend support to the free cash flow hypothesis according to which firms with agency conflict of interests over the distribution of cash surplus prefer to go private through LBOs. The subsequent substantial debt servicing costs reduce the amount of free cash. Results also show that the strength of auditing and reporting standards, as well as that of investor protection, found primarily in the UK, collectively seem to explain the differential market reaction to LBO announcements. Moreover, undervaluation, deal and firm size also play a significant role in construing wealth effects from LBO announcements. Finally, the logistic analysis reveals that capital expenditure requirements and cash flow volatility are negatively associated with the probability of going private through LBOs, while prior to buyout operating profitability increases the likelihood of an LBO.

The paper is organized as following. Section 2 provides a review of the pertinent literature and develops the main research hypotheses of the study. Section 3 describes the data selection process and the methodology employed. Section 4 reports the empirical results, while Section 5 summarises the conclusions of the study.

2 Literature Review and Hypotheses Development

In contrast to involuntary delistings, LBOs are unanimously considered by the pertinent literature as distinct cases. Their voluntary nature that is considered to create value in various ways, ranging from operating performance to reduced agency costs, appears to elicit positive short-term announcement returns. The above holds for both US (Guo et al., 2011 and Cao et al., 2016 in recent years) and European samples (Andres et al., 2007; Renneboog et al., 2007; Achleitner et al., 2013; Boubaker et al., 2014). We therefore conjecture that the following hypothesis should hold.

H_1: LBO announcements elicit positive short-term returns for target companies.

The role of inside and controlling shareholders in explaining wealth gains surrounding LBO transactions has been long recognized by prior literature (see Croci and Del Giudice, 2014

among others). However, the role of investor and shareholder protection, as well as other governance structures of countries that host LBO transactions in explaining stock price gains, has not been fully examined. The distinct characteristics in ownership structure and the ensuing agency problems between UK and Continental European firms necessitate the investigation of the governance structures as potential drivers of LBO wealth effects. Jarrell and Brandley (1980) find that strong investor protection regulation, intended to safeguard target shareholders during takeovers, results in higher premiums paid to target shareholders. Moreover, Rossi and Volpin (2004) claim that stronger shareholder protection drives M&A bid premiums upward. This happens since the reduced cost of capital, stemming from the greater investor protection, induces the winning bidder to offer incentives to target shareholders in order to beat the competing bidders. The role of corporate governance on the nature of shareholders' wealth effects is further investigated in Andres et al. (2007) through a sample of European public-to-private LBOs. The irrevocable evidence of significant wealth gains for shareholders on the LBO announcement day is influenced by corporate governance attributes such as potential agency conflicts in the buyout firms[4]. The marked effect of governance mechanisms on the short-term abnormal returns following corporate restructurings is also highlighted in Betzer et al. (2015). Based on the above evidence, we conjecture that governance structures proxied by the strength of auditing and reporting standards, the protection of minority shareholders' interest, the efficacy of corporate boards and the strength of investor protection, in the target company market, significantly influence the wealth effects emanating from LBOs.

H_2: The wealth gains from LBO transactions are positively related to the strength of governance structures of target countries.

The pivotal role of private equity in LBO deals has been well identified in the pertinent literature (i.e. Officer et al., 2010; Cao et al., 2015). Very often, takeover targets attempt to trigger an auction on the part of potential bidders who in turn try to lure the passive and dispersed shareholders of target firms by offering significant bid premiums. Medium- and large-sized LBOs usually require substantial amount of debt that no single private equity firm or investor is able to offer. Under capital constraints, two or more private equity partnerships jointly sponsor large LBO transactions in the so-called club deals. Even if

[4] With regard to the agency theory, the results showed that companies with more scattered shareholdings and less intense monitoring experience higher returns.

capital constraints do not deter private equity from financing LBOs, diversification benefits may also induce funds to syndicate sufficiently large or risky deals (Officer et al., 2010). However, there are concerns about club deals in the sense that private equity funds may collude in order to depress prices by decreasing the number of competing bidders. The reduction in bid competition will unavoidably result in offering lower premiums for target shareholders (ibid). However, the ownership dispersion of Continental European firms is much lower than that in the US and therefore, it is quite difficult to shortchange major shareholders by offering low premiums to them. Therefore, we expect club deals to be positively related to the size of the premiums offered and capital gains generated.

H_3: The wealth gains from LBO transactions are positively related to club deals.

The considerable development of public-to-private activity in the US market during the 1980s motivated several academics to study the driving forces of the gains earned by pre-buyout shareholders. Lehn and Poulsen (1989) found that firms opting for going private via an LBO transaction have greater free cash flow compared to firms remaining listed. This was a clear evidence of the free cash flow hypothesis of Jensen (1986), according to which companies with high ownership dispersion suffer from conflicts of interests between managers and shareholders and have a tendency to spend free cash flows on projects that do not yield positive NPV. Therefore, an LBO may be triggered as an opportunity to return free cash to shareholders. Geranio and Zanotti (2012) found that the wealth gains emanating from European public-to-private (PTP) deals are positively related to the cash flow generated by the company. They argue that the high availability of cash flows is the lure for buyers to take the company private. Similarly, Boubaker et al. (2014) found support for the free cash flow hypothesis stating that firms with higher levels of pre-buyout free cash flows benefit from the going private transaction, especially in LBO cases. In light of the above empirical evidence and discussion, we propose the fourth hypothesis.

H_4: The wealth gains from LBO transactions are positively related to the level of the pre-buyout free cash flow of targets.

How leverage affects stock prices remains an unresolved issue for many years. This issue is more evident in acquisitions that require debt financing. According to Jensen (1986), debt can be used as a monitoring mechanism for managers who intend to invest firms' funds in wasteful projects. Consequently, the prospects of a company to increase debt enhance firm value, particularly in firms with large cash flows and low growth prospects. In addition, less

leveraged firms represent a good opportunity for potential bidders to structure more easily an LBO in order to acquire the company without encountering high financial risk. Recent evidence (i.e. Croci and Del Giudice, 2014) confirms the negative relationship between pre-buyout leverage and market reaction to public-to-private transactions. A similar relationship is expected to be found in this dataset.

H_5: The wealth gains from LBO transactions are negatively related to the level of the pre-buyout leverage of targets.

It is well known that debt provides tax incentives for firms making use of it. This incentive takes the form of interest deductibility resulting from the substantial increase in corporate debt embedded in LBOs. Therefore, the interest tax shield could be another possible source of shareholder wealth gains from LBO transactions. Lehn and Poulsen (1989) and Kaplan (1989) lend support to this hypothesis. Following Boubaker et al. (2014), we capture tax shields by using the taxes-to-sales ratio as an explanatory variable. We expect a positive relationship between wealth gains on the LBO announcement day and taxes-to-sales ratio.

H_6: The wealth gains from LBO transactions are positively related to the ratio of taxes-to-sales.

Stock prices do not always reflect the intrinsic value of a company, thus considering it over- or undervalued. However, undervaluation is claimed to be one of the most important factors which may induce management and controlling shareholders towards turning a company private. In specific, a depressed stock price does not facilitate the company from raising new equity funds from the market when considering the flotation costs. Moreover, companies that appear undervalued are less likely to attract institutional investors and may induce the existing shareholders to liquidate their portfolio of shares (Geranio and Zanotti, 2012). On the other hand, undervalued companies are well-suited LBO targets since they clearly cost relatively less to acquire. The ensuing restructuring of these companies will be beneficial to both acquirers and targets, thus inducing notable wealth effects at the announcement date. Undervaluation of target firms' stock prices was found to construe wealth effects of LBOs in the UK (Weir et al., 2005; Renneboog et al., 2007) and Continental Europe (Andres et al., 2005; Geranio and Zanotti, 2012; Croci and Del Giudice, 2014). Therefore, we expect a negative relationship between abnormal returns on LBO announcements and undervaluation.

H_7: The wealth gains from LBO transactions are negatively related to the undervaluation.

For small- and medium-sized companies, undervaluation may be even more apparent considering public market information costs (Grossman and Stiglitz, 1980) and investor characteristics (Geranio and Zanotti, 2012). Compared to the US companies, the European ones are smaller in size and have a more concentrated shareholder base. These two market characteristics may result in illiquidity and lack of interest by analysts and institutional investors (Geranio and Zanotti, 2012). According to Arbel and Strebel (1982), firms less covered by financial analysts suffer from information asymmetry. To overcome this disadvantage, they look for higher returns. Moreover, Kim and Lyn (1991) have found that increased information asymmetry is due to the corporate restructuring activities of LBOs. However, the costs of going private are in parallel with firm size, while those of information asymmetry are at odds with firm size, therefore, small firms can gain more by going private. Recent evidence from the international LBO market (i.e. Croci and Del Giudice, 2014; Boubaker et al., 2014; Cao et al., 2016) confirm the negative relationship between the wealth effects from private-to-public announcements and the size of the target firm. Therefore, we expect a similar relationship.

H_8: The wealth gains from LBO transactions are negatively related to target company size.

According to Jensen's (1989) agency theory, firms with low growth opportunities are inclined to invest their current cash in projects with negative NPV. Therefore, an LBO transaction may be regarded as the mechanism which disciplines firm managers by forcing them to stop investing money into wasteful projects. Consequently, firms that lack profitable opportunities may exploit potential gains from going private. Opler and Titman (1993), Carow and Roden (1997) and Cao et al. (2016), using Tobin's Q, found that firms with low growth opportunities (low Tobin's Q) enjoy higher wealth gains on LBO announcements. Employing Tobin's Q as a proxy of growth opportunities we expect a negative relationship between growth opportunities and market reaction to the LBO announcement.

H_9: The wealth gains from LBO transactions are negatively related to growth opportunities of targets.

According to Grammatikos and Swary (1986), firms' risk could also explain the wealth gains from the LBO transaction. The rationale behind this claim is that low risk firms have a greater potential for leveraging. In other words, these firms may have a greater debt capacity for leveraging and more to gain from the associated tax shields. Consistent with this hypothesis, Grammatikos and Swary (1986) and Carow and Roden (1997) find that the firms

with lower risk experience stronger market reaction surrounding the announcement of an LBO. A similar relationship is also expected in the current study.

H_{10}: The wealth gains from LBO transactions are negatively related to the pre-buyout risk of targets.

3 Research Design

3.1 Sample selection

The focus of the current study is the medium- and large-sized public-to-private LBOs that were announced in Europe between 1998 and 2016. All our sample LBO deals are institutional buyouts (IBOs), that is, the acquirer(s) are institutional investors and/or private equities. Medium- and large-sized LBOs are defined those with an enterprise value of at least €100 million and are alleged to be much more diversified than small-sized LBOs (Demaria, 2013). Similarly to Guo et al. (2011) for the US LBO market, we formed a sample of leveraged public-to-private institutional buyouts of European firms with deal values of at least $100 million[5]. The reason for restricting our sample to medium- and large-sized European institutional buyouts is the ownership dispersion of these target firms and the differential investor protection that enjoy major and minor shareholders in Europe. Following Andres et al. (2007), Officer et al. (2010) and Cao et al. (2015), we included all leveraged public-to-private institutional buyouts where the acquirer was seeking to own ≥ 50% of the target's outstanding shares and the debt financing accounted for ≥ 50% of the total transaction. To ensure that all LBO transactions were complete acquisitions, we required a delisting event subsequent to the LBO. We excluded LBO deals where targets are either financial firms or regulated utilities. Finally, we excluded buyouts for which sufficient financial or stock data of the acquired firms was not available. This procedure rendered a final sample of 137 transactions for which the announcement effects on pre-buyout shareholders' wealth can be investigated. LBOs announcement dates and deal characteristics were obtained from Thomson One database. Stock prices and fundamentals of the target firms were culled from Bloomberg.

Table 1 displays the distribution of our sample of LBOs by year, country of origin and industry. We observe that the number of LBOs is mostly concentrated in two periods: 1999-2001 and 2006-2007, suggesting that public-to-private deals are closely related to favorable capital market conditions. LBO market activity seems to unprecedentedly slow down after

[5] Worldwide in 2014, one out of every five buyouts was valued at between $250 million and $500 million (Bain and Company, 2015).

the financial markets turmoil in 2008. Regarding the geographic distribution of leveraged public-to-private institutional buyouts, the UK market dominates European LBOs with 94 deals followed by Sweden and Ireland with 9 and 8 deals each, respectively. The clear dominance of the UK companies in the sample is evident in studies which set similar data filtering criteria (see, for example, Betzer, 2006; Andres et al., 2007). The rest of the LBO deals are scattered across other European countries. The average transaction value for the whole period is 1,201.34 million dollars while the median value is 407.84 million dollars.

[Insert Table 1 here]

Another objective of the current study is the investigation of the nature of the relationship between firm characteristics and the likelihood of an LBO. To test the above relationship, following Nikoskelainen (2006), for each buyout firm a matching group of five companies that did not go private was assigned (control firms). A matching company was selected after meeting the following three criteria: a) First and foremost, it belongs to the same four-digit sector as the target; b) each matching firm has the same size as the target. For that reason, companies with revenues of ≥ 100% or ≤ 50% of the sample buyout firm were excluded from the initial peer candidates' sample; c) ROA one year prior to the LBO is in the ±50% bracket of the ROA of the target company. In the case where more than five companies met those criteria, the final group of control firms was formed by preferably selecting companies of the same country or of similar size.

Since we also wish to delve into the impact of governance structures on the wealth effects generated by LBO announcements, we incorporate governance variables corresponding to the country of domicile of the respective LBO target firms. Our governance data was extracted from the Global Competitiveness Report[6] issued by the World Economic Forum which covers different facets of economic activity in 148 countries worldwide.

3.2 Methodology

In order to capture possible wealth effects stemming from public-to-private LBO announcement days, we employ the classical event study methodology. The event window for calculating abnormal returns spans from -10 days to +10 days with respect to the

[6] http://www3.weforum.org/docs/gcr/2015-2016/Global_Competitiveness_Report_2015-2016.pdf

announcement day (day 0), whereas the estimation period used for the calculation of the market model parameters is defined as [-250, -11]. We calculate average abnormal returns (AARs) around the event window using both the market model and the market-adjusted model (Brown and Warner, 1985). We also compute Cumulative Abnormal Returns (CARs) for each company that are averaged among all the sample companies to obtain Cumulative Average Abnormal Returns (CAARs). We test the statistical significance of AARs and CAARs using parametric t-tests by Campbell et al. (1997).

We attempt to detect the determinants of the LBO wealth effects to pre-buyout shareholders by using pooled cross-sectional regression analysis. We regress abnormal returns at the LBO deal announcement date against a gamut of independent variables as the pertinent literature suggests. We also regress raw premiums and market adjusted-premiums paid[7] to pre-buyout shareholders against the same independent variables (see Boubaker et al., 2014). Below we present the explanatory variables used in our model:

FCF assesses the cash flow profile of the target firm and shows whether companies with a high potential to misuse their cash flow enjoy higher abnormal returns (Andres et al., 2007). Following Lehn and Poulsen (1989), Carow and Roden (1997), Andres et al. (2007), Belkhir et al. (2013) and Boubaker et al. (2014), we use the free cash flow-to-total sales ratio (FCF) defined as operating income before depreciation, amortization, taxes, interest expenses and dividends divided by companies' sales in the year before the buyout announcement.

Leverage is another variable that has been used to construe LBO wealth effects (see Boubaker et al., 2014; Croci and Del Giudice, 2014). It is equal to the target's total debt at the end of last fiscal year prior to the LBO, divided by total equity.

[7] The raw premium is computed as follows:

$$premium_{i,n} = \frac{price_{i,final} - price_{i,n}}{price_{i,n}}$$

where $price_{i,final}$ is the final price offered by the acquirer of the target i and $price_{i,n}$ is the target's share price n working days before the LBO announcement date (see Boubaker et al., 2014).

We correct raw premiums for the market movements by using the following formula:

$$premium_{i,n}^{adj} = premium_{i,n} - \frac{Index_{final} - Index_n}{Index_n}$$

where $Index_{final}$ is the last index's value before the LBO announcement and $Index_n$ is the index value n working days before the LBO announcement date (see Boubaker et al., 2014).

Taxes-to-sales equals to the firm's total income taxes at the end of the last fiscal year prior to LBO, divided by total sales. This variable measures the pre-going private effective tax liability of target firms. Since LBOs require substantial amount of debt, the resulting tax deductibility of interest payments could be a notable source of wealth effects for target shareholders (Boubaker et al., 2014).

Distress is a dummy variable that is equal to 1 if the company has a negative ROE in any of the two years prior to the announcement of a public-to-private transaction, and zero otherwise (see Geranio and Zanotti, 2012). This variable helps us to understand whether companies with poor financial performance prior to an LBO announcement cause stronger market reaction vis-à-vis sound firms.

Growth opportunities before going private are proxied by Tobin's Q defined as the ratio of book value of debt plus the market value of equity divided by the book value of total assets. According to the free cash flow hypothesis, Tobin's q proxies for the quality of management, while, according to the financial distress hypothesis, it proxies for the extent of a firm's growth potential (Carow and Roden, 1997).

Undervaluation controls for the pre-going private firm stock performance. It is calculated as the difference between the logarithmic return of a firm's stock price in the pre-event period (-250, -11) and the logarithmic return of the market price index over the same period (Croci and Del Giudice, 2014). Acquirers may see if target shares are underpriced and then rush in taking firms private (Boubaker et al., 2014).

Risk is measured by the systematic risk (beta) from the regression of a firm's abnormal returns in the pre-event period (-250, -11). It is alleged that low risk firms can bear more leverage and take advantage of the post-LBO tax shelter of debt.

Size is the logarithm of the firm's pre-going private total sales. It is closely related to the information asymmetry hypothesis in the sense that small firms are expected to convey less information to market participants since they usually attract less public interest and are less adequately covered by the financial press (Andres et al., 2005).

ROE is the return on equity ratio at the end of last fiscal year prior to a LBO. It measures profitability prior to LBO announcements.

Deal size is the logarithm of the LBO transaction value and *Club* is a dummy which is equal to 1 for club LBOs and 0 for sole-sponsored. All variables are measured in view of target firms.

As shown in Table 1, 94 out of 137 leveraged public-to-private institutional buyouts took place in the UK market, hence raising concerns about the presence of selection bias

which makes multivariate regression suffer from "functional form misspecification" (FFM) and thus producing biased estimates (Shipman et al., 2017). To minimize selection bias, we employ the propensity score matching (PSM) technique. The idea of propensity score matching is to correct the estimation of the treatment effect (i.e. LBO announcements) for selection bias, by constructing matched pairs that are as similar as possible on the basis of observable UK market and firm-level characteristics. Therefore, PSM's advantage is that it forms treatment and control groups that are similar across some variables, relaxing assumptions about the functional form of variable relations, thereby reducing bias from FFM (Shipman et al., 2017). To implement PSM, we first fit a logit model in which the dependent variable is a dummy taking 1 for UK target firms and 0 for non-UK firms. The covariates include corporate governance structures, leverage and ROE in the UK versus Continental Europe. Untabulated results show that the means in these covariates are statistically different[8] between UK and Continental Europe leveraged public-to-private institutional buyouts. We then derived the propensity scores based on the aforementioned market reaction and corporate governance characteristics and used a nearest-neighbor matching approach to construct matched pairs. The final sample includes 36 one-to-one matched pairs. To get robust results we also run pooled cross-sectional regressions for the full sample of LBOs adding a UK dummy for UK LBOs in the set of independent variables.

Another task of the current research is the identification of firm characteristics that explain the likelihood of LBOs. For that purpose, we use a binary logistic model where the dependent variable is a dummy which takes the value of 1 for LBOs and 0 for firms which have not been involved in any LBO transaction (control sample). We employ a set of operating characteristics of buyout targets as independent variables. In specific, mature companies with low growth are typical LBO candidates for several reasons. Low growth may be indicative of unexplored growth opportunities and the recurring and predictable performance of such mature companies makes them more attractive investments for private equity firms, taking into account the low risk that allows for high leverage (Rosenbaum and Pearl, 2009). Growth variables have been employed by the majority of previous studies and were found to be significant factors of going private through LBOs (i.e., Opler and Titman, 1993; Nikoskelainen and Wright, 2007). Regarding the age of the target company, mature companies are expected to have limited capital investment needs. Therefore, we use the

[8] Standardized differences >20 or < -20 were used to derive statistical inferences (Ferri and Maber, 2013).

capital expenditure ratio (CAPEX) defined as the ratio of capital expenditures to total assets to proxy company maturity.

The free cash flow (FCF) variable is also tested for predicting LBO targets in comparison with their peer groups. According to Jensen (1986), high free cash flow is related to agency conflicts between managers and shareholders over the distribution of excess cash. Instead of returning cash to the owners, managers may make suboptimal investments. The use of debt can bring effective monitoring, resulting in agency costs reduction (Loh, 1992). On the other hand, LBO candidates should have the ability to generate strong and predictable cash flow given the highly leveraged capital structure. Cash flow for buyout firms and control firms is measured by EBITDA margin, since it is conceived to be the most suitable cash flow measure indicating the ability of a firm to service its debt.

According to Jensen (1986), agency problems may have increasing effect on the volatility of cash flows generated by the firms' operations. Opler and Titman (1991) examined cash flow volatility as an indicator of LBO likelihood. They stated that firms with volatile cash flows are less attractive options for the private equity market because of the greater probability of default in their debt obligations. Contrarily, Nikoskelainen and Wright (2007) showed that high volatility in cash flows relates to information asymmetry and enhances the probability of LBOs. Following Nikoskelainen and Wright (2007), we measure cash flow volatility as the standard deviation of the EBITDA margin in the last three fiscal years prior to LBO announcement.

Another important characteristic that an ideal LBO candidate should have is operating efficiency enhancement opportunities (Rosenbaum and Pearl, 2009). There has been an ongoing debate on the long-term impact of LBOs on the performance of acquired firms. Sudarsanam et al. (2011) claimed that public-to-private transactions result in a significantly higher default probability. Concerning, however, the pre-buyout operating characteristics of these companies, previous researchers have not identified common traits among LBO candidates. Opler and Titman (1991 and 1993) introduced cost variables such as R&D expenditures and other operating expenses to identify the likelihood of an LBO deal. Nikoskelainen and Wright (2007), nonetheless, did not separately examine cost variables, but introduced certain efficiency measures which are affected by the cost structure of the firms. Following their methodology, the current study assesses the effect of the return on assets (ROA) ratio on the LBO likelihood.

The role of debt levels in LBO transactions have been at the epicenter of another strand of the literature. Kaplan (1989) studied the post-buyout performance of buyouts and outlined that high leverage is an important source of wealth, due to the significant tax benefits. Lehn and Poulsen (1989) documented that tax incentives arising from tax deductible interest expenses on debt positively affect the probability of a firm to go private. However, subsequent studies identified that the majority of LBO firms tend to use more debt than the amount needed to maximize tax advantages. Besides tax considerations, Opler and Titman (1991) argued that leverage can also reduce agency costs by inducing management incentives to align with those of investors. However, additional leverage requires debt capacity which in turn increases the probability for an LBO (Sudarsanam et al., 2011). Opler and Titman (1993) suggested that firms with volatile cash flows may not be suited for high leverage since they are more likely to experience costly defaults. The current study accounts for debt levels employing the debt-to-equity ratio.

Another task of the current study is the investigation of the long-term operating characteristics of target firms (LBOs) vis-à-vis a control sample of firms which did not go private (non-LBOs). Variations in the long-term operating performance between LBO targets and matching firms are tested using the two-tailed test for differences in means and the Wilcoxon Mann-Whitney test for differences in medians. The explanatory power of the selected variables is then identified through a logistic regression analysis. The aim is to measure the likelihood for LBO as a function of operational characteristics.

4 Empirical results

4.1 Market reaction to LBO announcements

Table 2 displays the results from the stock price reaction to the LBO announcements. For robustness reasons, we report excess returns calculated by the market-adjusted model as well as by the market model. The results show that LBO announcements cause statistically significant positive abnormal returns to pre-buyout shareholders. In specific, the average abnormal return (AAR) is approximately 7.7% on the announcement day (day 0) statistically significant at the 1% level for both models. On the days surrounding the release of the buyout news (days -1 and +1) shareholders experience significant stock price appreciations. In specific, on day -1 the AAR is approximately 1.5% and on day + 1 is slightly above 1% as measured by the two models. Furthermore, it can be shown that that the two- and three-day cumulative average abnormal returns (CAARs) are equal to 9.224% (t-statistic=3.96) and 10.281% (t-statistic=3.60), respectively as calculated by the market-adjusted model.

These results suggest that the announcement of an LBO generates large capital gains to target firms' shareholders. Our results are lower than those found by DeAngelo et al. (1984), Grammatikos and Swary (1986), Lehn and Poulsen (1989), Andres et al. (2007), Officer et al. (2010) and Boubaker et al. (2014), where three-day abnormal returns range from 14.04% to 22.27%.

In the period following the announcement the CAAR (+1, +10) is equal to 2.272% as derived by the market-adjusted model, statistically non-significant at any conventional level. This suggests that the market reacts efficiently and immediately to the LBO announcements. On the other hand, the pre-event period (-10, -1) shows a CAAR of 4.531% as computed by the market-adjusted model. These abnormal returns are not statistically significant. Similar pre-buyout announcement excess returns were also found by Andres et al. (2007). Overall, the above results corroborate prior evidence from the US and European LBO market that public-to-private LBO transactions still create value to pre-buyout shareholders.

[Insert Table 2]

Another task of our study is the investigation of possible heterogeneous market response to the announcement of club and sole-sponsored LBOs. The empirical evidence on the effect of club deals on shareholder wealth gains is mixed. Club deals enable private equity firms to overcome capital constraints, serve diversification needs and accommodate for their desired levels of debt and target prices. For these reasons, club deals exhibit higher premiums compared to sole-sponsored deals (Cao et al., 2015). On the other hand, Officer et al. (2010) analyzed the pricing and characteristics of club LBOs and found that target shareholders earn approximately 10% less of pre-bid firm equity value, or roughly 40% lower premiums in club LBOs vis-à-vis sole-sponsored LBOs.[9] The price issue raises concern over club LBOs in the sense that a private equity consortium may be colluding to depress stock prices by limiting the number of competing bidders (Officer et al., 2010). The consequence of this bidder collusion is the reduction of the tender offer stock price especially in the cases of a dispersed shareholder base in the target firms (Cao et al., 2010).

Panel A of Table 3 demonstrates the abnormal market reaction to club LBOs. On day 0, the AAR is equal to 8.170%, statistically significant at the 1% level. The CAAR of two- and three-days amounts to 10.006% and 10.960%, respectively based on the market-adjusted

[9] Their results were robust to controls for target and characteristics such as size, risk, and time and industry fixed effects.

model. These findings appear to be slightly higher than those reported by the full sample. The pre- and post- event CAARs are equal to 5.843% and 3.625%, respectively, however statistically insignificant at any conventional level. Panel B of Table 3 displays the market reaction to sole-sponsored LBOs. The excess returns on day 0 amount to 7.676% based on the market-adjusted model and 7.617% based on the market model, statistically significant at the 1% level. The CAAR of two- and three-days is equal to 9.232% (9.039%) and 10.564% (10.327%), respectively based on the market-adjusted model (market model). Pre- and post-event window stock price reaction, lags significantly to that of the full sample and club subsample of LBOs. Employing equality testing (Panel C), the mean differences on three days separately (days -1, 0 and +1) and combined, are not statistically significant.

The fact that the market reaction to club LBOs is not notably different from that of their sole-sponsored counterparts allows us to conclude that the theory behind bidder collusion suppressing stock prices and buyout premiums (Officer et al., 2010) does not find fertile ground in Europe. One possible explanation is that, contrary to the US, the European publicly traded firms have less dispersed shareholder structure. Therefore, temporary stock price pressure, resulting from bidder collusion, is less likely to occur. Moreover, premia paid out to shareholders at the event of an LBO in Europe have been proven to be comparable to the US (Betzer, 2006). Therefore, private equity funds appear to be inclined to offer more to investors, especially in the UK where investor protection is stronger (Cao et al., 2010).[10] This, in turn, further highlights the limited price manipulation role, inflicted by club deals in the European context. Boone and Mulherin (2011) reinforce our claim, since they posit that joint bidding by private equity funds does not facilitate collusion. On the contrary, it is consistent with the competition hypothesis of joint bidding for competitive reasons such as scale, risk and expertise.

[Insert Table 3]

The structure of our sample allows us to highlight differences in wealth effects for subsamples of acquiring firms, depending on their level of conformity with different corporate governance characteristics. The variables included are the strength of auditing and reporting standards, the protection of minority shareholders' interest, the efficacy of

[10] Cao et al. (2010) also report a higher premium for non-club relative to club LBOs deals using a sample consisting of 844 global LBOs irrespective of deal size.

corporate boards and the strength of investor protection[11]. Table 4 reports the wealth effects surrounding the LBO announcement date for the subsamples of target firms with differences in the levels of auditing and reporting standards and to the degree of minority shareholder protection.[12] Abnormal returns are distinctively higher on the announcement date of the LBO for the subsample of firms with higher levels of auditing and reporting standards and stronger mechanisms ensuring minority shareholder rights. More specifically, on the announcement date, the AAR is 8.053% (8.058%) for subsample A, relative to 5.788% (5.573%) earned for subsample B. These results are significant at the 1% level. The two- and three-day CAARs around the announcement date also elicit notable differences between the deals taking place under a stronger corporate governance environment relative to the weaker corporate governance subsample. Differences in CAARs between the firms belonging to subsample A and those belonging to subsample B are positive and statistically significant for the two- and three-day CAARs. When comparing these results with the findings of Table 2, we observe that two- and three-day CAARs are higher for the subsample of stronger corporate governance characteristics relative to the full sample results. The same applies for subsample A average abnormal returns on days -1, 0 and +1.

[Insert Table 4]

Table 5 provides results for the efficacy of corporate boards variable which measures to what extent management is accountable to the investors and the Board of Directors (BoD). Subsample C includes the firms where corporate board efficacy was high, whereas subsample D includes those where the management appears to exert smaller levels of

[11] According to the World Economic Forum Global Competitiveness Report, the first three variables, using a 1 to 7 scale, measure the answers of interviewees to the following questions:
a. In your country how strong are auditing and reporting standards?
b. In your country how would you characterize corporate governance by investors and boards of directors by use of measuring how accountable is the management towards investors and the BoD (efficacy of corporate boards)?
c. In your country to what extent are the interests of minority shareholders protected by the legal system?
The last variable is the strength of investor protection index on a 1 to 10 scale.

[12] The subsample of firms that report a value with respect to the strength of auditing and reporting standards greater or equal to the mean value is characterized as subsample A, while those that take values below the mean belong to subsample B. Similar process is followed for the rest of corporate governance measures. Firms belonging to subsample A report a value higher or equal to mean value, while those allotted to subsample B are rated below the mean value. Firms' allocation to subsamples A and B, given the aforementioned two corporate governance criteria, is exactly identical. The use of median values did not change notably the formation of the aforementioned subsamples.

accountability towards the BoD and the investors[13]. Higher levels of accountability of the management towards investors and the BoD, correspond to higher abnormal returns caused by the release of the news of an LBO. More specifically, on the date of the announcement, AAR for subsample C is 7.992% (8%) compared to 5.219% (4.876%) for subsample D. Subsample C exhibits abnormal returns higher than the overall sample results. The two-day CAAR is 9.642% (9.503%), while the three-day CAARs is 10.765% (10.567%) both statistically significant at the 1% level. The corresponding two and three-day CAARs are 5.852% (5.555%) and 6.379% (6.138%), respectively for the subsample D. Panel C shows that the mean differences in two and three-day CAARs between subsamples C and D are statistically significant at the 1% level. Overall, these results demonstrate that the market welcomes more positively LBO announcements for target firms enjoying higher board efficacy.

[Insert Table 5]

Table 6 reports the market reaction to LBO announcements in hosting countries, based on the investor protection levels[14]. AARs on the announcement date (day 0) are positive and statistically significant for both subsamples. However, subsample E exerts a 7.794% (7.710%) return compared to 7.195% (7.254%) for subsample F. Moreover, the three-day CAAR is higher for subsample E relative to subsample F, statistically significant at the 5% level.

[Insert Table 6]

Following these corporate governance results and the wealth effects, caused by succumbing to the euphoria of an LBO news release, some important remarks are in order. Firstly, corporate governance variables suggest that higher levels of investor protection are viewed positively by investors' reactions to LBO announcements. High investor protection comes in the form of strong auditing and accounting standards, high accountability of the management towards investors and the board, as well as protection of minority shareholders

[13] Subsample C includes the firms reporting overall efficacy of corporate boards greater or equal to the mean value. Likewise, subsample D includes those firms which lie below the mean value.

[14] Subsample E includes firms belonging to countries where investor protection is rated above or equal to the mean value, whereas subsample F includes the sample firms belonging to countries where investor protection is less than the mean value.

interests. In essence, the strength of investor and minority shareholder protection on a country level, as illustrated from the World Economic Forum Global Competitiveness Report, decisively influences the magnitude of wealth effects. This result is in line with the incentive realignment hypothesis which claims the need to realign the interests of directors and shareholders as a driving force behind the need to go private (Kaplan, 1989). However, higher shareholder concentration in Continental Europe implies closer monitoring from outside shareholders prior to the buyout transaction (Renneboog et al., 2007). Therefore, in Continental Europe the need for incentive realignment is understandably expected to be smaller compared to the UK, where institutional holdings are prevalent and concentrated ownership is scarce (Faccio and Lang, 2002, Belkhir et al., 2013). These divergences found in the European corporate governance framework are also found in our results, leading us to deduce that in our case the control hypothesis finds fertile ground. According to the latter, firms highly monitored by their shareholders are less attractive to private equity investors since value creation opportunities are smaller and large shareholders might extract private benefits of control (Achleitner et al., 2013). A less controlled firm with a dispersed shareholder base might view the LBO as a viable alternative. As a result, the relationship between ownership concentration and conversely smaller monitoring and wealth gains should be inverse[15].

Secondly, our findings corroborate Andres et al. (2007) who conjecture that pre-LBO quality of corporate governance mechanisms significantly affect the magnitude of wealth effects emanating from the buyout announcement. However, Andres et al. (2007) claimed that, on a macro level, poor shareholder protection is associated with greater wealth gains for pre-LBO shareholders. LaPorta et al. (1998) asserted that high degrees of legal shareholder protection influences positively stock price valuations causing prices to diverge less from the fair values. Consequently, in the event of an acquisition, a target residing pre-acquisition in a well-protected financial environment would have a smaller upside potential. In contrast, we claim that the strength of investor and minority shareholder protection in a market is positively associated with LBO announcement short-term stock price gains. Our affirmation is in line with Cao et al. (2010) who concluded that greater investor protection in all types of takeovers, including LBOs, positively affects the wealth gains emanating from the deal announcement. Betzer (2006) further affirmed that, contrary to the LaPorta et al

[15] Martynova and Renneboog (2008) documented a negative spillover effect from low investor protection acquirers to targets, when examining cross-border M&As, further highlighting the deeper foundations of this inverse relationship.

(1998, 2002) rationale, strong corporate governance mechanisms are beneficial for target firms' shareholders at the event of an LBO.

Thirdly, as already mentioned, LBOs are distinct cases in the M&A literature since they usually involve financially distressed firms (Tirole, 2006) as targets. We argue that under such circumstances, even in medium to large capitalization target firms, like the ones included in our sample, shareholders value more highly the event of an LBO under the protection of a more secure investor and/or shareholder protection environment. Given the aggressive use of leverage (Cao et al., 2015), concerns over LBOs themselves, by investors and regulators around the world, are widespread. This enhances our view that fears of low efficacy of boards, poor accounting reporting and representation as well as low respect towards minority shareholder rights, impact negatively the magnitude of returns arising from public-to-private transactions. These corporate governance conditions are especially collectively found in low investor protection markets.

We believe that the corporate governance subsample partition allows us to explore further implications for the vibrant European buyout industry. Implications are fourfold and refer to: a) the 2008 financial crisis, b) bid premiums, c) shareholder activism and d) relisting opportunities. First, any attempt to explain short-term gains with respect to corporate governance factors should take into account a shift in investor expectations due to the 2008 financial crisis and the barrage of corporate scandals during the 2000s that led to the tightening of the legislatory framework. This has resulted in LBOs, eventuating under the auspices of higher investor protection, to be more attractive to investors due to the transparency in the underlying market. Rossi and Volpin (2004) had previously confirmed that M&A activity is greater in countries with stronger investor protection and better accounting standards. Appadu et al. (2016) re-affirmed that in developed economies the strength of the regulatory environment is an important determinant of the M&A activity. Weir et al. (2005) also conjectured that public-to-private transactions in high investor protection environments, like the UK, are mainly driven by firms with duality as well as high CEO and institutional ownership. These findings further underlined the role of strong corporate governance in determining buyout candidates.

Second, it is interesting to note that in the UK, representing the largest percentage of our examined high investor protection subsample, undervaluation has been identified as the driving force behind shareholder gains from public-to-private transactions (Renneboog et al., 2005). What is more, the likelihood of a UK firm becoming a target in an LBO transaction is significantly higher (Stromberg, 2007). LaPorta et al. (2002) implicitly

assumed that in countries like the UK, where common law prevails, premia should be lower because shares trade at a premium (or are fairly evaluated) due to stronger investor protection. Likewise, in Continental Europe, where civil law is the norm, investor protection is weak and valuations are sluggish. Therefore, premia should be higher. Betzer's (2006) empirical findings, however, underlined that premia offered by private equity firms to investors in the UK are larger than the ones offered to Continental Europe target firms' shareholders. Smaller premia paid out in Continental Europe over the UK and the US (Betzer, 2006) might also be construed by the relatively underdeveloped corporate bond markets of Continental Europe where deals are still largely bank loan financed. Likewise, the finding of low bid premium offered to LBO target shareholders in deals originating in countries with low investor protection is a recurring theme in Cao et al. (2010). A higher bid premium offered in high investor protection environments is associated with diffuse ownership that exacerbates the free-rider problem in takeovers, forcing bidders to pay more (Rossi and Volpin, 2004). These characteristics of the segmented European market render it a distinct case, where forces, different than the LaPorta et al. (1998, 2002) theoretical framework, appear to exert their influential power in determining stock prices after an LBO event.

Third, we conjecture that shareholder activism may also be viewed as influencing short-term shareholder behavior. Recent studies on corporate shareholding structure (Davies 2015; Filatotchev and Dotsenko, 2015) report the rapidly expanding role of shareholder activism, primarily exercised by private equity funds holding minority shareholder stakes in public companies in the UK. Kim et al. (2015) claim that active investors are more prevalent in countries with good investor protection. In our view, private equity funds, already owning a minority stake in the LBO target, would normally pressure the public firm's management to acquire a better bid premium from the LBO potential acquirer. This would occur in light of the delisting process looming ahead (i.e. the private equity funds seeking for an exit at the best possible premium). Thus, a better tender offer may follow the initial offer towards the target shareholders and a greater exit benefit may arise for pre-LBO announcement shareholders. Therefore, the aforementioned mechanism could be viewed as a further reason why within stronger corporate governance environments a short-term stock price reaction may be larger.

Fourth, the delisting process is not an all that catastrophic event especially given a liquid private equity market in Europe. Buyout-backed exits of private equity funds increased to

$173 billion in 2014 (Bain & Company, 2015).[16] Part of those private equity exit strategies include a significant number of LBOs turning public several years after the initial deal, under a reverse LBO procedure. In fact, reverse LBOs are in many cases found to outperform IPOs and the stock market as a whole (Cao and Lerner, 2009). Scellato and Ughetto (2013) stated that private equity funds in European buyouts have a long-term viewpoint for their investment and do not have a high propensity for asset divestments. Therefore, within a higher investor protection environment, a long-term investor, institutional or not, might view the possibility of a buyout positively. This is the case, especially given an OTC market that would accommodate a potential sale of shares during the private period.[17] Moreover, a going-private transaction does not usually alienate the firm from the control of the tight regulatory setting of Securities and Exchange Committees (Bartlett, 2009). Quite the opposite, the reliance of the going-private decision on high-yield debt securities will usually mean strenuous SEC-reporting obligations that assimilate the provisions of SOX related legislation for European firms. A strong corporate governance environment ensures, therefore, close monitoring of the private equity decisions, which is desirable to minority shareholders, during the usually long private period.

4.2 Cross-sectional regressions

This section presents regression results that unveil the drivers of the LBO wealth effects. We use standard ordinary least squares with t-statistics based on White's (1980) heteroscedasticity-consistent standard errors to estimate all regressions. Table 7 contains four specifications where the dependent variable is the average abnormal return of day 0 based on the market model and the market-adjusted model, respectively. The first two regressions (non-PSM) are based on the whole sample of LBOs and contain 11 independent variables as described in section 3.2 and one dummy variable for UK LBOs versus non-UK LBOs. The inclusion of the UK dummy variable will help us to test whether the wealth effects from the LBO announcements are UK-driven.[18] To get more robust regression results, we also employ the propensity score matching (PSM) technique based on corporate governance characteristics and we use a nearest-neighbor matching approach to construct

[16] Secondary buyouts as an exit channel for private equity funds in Europe are examined in Achleitner et al. (2012).

[17] According to Martinez and Serve (2011), there is an active OTC market for firms that delist following LBOs (i.e. firms that "go dark").

[18] Corporate governance variables are not included in the regression analysis since these are closely related with the UK dummy.

matched pairs. Untabulated pairwise correlations between the regressors used in our study show that our regressions are free of a multicollinearity problem.

The results from Table 7 show that the free cash flow ratio has a positive and statistically significant coefficient on abnormal returns no matter the technique used. This result lends support to the free cash flow hypothesis of Jensen (1986), according to which LBOs are alleged to mitigate agency costs between managers and shareholders. Moreover, the positive coefficient of FCF confirms our hypothesis, i.e. that firms with abundant cash flow offer the incentive for buyers to take these companies private. The coefficient of Distress variable is positive and statistically significant in the first two models indicating that target firms experiencing poor operating performance reap higher abnormal returns on the announcement date. However, the statistical significance of the distress variable is not corroborated when employing the PSM technique. Moreover, the size of the transaction value (deal size) has a positive coefficient in all regressions implying that the higher the deal value, the stronger the market reaction to LBO announcements.

On the other hand, the coefficient of size has the expected negative sign suggesting that the size effect partly explains the wealth gains from LBO announcements. Growth opportunities also display the expected negative coefficient which is statistically significant in the first set of regressions. This finding is in line with Opler and Titman (1993), Carow and Roden (1997) and Cao et al. (2016), who also found that firms with low growth opportunities (low Tobin's Q) enjoy higher wealth gains on LBO announcements. Undervaluation is another variable that has a negative and statistically significant coefficient in the first two regressions. These results are in line with prior evidence suggesting insiders may behave opportunistically to buy out their firms' stocks at lower prices (Boubaker et al., 2014). The dummy of club LBOs, which takes the value of 1 for club LBOs and 0 for sole-sponsored, does not display any statistical significance, which confirms evidence that the two groups of LBOs do not produce statistically different market reaction on and around LBO announcements. Leverage is positive and statistically significant at the 10% level when using the PSM technique. This result is at odds with prior evidence (see Croci and Del Giudice, 2014). However, high debt levels generate further tax shields for acquirers subsequent to LBOs which may partly explain the positive market reaction to these deals. Interestingly, the UK dummy does not bear any statistical significance implying that the UK market per se cannot be considered as a significant driver of the wealth effects of LBOs. The other independent variables fall short of being statistically significant, even though they present the expected sign.

[Insert Table 7 here]

Following Boubaker et al. (2014), we perform another set of regressions where the dependent variable is the raw and the market-adjusted premium offered one day prior to LBO announcement.[19] The first two regressions are conducted using the whole dataset (non-PSM), while the second set of regressions are performed using the PSM.

Therefore, we present four different specifications in Table 8. The results show that FCF exerts a positive effect on the premium offered to pre-buyout shareholders. Moreover, distress and deal size also have a positive coefficient when using the whole sample firms (non-PSM). In contrast, size, undervaluation and growth opportunities are negatively correlated with premiums paid. These results corroborate those found in Table 7, thus making us draw the following conclusions. First, high cash flow availability of targets is associated with larger expected wealth gains and premiums offered from going private transactions. Second, both the market reaction and premiums are positively associated with the LBO deal value. Third, the expected wealth gains and premiums are adversely related with target size, growth opportunities and prior to buyout stock price performance (undervaluation). These results hold when we control for a gamut of other factors known to affect wealth gains from going private transactions. Similarly to Boubaker et al. (2014), all models fit the data appropriately compared with prior relevant studies. The adjusted R-squared ranges from 9.8% to 13.3% and all F-values are significant at any conventional levels.

[Insert Table 8 here]

4.3 Firm characteristics explaining the likelihood of LBOs

Another objective of our study is to investigate the operating characteristics of LBO firms vis-à-vis a control sample of firms that did not go private (non-LBO firms). This will help us identify those fundamentals that affect the likelihood of going private. The analysis alludes to one to three years prior to LBOs.

Table 9 reports and compares the mean and median values of six variables including revenues growth (REVGR), EBITDA margin (EBITDAM), standard deviation of EBITDA

[19] Our regression results are qualitatively similar when using raw and market-adjusted premium offered one week and month prior to LBO announcement as dependent variables.

margin three years prior to the buyout announcement (EBITDAVOL), capital expenditure (CAPEX), return on assets (ROA) and debt-to-equity ratio (Leverage). The results indicate that there are significant differences in both means and medians in the maturity metric (CAPEX), whereas the cash flow volatility (EBITDAVOL) and revenues growth (REVGR) have statistically significant medians between LBO and non-LBO firms. These results are in line with our speculations that LBO targets are usually mature businesses with low capital expenditure requirements[20]. In addition, LBO firms have less volatile cash flows, thus providing more security from a debt provider's perspective. On the other hand, firms that are more likely to go private through LBOs are assumed to have lower growth rates compared to their matching group of firms. Less powerful in terms of statistical significance is the difference in leverage medians, thus not strongly supporting the hypothesis that LBO targets should have low leverage rates so as to bear the additional debt burdens required for such transactions. This finding further affirms Sudarsanam et al. (2011) finding that existing debt levels are not a deterrent for LBOs today.

[Insert Table 9 here]

To determine firm characteristics that explain the likelihood of LBOs, we use a logistic regression with a binary dependent variable that takes the value of 1 for firms that went private through LBOs and 0 for non-LBO firms. Table 10 presents the results from the logistic regression analysis. The results show that EBITDA margin, EBITDA volatility and CAPEX ratio have the predicted signs and are statistically significant. More specifically, the EBITDAM coefficient is positive, implying that a firm is more likely to go through a public-to-private transaction the greater its free cash flow is prior to the buyout announcement. This is in line with the free cash flow theory of Jensen (1986), according to which companies with high cash flow suffer from agency costs stemming from the conflicting interests between managers and shareholders over the distribution of excess cash. Managers with large free cash flows at their discretion have incentives to waste organizational resources on negative NPV projects, rather than pay out the excess cash to shareholders through dividends or share repurchase schemes (Le Nadant and Perdreau, 2006). Lehn and Poulsen

[20] On the contrary, the Sudarsanam et al. (2011) sample includes firms smaller in size and suffering from lower growth relative to their non-LBO peers.

(1989) and Belkhir et al. (2013) also found a positive relationship between the undistributed cash flow and the going-private activity.

Low capital expenditure requirements are regarded to enhance a company's cash flow generation (Rosenbaum and Pearl, 2009). Consequently, this characteristic is closely related to the free cash flow theory as well. High amounts of undistributed cash flow over which agency conflicts emerge, are mainly observed in mature businesses with low capital investment needs. Therefore, capital expenditure can be used as an indicator of the operating age of the company. Consistent with this theoretical framework, we find that mature companies are more likely to go private through LBOs.

Opler and Titman (1991) examined cash flow volatility as an indicator of LBO likelihood. They stated that firms with volatile cash flows are less attractive options for the private equity market due to their greater probability of default on their debt obligations. In line with their conclusions, we find a statistically negative coefficient on EBITDAVOL.

Panel B of Table 10 contains the marginal effects which show how incremental changes in independent variables may affect the likelihood of an LBO. According to the marginal effects results, an increase in the EBITDA margin by one unit will increase the likelihood of an LBO by 0.581%. Similarly, an increase by one unit in the standard deviation of EBITDA in the last three years will reduce the probability of an LBO by 3.11%. This result suggests that the volatility of cash flows generated by the LBO target is an extremely important factor in determining the LBO likelihood. Similarly, an increase by one unit in the capital expenditure ratio, which is supposed to be lower for more mature businesses, leads to a 1.071% decrease in the probability of the firm to go private through LBOs.

[Insert Table 10 here]

5. Conclusions

This study investigates medium-to large-sized leveraged public-to-private institutional buyouts in Europe. Despite their growth, especially in the 2000s, researchers have scarcely investigated the driving forces behind short-term wealth creation in Europe, since most of the research on LBOs has been concentrated in the US market. This study fills the gap of limited evidence on the European LBO activity by examining both the boom of the late 1990s and the period before and after the global financial crisis of 2008. Our main purpose is to quantify the shareholder wealth gains surrounding the announcement of the deal and identify the sources of these gains. To delve deeper into the wealth effects stemming from

leveraged public-to-private institutional buyouts, we examine two types of LBOs, club vs. sole-sponsored, in separate subsamples. Most importantly though, we analyze the impact of different facets of corporate governance mechanisms, on a macro level, attempting to highlight whether the level of protection offered to investors takes its toll on potential abnormal returns. Moreover, we analyze the operating characteristics of LBO firms with those of a control sample of non-LBOs in order to determine which firm factors affect the likelihood for a public company to go private through an LBO. The research on the relationship between firm characteristics and the likelihood of an LBO is limited and, therefore, we trust that our results complement the existing literature.

During the period under examination the private equity market flourished, thus reigniting the new wave of LBO transactions. Moreover, the LBO deals were fuelled by the circulation of the European common currency, the collapse of capital constraints, the harmonization of national corporate and tax laws across the European Union and the decrease in the cost of debt. Collectively, all these are alleged to mitigate the wealth effects of LBOs since the risk of undertaking such transactions seems smaller in a market that protects investors and favors the use of cheap cost of debt.

The empirical results show that pre-buyout shareholders earn an abnormal return exceeding 7.6% on the announcement day and a cumulative average abnormal return of about 10% over a three-day event window. Surprisingly, the group of club deals does not bring about differential market reaction to LBO announcements compared with that of sole-sponsored. This finding is at odds with recent evidence from the US market where bidder collusion seems to depress sale prices by limiting the number of competing bids. However, the European market is much less dispersed in terms of ownership, thus providing less fertile ground for bidder collusion cases. A less dispersed shareholder base in the European context, relative to the US market, may also exacerbate the conditions under which a takeover “battle” takes place in a club LBO. Mounting pressure from existing shareholders might set off a bid premium upsurge.

Our paper contributes further to the pertinent literature by explaining the impact of country corporate governance characteristics on the short-term stock price behavior around LBO deal announcements. Wealth gains are greater in countries that have comparatively stronger corporate governance standards, irrespective of the various corporate governance measures used in our analysis. It appears that a number of reasons exist that render the European context a unique case for LBOs, where previously documented evidence in the US market does not normally hold. In this respect, strong corporate governance appears to

stimulate short-term wealth gains for LBO targets. This presumably may be the case since LBOs taking place in less secure investor protection environments could potentially be prone to risk stemming from poor accounting and reporting standards and low board of directors efficacy. Moreover, based on the control hypothesis, higher ownership and stiff corporate control, found usually in low investor protection environments, cause the relationship between wealth gains and such control characteristics to be inverse (Achleitner et al., 2013). Higher bid premiums, active and liquid private equity and OTC markets as well as shareholder activism are among the factors that might also explain our findings. Our results defy the LaPorta et al. (1998 and 2002) rationale implicitly claiming that the quality of corporate governance mechanisms should be inversely associated with the magnitude of abnormal returns.

We also use pooled cross-sectional regression analysis in order to detect the factors that construe stock price abnormality during the period surrounding LBO announcements. To ensure that our results are not UK driven and exclude any selection bias, we take advantage of the propensity score matching technique and form one-to-one pairs based on corporate governance characteristics. In line with previous research, results show that undervalued firms, with low risk and small size, experience high abnormal returns during LBO deal announcements. We also contend that high amount of undistributed cash flow is associated with wealth gains, thus supporting the free cash flow hypothesis. The latter posits that the mitigation of agency costs generates significant abnormal returns.

A final intuitive objective of the current study is the examination of the factors that increase the likelihood for a firm to go private. For that purpose, we form a control sample of firms that did not go private and compare operating characteristics with the sample of firms that went private through an LBO. The logistic regressions analysis displays that the likelihood for a company to go private through an LBO in lieu of remaining public is directly linked with the maturity of the company and the amount and stability of cash flow generated by its operations. Empirical results once again lend support to Jensen's free cash flow theory, according to which the agency conflicts between managers and shareholders over the distribution of free cash flow are the main drivers for LBO activity. Consequently, mature businesses with cash flow stability and low capital expenditures may be prone to becoming LBO targets. Growth rates, pre-buyout leverage and operating profitability were not found to be associated with the companies' decision to go private through an LBO.

Our empirical findings have important implications for the impact of macro governance characteristics on the wealth effects of LBOs, since we document that stronger governance

structures exert a positive influence on the short-term capital gains for target firms' shareholders. This finding is related to the control hypothesis based on which the smaller the ownership concentration and control, the greater the potential gains from an LBO transaction. Collectively, these findings underline that in a segmented European market LBO events do not necessarily follow previously observed and well-documented patterns in the US market.[21]

This study provides also new insights into the private equity industry which could be useful for market participants involved in LBO transactions. From the perspective of investors who invest in LBO firms, our results reveal the magnitude and sources of abnormal returns emanating from LBO announcements. From the perspective of private equity professionals, this study illustrates the major characteristics which favor LBO deals.

A limitation of this study is the investigation of only macro corporate governance characteristics in explaining wealth effects surrounding leveraged public-to-private institutional buyouts. However, the inclusion of variables related to corporate governance mechanisms on a micro level (e.g., ownership structure, management's equity stockholdings, management compensation, board composition) would have accommodated a more integrated approach to the European context. We believe that future research could fill this void.

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[21] These patterns include low bid premiums in countries where common law prevails and higher stock price valuations when investor protection is high, as outlined in LaPorta et al. (1998 and 2002).

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Table 1: Distribution of LBOs per year and country.

Panel A: Distribution of LBOs per year

LBO Year	Number of LBOs	Average Transaction Value (mil $)	Median Transaction Value (mil $)	Sum of Transaction Values (mil $)
1998	5	431.09	192.54	2,155.46
1999	24	356.57	198.03	8,557.57
2000	14	471.67	367.75	6,603.34
2001	15	510.52	335.38	7,657.74
2002	7	896.86	649.28	6,278.04
2003	7	870.11	585.33	6,090.80
2004	6	1,007.10	649.48	6,042.61
2005	8	1,791.31	971.76	14,330.50
2006	20	2,415.04	656.38	48,300.72
2007	13	3,014.13	1,097.35	39,183.63
2008	3	1,486.94	589.64	4,460.81
2009	1	290.16	290.16	290.16
2010	2	2,880.08	2,880.08	5,760.16
2011	3	423.38	221.09	1,270.13
2012	2	1,474.30	1,474.30	2,948.61
2013	0	-	-	-
2014	3	709.56	597.66	2,128.69
2015	1	756.31	756.31	756.31
2016	3	589.52	248.61	1,768.56
1998 – 2016	137	1,201.34	407.84	164,583.84

Panel B: Distribution of LBOs per country

LBO Country	Number of LBOs	Average Transaction Value (mil $)	Median Transaction Value (mil $)	Sum of Transaction Values (mil $)
Austria	1	100.07	100.07	100.07
Denmark	3	1,519.11	585.33	4,557.33
Finland	2	531.12	531.12	1,062.24
France	2	554.67	554.67	1,109.34
Germany	2	320.98	320.98	641.97
Iceland	1	4,629.42	4,629.42	4,629.42
Ireland	8	1,032.81	392.07	8,262.44
Italy	3	558.25	589.64	1,674.75
Luxembourg	1	211.86	211.86	211.86
Netherlands	4	447.80	271.84	1,791.21
Norway	4	573.44	626.81	2,293.78
Spain	2	3,536.55	3,536.55	7,073.10
Sweden	9	1,159.24	335.38	10,433.16
Switzerland	1	1,334.30	1,334.30	1,334.30
UK	94	1,270.31	402.23	119,408.87
Total	137	1,201.34	407.84	164,583.84

Table 2: Daily average abnormal returns and cumulative average abnormal returns around LBO announcement days using the market-adjusted model.

Panel A: Abnormal returns for the full LBO sample (N = 138)

	Market-adjusted model		Market model	
Event Window	%	t-statistic	%	t-statistic
Day -1	1.537***	4.06	1.412***	4.62
Day 0	7.687***	9.62	7.657***	25.06
Day 1	1.057***	2.85	1.013***	3.32
CAAR (-10, -1)	4.531	0.87	4.408	1.58
CAAR (+1, +10)	2.272	0.44	1.546	1.60
CAAR (-1, 0)	9.224***	3.96	9.069***	20.99
CAAR (-1, +1)	10.281***	3.60	10.082***	19.05

Notes: The table reports the average abnormal return and cumulative average abnormal returns calculated by the market model and the market-adjusted model aggregated across the cross-section of LBOs for each day within the event window. T-statistics are also reported. * denotes statistical significance at the 10% level. ** denotes statistical significance at the 5% level. *** denotes statistical significance at the 1% level.

Table 3: Daily average abnormal returns and cumulative average abnormal returns around LBO announcement for club and sole sponsored LBOs.

Panel A: Abnormal returns for the club LBO sample (N = 53)

	Market-adjusted model		Market model	
Event Window	%	t-statistic	%	t-statistic
Day -1	1.836**	2.42	1.746***	3.79
Day 0	8.170***	6.38	8.162***	17.71
Day 1	0.954**	2.17	0.955**	2.16
CAAR (-10, -1)	5.843	1.06	5.260	1.61
CAAR (+1, +10)	3.625	0.66	2.930	0.91
CAAR (-1, 0)	10.006***	4.05	9.908***	15.20
CAAR (-1, +1)	10.960***	3.62	10.903***	13.66

Panel B: Abnormal returns for the sole-sponsored LBO sample (N = 84)

	Market-adjusted model		Market model	
Event Window	%	t-statistic	%	t-statistic
Day -1	1.556***	3.45	1.423***	3.80
Day 0	7.676***	7.69	7.617***	20.13
Day 1	1.332**	2.54	1.287***	3.40
CAAR (-10, -1)	4.919	0.84	5.108	1.29
CAAR (+1, +10)	2.499	0.43	1.884	1.57
CAAR (-1, 0)	9.232***	3.54	9.039***	16.89
CAAR (-1, +1)	10.564***	3.31	10.327***	15.76

Panel C: Differences between club and sole-sponsored LBOs subsamples

	Market-adjusted model		Market model	
	Differences	t-statistic	Differences	t-statistic
Day -1	0.282	0.35	0.323	0.39
Day 0	0.493	0.30	0.545	0.33
Day +1	-0.378	-0.53	-0.292	-0.44
	Differences	z-statistic	Differences	z-statistic
CAAR (-10, -1)	0.923**	2.45	0.152	0.41
CAAR (+1, +10)	1.126***	8.75	1.046***	9.26
CAAR (-1, 0)	0.773	0.77	0.868	0.86
CAAR (-1, +1)	0.396	0.54	0.576	0.79

Notes: The table reports the average abnormal return and cumulative average abnormal returns calculated by the market model and the market-adjusted model aggregated across the cross-section of LBOs for each day within the event window. T-statistics are also reported. * denotes statistical significance at the 10% level. ** denotes statistical significance at the 5% level. *** denotes statistical significance at the 1% level.

Table 4: Average abnormal returns and cumulative average abnormal returns on LBO announcement days using as corporate governance measures the strength of auditing and reporting standards and the extent of protection of minority shareholder interests.

Panel A: Abnormal returns for high auditing standards and high protection of minority shareholders LBO subsample (N = 115)

	Market-adjusted model		Market model	
Event Window	%	t-statistic	%	t-statistic
Day -1	1.738***	3.93	1.610***	4.65
Day 0	8.053***	9.31	8.058***	23.28
Day 1	1.256***	2.96	1.200***	3.47
CAAR (-10, -1)	4.838	0.88	4.640	1.27
CAAR (+1, +10)	2.254	0.41	1.725	0.58
CAAR (-1, 0)	9.791***	3.98	9.668***	19.75
CAAR (-1, +1)	11.047***	3.67	10.869***	18.13

Panel B: Abnormal returns for low auditing standards and low protection of minority shareholders LBO subsample (N = 22)

	Market-adjusted model		Market model	
Event Window	%	t-statistic	%	t-statistic
Day -1	0.505	1.31	0.392	0.74
Day 0	5.788***	2.80	5.573***	10.60
Day 1	0.031	0.05	-0.032	-0.06
CAAR (-10, -1)	2.473	0.59	2.853	1.32
CAAR (+1, +10)	2.854	0.69	2.634	0.68
CAAR (-1, 0)	6.293***	3.38	5.964***	8.02
CAAR (-1, +1)	6.324***	2.77	5.933***	6.52

Panel C: Differences between high - low auditing standards and high - low protection of minority shareholders LBOs subsamples

	Market-adjusted model		Market model	
	Differences	t-statistic	Differences	t-statistic
Day -1	1.233**	2.10	1.219*	1.90
Day 0	2.265	1.01	2.485	1.11
Day +1	1.225	1.65	1.232	2.01
	Differences	z-statistic	Differences	z-statistic
CAAR (-10, -1)	2.364***	7.77	1.787***	6.00
CAAR (+1, +10)	-0.600***	-3.51	-0.909***	-6.15
CAAR (-1, 0)	3.498***	2.83	3.704***	3.00
CAAR (-1, +1)	4.723***	5.37	4.936***	5.63

Notes: The table reports the average abnormal return and cumulative average abnormal returns calculated by the market model and the market-adjusted model aggregated across the cross-section of LBOs for each day within the event window. T-statistics are also reported. * denotes statistical significance at the 10% level. ** denotes statistical significance at the 5% level. *** denotes statistical significance at the 1% level.

Table 5: Average abnormal returns and cumulative average abnormal returns on LBO announcement days using as corporate governance measure the degree of efficacy of corporate boards.

Panel A: Abnormal returns for high efficacy of corporate boards LBO subsample (N = 122)				
	Market-adjusted model		Market model	
Event Window	%	t-statistic	%	t-statistic
Day -1	1.650***	3.93	1.503***	4.48
Day 0	7.992***	9.45	8.000***	23.85
Day 1	1.123***	2.76	1.064***	3.17
CAAR (-10, -1)	4.763	0.88	4.648	1.38
CAAR (+1, +10)	2.134	0.39	1.628	1.54
CAAR (-1, 0)	9.642***	3.97	9.503***	20.04
CAAR (-1, +1)	10.765***	3.62	10.567***	18.19
Panel B: Abnormal returns for low efficacy of corporate boards LBO subsample (N = 15)				
	Market-adjusted model		Market model	
Event Window	%	t-statistic	%	t-statistic
Day -1	0.633	1.31	0.679	0.94
Day 0	5.219**	2.16	4.876***	6.77
Day 1	0.528	0.72	0.582	0.81
CAAR (-10, -1)	1.987	0.51	1.963	0.86
CAAR (+1, +10)	1.406	0.88	0.983	0.43
CAAR (-1, 0)	5.852***	3.39	5.555***	5.46
CAAR (-1, +1)	6.379***	3.02	6.138***	4.92

Panel C: Differences between high - low efficacy of corporate boards LBO subsamples				
	Market-adjusted model		Market model	
	Differences	t-statistic	Differences	t-statistic
Day -1	1.018	1.59	0.824	1.10
Day 0	2.773	1.08	3.124	1.21
Day +1	0.595	0.71	0.481	0.72
	Differences	z-statistic	Differences	z-statistic
CAAR (-10, -1)	2.776***	8.86	2.685***	8.68
CAAR (+1, +10)	0.728***	4.03	0.645***	4.07
CAAR (-1, 0)	3.791***	2.74	3.948***	2.83
CAAR (-1, +1)	4.386***	4.49	4.429***	4.50

Notes: The table reports the average abnormal return and cumulative average abnormal returns calculated by the market model and the market-adjusted model aggregated across the cross-section of LBOs for each day within the event window. T-statistics are also reported. * denotes statistical significance at the 10% level. ** denotes statistical significance at the 5% level. *** denotes statistical significance at the 1% level.

Table 6: Average abnormal returns and cumulative average abnormal returns on LBO announcement days using as corporate governance measure the strength of investor protection.

Panel A: Abnormal returns for high strength of investor protection LBO subsample (N = 104)

	Market-adjusted model		Market model	
Event Window	%	t-statistic	%	t-statistic
Day -1	1.671***	3.37	1.626***	5.60
Day 0	7.794***	9.39	7.710***	26.56
Day 1	1.243***	2.72	1.241***	4.27
CAAR (-10, -1)	4.974	0.93	4.701	1.12
CAAR (+1, +10)	1.491	0.41	1.374	1.50
CAAR (-1, 0)	9.465***	3.98	9.337***	22.74
CAAR (-1, +1)	10.709***	3.67	10.577***	21.03

Panel B: Abnormal returns for low strength of investor protection LBO subsample (N = 34)

	Market-adjusted model		Market model	
Event Window	%	t-statistic	%	t-statistic
Day -1	1.156***	3.52	0.799	0.96
Day 0	7.195***	3.59	7.254***	8.73
Day 1	0.523	0.91	0.348	0.42
CAAR (-10, -1)	3.160	0.41	3.611	1.37
CAAR (+1, +10)	3.912	0.51	3.544	1.35
CAAR (-1, 0)	8.351**	2.43	8.054***	6.86
CAAR (-1, +1)	8.874**	2.11	8.401***	5.84

Panel C: Differences between high - low strength of investor protection LBO subsamples

	Market-adjusted model		Market model	
	Differences	t-statistic	Differences	t-statistic
Day -1	0.515	0.87	0.827	1.40
Day 0	0.599	0.28	0.456	0.21
Day +1	0.720	0.98	0.893	1.32
	Differences	z-statistic	Differences	z-statistic
CAAR (-10, -1)	1.814**	2.19	1.090	1.33
CAAR (+1, +10)	-2.421***	-13.94	-2.169***	-14.01
CAAR (-1, 0)	1.115	0.93	1.283	1.07
CAAR (-1, +1)	1.835**	2.15	2.176**	2.55

Notes: The table reports the average abnormal return and cumulative average abnormal returns calculated by the market model and the market-adjusted model aggregated across the cross-section of LBOs for each day within the event window. T-statistics are also reported. * denotes statistical significance at the 10% level. ** denotes statistical significance at the 5% level. *** denotes statistical significance at the 1% level.

Table 7: Regression results on the sources of shareholder wealth gains in European LBOs using abnormal returns (ARs) as dependent variable.

	Non-PSM		PSM	
	Market model	Market-adjusted	Market model	Market-adjusted
Intercept	0.047	0.052	0.087	0.093
	(0.83)	(0.90)	(1.41)	1.48
FCF	0.002***	0.002***	0.002***	0.002***
	(5.03)	(4.76)	(4.83)	(4.56)
Leverage	0.001	0.001	0.001*	0.001*
	(1.38)	(1.16)	(1.79)	(1.67)
Taxes-to-sales	-0.024	-0.025	-0.249	-0.257
	(-1.51)	(-1.53)	(-0.61)	(-0.62)
Distress	0.059**	0.058**	0.037	0.037
	(2.00)	(1.99)	(1.11)	(1.12)
ROE	0.001	0.001	0.001	0.001
	(0.60)	(0.60)	(0.78)	(0.66)
Deal size	0.033*	0.034*	0.042**	0.040*
	(1.84)	(1.93)	(1.97)	(1.86)
Club	-0.002	-0.003	0.024	0.022
	(-0.12)	(-0.14)	(0.84)	(0.76)
Size	-0.024*	-0.025*	-0.050***	-0.050***
	(-1.71)	(-1.76)	(-3.56)	(-3.40)
Growth	-0.028*	-0.029*	-0.026	-0.023
	(-1.85)	(-1.85)	(-1.56)	(-1.33)
Risk	0.005	0.005	-0.006	-0.006
	(0.20)	(0.21)	(-0.18)	(-0.19)
Undervaluation	-0.041*	-0.042*	-0.025	-0.028
	(-1.71)	(-1.78)	(-0.82)	(-0.91)
UK	0.023	0.022		
	(1.11)	(1.02)		
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
No. of Obs	137	137	72	72
Adjusted-R^2	0.144	0.132	0.122	0.106
F-statistic	2.52**	2.37**	1.90*	1.77*

Notes: The abnormal return (AR) on day 0 is the dependent variable. Independent variables include: Free cash flow (FCF) ratio defined as operating income before depreciation, amortization, interest expenses, taxes and dividends divided by companies' sales one year prior to the LBO deal. Leverage equals to the firm's total debt at the end of last fiscal year prior to LBO, divided by total equity. Taxes-to-sales equals to the firm's total income taxes at the end of last fiscal year prior to LBO, divided by total sales. Distress is a dummy variable equal to 1 if the company registered negative ROE in any of the two years prior to the announcement of LBO, and zero otherwise. ROE is the return on equity at the end of last fiscal year prior to LBO. Deal size is the logarithm of the LBO transaction value. Club is a dummy equal to 1 for club LBOs and 0 for sole-sponsored. Size is the logarithm of the firm's pre-going private total sales. Growth is Tobin's Q defined as the ratio of book value of debt plus the market value of equity divided by the book value of total assets. Risk is measured by beta from the regression of firm's abnormal returns in the pre-event period (-250, -11). Undervaluation is the difference between the logarithmic return of a firm stock price over 12 months and the logarithmic return of the market price index over the same period. UK is a dummy equal to 1 for UK target LBOs and 0 for non-UK LBOs. T-statistics based on White's (1980) heteroscedasticity-consistent standard errors are in parentheses beneath coefficient estimates. ***significant at 1% level, **significant at 5% level, *significant at 10% level.

Table 8: Regression results on the sources of shareholder wealth gains in European LBOs using the premiums as dependent variables.

	Non-PSM		PSM	
	Premium 1 day	Adj-Premium 1 day	Premium 1 day	Adj-Premium 1 day
Intercept	0.057	0.065	0.109	0.102
	(0.89)	(0.98)	(1.51)	(1.43)
FCF	0.002***	0.002***	0.002***	0.003***
	(4.99)	(4.75)	(4.53)	(4.77)
Leverage	0.001	0.001	0.002*	0.002*
	(1.56)	(1.32)	(1.76)	(1.88)
Taxes-to-sales	-0.026	-0.028	-0.304	-0.285
	(-1.44)	(-1.53)	(-0.64)	(-0.60)
Distress	0.064*	0.064*	0.038	0.039
	(1.90)	(1.90)	(0.99)	(1.00)
ROE	0.001	0.001	0.001	0.001
	(0.42)	(0.45)	(0.50)	(0.62)
Deal size	0.033	0.035*	0.041*	0.043*
	(1.65)	(1.81)	(1.69)	(1.77)
Club	0.001	0.001	0.030	0.032
	(0.02)	(0.01)	(0.82)	(0.89)
Size	-0.026*	-0.028*	-0.056***	-0.055***
	(-1.67)	(-1.80)	(-3.22)	(-3.31)
Growth	-0.033*	-0.034*	-0.027	-0.030
	(-1.88)	(-1.93)	(-1.37)	(-1.59)
Risk	0.006	0.006	-0.008	-0.007
	(0.21)	(0.20)	(-0.22)	(-0.19)
Undervaluation	-0.051*	-0.053*	-0.036	-0.034
	(-1.72)	(-1.77)	(-0.97)	(-0.91)
UK	0.026	0.023		
	(1.09)	(0.94)		
Year dummies	Yes	Yes	Yes	Yes
Industry dummies	Yes	Yes	Yes	Yes
No. of Obs	137	137	72	72
Adjusted-R^2	0.133	0.122	0.098	0.110
F-statistic	2.38**	2.25**	1.70*	1.80*

Notes: The dependent variables are raw and adjusted premiums of 1 day prior to the LBO announcement day. Free cash flow (FCF) ratio defined as operating income before depreciation, amortization, interest expenses, taxes and dividends divided by companies' sales one year prior to the LBO deal. Leverage equals to the firm's total debt at the end of last fiscal year prior to LBO, divided by total equity. Taxes-to-sales equals to the firm's total income taxes at the end of last fiscal year prior to LBO, divided by total sales. Distress is a dummy variable equal to 1 if the company registered negative ROE in any of the two years prior to the announcement of LBO, and zero otherwise. ROE is the return on equity at the end of last fiscal year prior to LBO. Deal size is the logarithm of the LBO transaction value. Club is a dummy equal to 1 for club LBOs and 0 for sole-sponsored. Size is the logarithm of the firm's pre-going private total sales. Growth is Tobin's Q defined as the ratio of book value of debt plus the market value of equity divided by the book value of total assets. Risk is measured by beta from the regression of firm's abnormal returns in the pre-event period (-250, -11). Undervaluation is the difference between the logarithmic return of a firm stock price over 12 months and the logarithmic return of the market price index over the same period. UK is a dummy equal to 1 for UK target LBOs and 0 for non-UK LBOs. T-statistics based on White's (1980) heteroscedasticity-consistent standard

errors are in parentheses beneath coefficient estimates. ***significant at 1% level, **significant at 5% level, *significant at 10% level.

Table 9: Operating characteristics between LBO and non-LBO firms.

Panel A: Revenues growth of the last fiscal year prior to the buyout announcement for LBO and non-LBO firms				
	LBO Firms	Non-LBO firms		Significance tests
Mean	0.164	0.161	Difference in means	0.003
			Two-tailed test p-value	0.935
Median	0.082	0.128	Difference in medians	-0.046*
			Wilcoxon/Mann-Whitney p-value	0.090

Panel B: EBITDA margin of the last fiscal year prior to the buyout announcement for LBO and Non-LBO firms				
	LBO Firms	Non-LBO firms		Significance tests
Mean	0.196	0.111	Difference in means	0.085
			Two-tailed test p-value	0.207
Median	0.145	0.143	Difference in medians	0.002
			Wilcoxon/Mann-Whitney p-value	0.946

Panel C: Standard deviation of EBITDA margin 3 fiscal years prior to the buyout announcement for LBO and Non-LBO firms				
	LBO Firms	Non-LBO firms		Significance tests
Mean	0.025	0.031	Difference in means	-0.007
			Two-tailed test p-value	0.233
Median	0.013	0.016	Difference in medians	-0.003*
			Wilcoxon/Mann-Whitney p-value	0.085

Panel D: Capital expenditures to total assets of the last fiscal year prior to the buyout announcement for LBO and Non-LBO firms				
	LBO Firms	Non-LBO firms		Significance tests
Mean	0.035	0.062	Difference in means	-0.027**
			Two-tailed test p-value	0.041
Median	0.033	0.051	Difference in medians	-0.018**
			Wilcoxon/Mann-Whitney p-value	0.026

Panel E: ROA of the last year before buyout for LBO and Non-LBO firms				
	LBO Firms	Non-LBO firms		Significance tests
Mean	0.082	0.088	Difference in means	-0.005
			Two-tailed test p-value	0.685
Median	0.081	0.089	Difference in medians	-0.008
			Wilcoxon/Mann-Whitney p-value	0.579

Panel F: Debt-to-equity ratio of the last year before the buyout period for LBO and Non-LBO firms				
	LBO Firms	Non-LBO firms		Significance tests
Mean	0.635	0.692	Difference in means	-0.057
			Two-tailed test p-value	0.673
Median	0.534	0.564	Difference in medians	-0.030
			Wilcoxon/Mann-Whitney p-value	0.146

Notes: The variables comparing the operating characteristics of firms undergoing an LBO relative to a matching sample include the revenues growth (REVEGR), the EBITDA margin (EBITDAM), capital expenditure (CAPEX), the return on assets (ROA) and debt-to-equity ratio (Leverage) at the end of the last fiscal year prior to the deal announcement as well as the standard deviation of EBITDA margin 3 years prior to the buyout announcement (EBITDAVOL). The equality tests employed are the two-tailed test for differences in means and the Wilcoxon Mann-Whitney test for differences in medians.
***significant at 1% level, **significant at 5% level, *significant at 10% level.

Table 10: Logistic regression analysis of LBO likelihood.

Panel A: Logit results

Variables	z-statistic (p-values)
Intercept	0.419 (0.352)
REVGR	0.709 (0.309)
EBITDAM	2.325** (0.043)
EBITDAVOL	-12.446* (0.056)
CAPEX	-4.284* (0.093)
ROA	-3.612 (0.196)
Leverage	-0.192 (0.424)
N	274 (137 x 2)
McFadden R^2	0.045

Panel B: Marginal effects

Variables	dx/dy	Standard Error	Z	P>|z|
REVGR	0.177	0.179	0.99	0.323
EBITDAM	0.581	0.339	1.71	0.087
EBITDAVOL	-3.111	1.699	-1.83	0.067
CAPEX	-1.071	0.544	-1.97	0.049
ROA	-0.902	-0.611	-1.48	0.140
Leverage	-0.048	-0.051	-0.95	0.343

Notes: The dependent variable is a dummy that equals 1 if the company is an LBO target and 0 otherwise. REVGR is revenues growth at the end of the last fiscal year prior to announcement, EBITDAM is the ratio of EBITDA divided by revenues at the end of the last fiscal year prior to announcement, EBITDAVOL is the standard deviation of EBITDA in the last 3 fiscal years prior to the announcement of LBO, CAPEX is defined as capital expenditures divided by total assets at the end of last fiscal year prior to announcement, ROA is defined as EBIT divided by total assets in the last fiscal year prior to announcement, Leverage is total debt divided by total equity at the end of the last fiscal year prior to announcement. Probability value associated with the z-statistic that a coefficient is statistically different from zero is given in parentheses. Standard error estimates are robust to heteroscedasticity (Huber/White). ***significant at 1% level, **significant at 5% level, *significant at 10% level.

Appendix

Description of the variables used.

Variable Name	Variable Code	Description
Free cash flow	FCF	Operating income before depreciation, amortization, interest expenses, taxes and dividends divided by companies' sales at the end of the last fiscal year prior to announcement.
Leverage	Leverage	Total debt divided by total equity at the end of the last fiscal year prior to announcement.
Taxes shield	Taxes-to-sales	Total income taxes divided by total sales at the end of last fiscal year prior to announcement,
Distress	Distress	A dummy that takes the value of 1 if the company registered negative ROE in any of the two years prior to the announcement of LBO, and 0 otherwise.
Profitability	ROE	Net income divided by total equity at the end of last fiscal year prior to announcement.
Deal size	Deal size	Logarithm of the LBO transaction value.
Firm Size	Size	Logarithm of total sales at the end of the last fiscal year prior to announcement.
Club sponsoring	Club	A dummy that takes the value of 1 for club LBOs and 0 for sole-sponsored.
Growth Opportunities	Tobin's Q	Book value of debt plus the market value of equity divided by the book value of assets at the end of last fiscal year prior to announcement.
Systematic Risk	Risk	Beta as calculated from the regression of firm's abnormal returns in the pre-event period (-250, -11).
Undervaluation	Undervaluation	Difference between the logarithmic return of a firm stock price over 12 months and the logarithmic return of the market price index over the same period.
Revenues Growth	REVGR	Revenues growth at the end of the last fiscal year prior to announcement.
Maturity	CAPEX	Capital expenditures ratio defined as capital expenditures divided by total assets at the end of last fiscal year prior to announcement.
Cash flow generation	EBITDAM	EBITDA margin defined as the ratio of EBITDA divided by revenues at the end of the last fiscal year prior to announcement.
Cash flow volatility	EBITDAVOL	Standard deviation of EBITDA in the last 3 fiscal years prior to announcement.
Operating efficiency	ROA	EBIT divided by total assets at the end of the last fiscal year prior to announcement.