

Corporate governance and LBO targets

Thesis
MSc. Accounting and Finance
Erasmus University Rotterdam
Erasmus School of Economics

Coach: Jochen Pierk
Co-reader: Sander Renes
Author: Max van Soest
Student ID: 425697ms

The content of this thesis is the sole responsibility of the author and does not reflect the view of either the supervisor, second assessor, Erasmus School of Economics or Erasmus University.

Abstract

This study aims to determine whether there is a relation between firms' corporate governance and becoming a target of a leveraged buyout transaction (LBO). Expected is that firms with higher levels of corporate governance are more likely to be targeted with an LBO transaction. The findings show no significant difference between the corporate governance of LBO firms compared to firms that are not targeted (non-LBO). This outcome is based on a self-constructed corporate governance index measure. Of the four corporate governance characteristics used for the index to determine the relation, only 1 shows a significant relation. This relation implicates the importance of the level of independent directors on the board of a company because it has a positive effect on becoming an LBO target. However, in general, corporate governance is not that important to private equity (PE) firms, likely because the corporate governance can be changed after acquiring the firm. This study contributes to prior literature on corporate governance that characteristics considered positive for firm performance are not as important as initially thought. Furthermore, it contributes to the previous literature on LBOs that better-performing firms are not per se targets of LBOs although, financial health is essential.

(Keywords: Corporate governance, Leveraged buyout, Board size, Institutional ownership, Director independence, Audit committee independence, Free cash flow, Leverage)

Table of Contents

1. Introduction.....	4
2. Theoretical background and hypotheses development.....	7
2.1 Leveraged Buyout.....	7
2.2 Corporate governance	7
2.3 Prior literature corporate governance and LBO.....	8
2.4 Hypothesis development	11
3. Research design.....	13
3.1 Theoretical relations and operationalization	13
3.1.1 Corporate governance index	13
3.1.2 Index variable choice	14
3.2 Nearest matching.....	15
3.3 Control variables	16
3.4 Regression	17
3.5 Sample and data	17
4. Results.....	22
4.1 Index regression results.....	22
4.2 Decomposed model results.....	22
4.3 Unmatched regression.....	24
4.4 Robustness test.....	24
5. Conclusion	27
5.1 Results summary.....	27
5.2 Contribution to prior literature	27
5.3 Alternative explanation	28
5.4 Limitations and future research	28
Appendices.....	29
References.....	31

1. Introduction

This study focuses on the level of corporate governance of a firm targeted by a private equity (PE) firm with an LBO transaction. With an LBO transaction as focussed on by this study, a PE firm buys out all the shares of a public firm at a premium. By doing this, the PE firm becomes the owner of the acquired firm and takes it private by buying the publicly traded shares. Of course, LBOs also happen at private firms, and not always the entire company is acquired, but this study focuses on public firms that are acquired for 100%. The study aims to determine whether firms with a higher level of corporate governance are more likely to be targeted with an LBO transaction. So, the research question is: “Are companies with a higher level of corporate governance more likely to be LBO targets?”

Within the world of PE and mergers and acquisitions, a vital strategy to acquire a publicly traded or private company is by conducting an LBO. The research on this acquiring strategy goes back for decades but seems extra relevant nowadays. According to (Scigliuzzo et al., 2020), 2021 is expected to be the year for LBOs, caused by relatively less action in 2020 due to the COVID-19 pandemic. This makes this study extra relevant because of the topicality. Another reason for this research is that in prior literature, LBO transactions are mainly examined from 1995 until 2007. This research is focused on LBO transactions between 2010 and 2020, which makes the outcomes and implications concentrate on the contemporary time.

The transaction value of the LBOs best explains the economic relevance of this study. In the period between 2010 and 2020, there were 323 LBO transactions of US firms only. These 323 LBO transactions have a combined transaction value of 424 billion dollars. This shows the magnitude of the acquiring strategy and the influence it might have on the economy.

Apart from that, the different intentions of the PE firm matter a lot for the stakeholders of the firm that is targeted. An LBO is an aggressive strategy to acquire a company, which could have positive or negative effects on the stakeholders of the acquired firm. Buy and build strategies, for example, have positive effects such as a higher market share for the firm and possibly more employment opportunities. Adverse effects can occur when the PE firm believes that the acquired company is worth more when sold as separate parts. This causes significant layoffs, which are harmful to stakeholders like employees and disrupts the firm, and all the effort and time invested by the management becomes worthless. Stakeholders like the board of directors could be replaced by new board members, or cope with some new members on the board appointed by the PE firm as they obtained control of the firm after receiving all of its shares. These examples show that no matter the intentions of the PE firm, there are consequences for the target firm and its stakeholders.

In prior literature on LBOs, the focus was mainly aimed at the financial performance of the firm that is taken private. Before a firm is taken private, the PE firm looks at the financials, such as the free cash flows, to develop an understanding of the financial health situation of the firm. This is a logical procedure since the PE firm needs to check whether it is a good

investment or not. Another part of the prior literature focused on the firm's corporate governance changes because of the LBO. For example, the PE firm that acquires the company is now the company's owner, resulting in changes in the board. Relative to this prior literature, this research focuses on the gap between these two streams in the literature. In this research, the determinant "financial performance" is replaced by the level of corporate governance, and by doing this, the two prior researched streams are combined into a new one.

To answer the research question, I use data on 91 US companies that are taken private through an LBO transaction between 2010 and 2020 effectively. For these firms, I create a corporate governance index based on the following variables: Audit committee independence; Board size; Institutional ownership, and Director Independence. This index is also made for US public firms that stayed public, nearest matched with the firms that went private based on enterprise value, year, and industry (Cao et al., 2019). These firms were possible alternatives for investments at the time, so they are used for comparison. This results in a total sample of 182 firms. This matching is essential because of the endogeneity concerns which might arise otherwise. Meaning that if these firms were not matched based on enterprise value, year, and industry, the found relation between the independent variable (corporate governance index) and the dependent variable (LBO target or non-LBO target) might be influenced by a third variable such as enterprise value, year or industry. A logit regression is used to see whether the corporate governance index for firms taken private through an LBO is significantly different from the index of firms that stayed public. After conducting this test, the individual factors of the index are regressed to see which factors show a positive effect on becoming an LBO target. In the regression, control variables like free cash flow and leverage are included. Also, year and industry fixed-effects are included.

The findings provide an answer to the research question on the level of corporate governance and becoming an LBO target. An insignificant relation is found between the corporate governance of firms and the likelihood of being an LBO target. This insignificance indicates no significant difference between LBO firm's level of corporate governance compared to non-LBO firms. However, one separate variable of the governance index shows a significant relation with the dummy variable, namely director independence. A positive relation is found, indicating that a larger portion of independent directors on board is related to becoming an LBO target. These findings together conclude that neither good nor bad governed firms are more likely to be an LBO target because there is no significant relation between corporate governance and being an LBO target.

In prior literature, some corporate governance characteristics are considered to be positive for firm performance. For example, smaller boards are considered more efficient in decision-making, which should be related to better performance. This study contributes to the prior literature on corporate governance that the four variables used for this study, based on previous literature, do not have the expected effect. Although insignificant, the coefficients of board size and institutional ownership are negative. A contribution to the prior literature on LBOs is that this study concludes there is no relation between corporate governance and becoming an LBO

target. Furthermore, the control variables of this research show that the height of free cash flows is not related to being an LBO target. Only leverage shows a clear relation, indicating that financial health in terms of debt is an important characteristic of LBO targets.

An implication of this research for PE investors is that director independence is related to LBO targets, meaning that a used determinant by possible competitors is found. For firms not willing to be an LBO target, this means that having fewer independent directors on the board makes them less attractive for an LBO. Furthermore, the governance variables seem unimportant for investors. This might be caused by the power a PE firm obtains when the company is acquired. The investor can change these governance characteristics. This implication is dependent on the power of the investors on the company in which they invest.

2. Theoretical background and hypotheses development

This section explains the basic theoretical concepts of leveraged buyouts and corporate governance. Furthermore, this section offers a broad overview of the prior literature on both concepts. Finally, based on this prior literature, the reasoning behind and formulation of the hypotheses can be found at the end.

2.1 Leveraged Buyout

The number of LBOs started to increase during the 1990s as a corporate organizational form. In this period, Jensen (1986) even considered the structure to be the dominant structure for companies in the future. However, a few years later, due to the junk bond crash, important LBOs started to go bankrupt. This caused the disappearance of LBOs for a few years, but it began to get popular again around 2006 when a large amount of capital was possessed by PE firms (Kaplan and Stromberg, 2009).

First, it is important to understand what the basic idea of an LBO is. LBOs are executed mainly by PE firms. A PE firm buys a publicly listed company by purchasing all the outstanding shares. This is mostly done at a premium between 15% and 50% above the current stock price. These shares are no longer available on the stock exchange after the transaction, which means the publicly traded company is now private. It is called an LBO because a large amount of debt finances these types of transactions. A large part of the capital (between 60% and 90%) used for the transaction is lent and backed with the assets and cash flows of the company that is acquired. The remaining 10% to 40% of capital is provided by the PE firm, which uses the investment funds they obtain from their investors (Kaplan and Stromberg, 2009). Because of this acquiring strategy, the acquired firm has a large debt that needs to be paid off with the future free cash flows to the debt holders (Andres et al., 2007).

Most PE funds are limited to a contractually set lifetime. Because of this lifetime, the PE firm can't keep the acquired company as long as they want. There are three most common ways an LBO transaction ends. The first possibility is that the company is sold to a strategic buyer. The second option is a secondary LBO, this means that the company is sold to another PE firm using an LBO transaction. The third option is an initial public offering (IPO). With an IPO, the shares get released back on the stock market again and are open to being sold to every investor active on that stock market (Kaplan and Stromberg, 2009).

The PE firm can change the acquired company because it owns the company after buying all the stocks. Based on a survey among general partners involved in these specific deals, Acharya et al. (2009) find that a governance-related change is set to light. The boards usually get smaller and gather more frequently. A bigger impact is that 39% of the chief executive officers are replaced within 100 days and 69% within four years.

2.2 Corporate governance

A general problem within firms is the division between the incentives of the management and what is best for the firm's shareholders. The motives of these two groups can differ, causing

agency costs. The corporate governance of these public firms consists of monitoring mechanisms that aim to reduce these agency costs (Dey, 2008). Although the PE firm becomes the owner of all the company's shares, the managers can still have the same reasons for operating the firm in a certain way. The larger the agency conflicts, the better the governance mechanisms must be to reduce these conflicts as much as possible.

Dey (2008) researched the relation between corporate governance and agency conflicts. One of the results is that a higher level of agency conflicts is related to firms with better governance mechanisms. This is likely because a higher level of agency conflicts results in adopting better governance mechanisms to cope with the disputes. From the seven dimensions created by Dey, the better governance mechanisms are especially based on the composition and function of the board of directors, the audit committee, and the independent auditor. The results of this paper support the theory that governance can be seen as a response to a firm's business and environment. The effect of governance on firm performance is also measured through agency costs. Firms with higher agency costs, who generally have better governance mechanisms, also relate to better overall firm performance. This statement is also in line with the general thought that governance is not a "one size fits all" thing because of, for example, the influence of the size of the firm (Dey, 2008).

Depending on regulations, some parts of corporate governance are regulated by the rules that apply in the country in which the company operates. The corporate governance of a firm is a relatively large subject that covers a more human aspect as well as the efficiency and business aspect. A large provider of corporate governance-related information to institutional investors is called the Institutional Shareholders Services (ISS). They split firms' corporate governance into the following eight categories: audit, board of directors, charter/bylaws, director education, executive and director compensation, ownership, progressive practices, and state of incorporation (Brown and Caylor, 2006). When an LBO transaction happens, some of these eight categories will change because of the new owner. This will change the corporate governance, which indicates some kind of relation between corporate governance and LBO transactions.

2.3 Prior literature corporate governance and LBO

Cornelli and Karakas (2008) researched a corporate governance change by comparing the board of a firm that is taken private through an LBO before the transaction happened and afterward. After the company is taken private, there are on average 31% of LBO sponsors represented on the board. The percentage of the LBO sponsors on the board can be divided into two parts based on whether the CEO is replaced. If the CEO is not replaced, the PE firm seems to have more confidence in the firm's management, resulting in 25% LBO sponsors on the board. On the other hand, if the CEO is replaced, the percentage of LBO sponsors on the board is on average 37%. In this case, the PE firm does not trust the effectiveness of the management and likes to have a bigger share on the board to gain more power and supervision. This finding indicates the involvement of PE firms in the acquired companies and shows the consequence for the current board. They are either replaced by the LBO sponsors or have to cope with the LBO sponsors being on the board of directors. This indicates the relevance for board members of a firm to

know whether and why they are a possible target for an LBO transaction.

In a paper by Holstrom and Kaplan (2001), the history and development of US corporate governance are explained. The governance system of the 1980s of the hostile takeovers and LBOs has changed over time to the more incentive-based compensation with active boards and shareholders. This change is mainly caused by the growing importance of stock prices for the management of the companies. This market-based system is strongly developed over time and started to be adopted by other countries as well. However, the new governance system is predicted to stay, which causes the firms to change. This indicates the importance of the incentives and influence of managers in the way a firm is governed. Looking at the explained change from this research, the managers have a bigger stake compared to the shareholders in determining how a firm is governed and run.

There are some interesting theories on the new capital structure and its positive impact on the firm that is taken private. When the LBO boom happened in the 1980s, many said that this positively impacted the governance structure by aligning the incentives between management and shareholders. This idea is based on Jensen's free cash flow hypothesis, a frequently mentioned theory in prior literature. According to this hypothesis, a firm should have high free cashflows with not too many investment opportunities. In this situation, the agency costs are low because after financing positive net present value projects, the most logical way to spend the free cash flows is by paying off debts (Jensen, 1986). This explains the benefits of having debt for reducing the agency costs created by free cash flows. This hypothesis fits perfectly with the way an LBO is financed. A large amount of debt used to acquire the company gets reduced as quickly as possible, using the free cash flows. A large amount of debt also has a positive influence on the tax shield of the company. Because the leverage increased significantly through the LBO, a higher level of interest expenses can be reduced. This tax shield lowers the firm's cost of capital (Kaplan and Stromberg, 2009). In combination with creating more value for the acquired firm, the LBO acquiring strategy is profitable after selling the company in one of the three earlier explained ways.

Nikoskelainen and Wright (2007) do not support the hypothesis of Jensen but look at the LBO and performance from the view of the size of the firm. They found that in large firms, the management's equity stake is a good determinant for the internal rate of return of the LBO. Larger firms provide higher returns to the PE firm because in contrary to the smaller firms, larger firms are less likely to go bankrupt. Larger firms can have multiple business lines, which stabilizes the enterprise performance. Another way of looking at the higher returns from larger acquired companies is based on the invested capital amount. The investing firm, mostly PE, has more risk when investing a large amount in a high-value firm. To lower the risk, larger firms get more assistance and guidance from the investor than smaller firms. This higher level of control, supervision, and support results in better performance and higher returns.

The effect of corporate governance on the free cash flows is proven by Lin and Lin (2016). Their study provides results that show that better-governed firms have larger free cash flows and high performance. These free cash flows are likely to be the result of better internal

operating efficiency. This contrasts with Jensen's free cash flow hypothesis on the connection between high free cash flows and high agency costs. Combining the two theories shows the relation between corporate governance and free cash flows and the importance of free cash flows for LBO transactions.

Mehran and Peristiani (2010) showed with their results that the likelihood of firms going private in the US depends on the free cash flows. They present a highly significant relation between free cash flows and the possibility of an LBO. These free cash flows are linked to the level of governance of a firm, as can be seen from the results of Lin and Lin (2016). According to Jensen's free cash flow hypothesis, these free cash flows are also important for paying off the debt for the PE firm (1986). Based on these three found relations, the assumption is made that the corporate governance of a firm is of influence on the PE firm in determining to target the firm with an LBO.

In contrast to this reasoning, it can be said that the PE firm becomes the owner of the company so it can shape the corporate governance of the acquired firm. For example, changing the board of directors as seen in the results from Cornelli and Karakas (2008). These changes cause the PE firm lots of work and afford of the acquired firm's employees to adapt to these changes. This causes extra costs which are not needed if the corporate governance was already on a higher level. Furthermore, the firm's management can choose not to comply with all the governance changes by the PE firm. This can be problematic for the PE firm because they are dependent on the experience and expertise of the management, who knows the daily routine of the company better than the PE firm does.

In research of UK listed firms by Guest (2009), the relation between board size and firm performance is measured. In the UK, boards' monitoring role is much weaker than the monitoring role of US boards. This makes the outcome of this research even more interesting translated to the US because it shows the effectiveness of the board measured by the board size. The outcomes show a negative relation between board size and firm performance, which indicates that a smaller board is better for the firm performance. This established relation is in line with the reasoning that larger boards are ineffective in communication and decision-making. This found relation shows the influence of corporate governance characteristics such as board size on a firm's performance.

In a paper by Gibbs (1993), the importance of free cash flow, corporate governance, and takeover threat is researched. The main takeaway from this paper for this study is the positive influence of independent directors on a company's board. Having independent directors present is considered better for corporate governance because they monitor self-interested behaviour on the board. They act as watchdogs and are actively involved in committees. These findings support the theory of agency problems being minimized by corporate governance restructuring. In the end, the importance of outside/independent directors in this process is emphasized.

Whether LBO transactions are more likely in good or bad governed firms can be seen from both perspectives. On the one hand, bad corporate governance is expected to harm the firm performance, which results in lower profits and free cash flows (Lin and Lin, 2016). The lower performance also relates to a lower value of the firm, which makes the firm cheap to acquire for the PE firm. The stocks of these firms are also less liquid, making them more desirable to go private (Bharath and Dittmar, 2010). Bad corporate governance also leaves room for improvement for the acquirer, making it easier to add value to the firm and yield a higher return on the investment. From the bad corporate governance perspective, there are some advantages for the PE firm but also a higher risk due to lower performance. On the other hand, firms with a higher level of corporate governance have higher free cash flows due to better- operating efficiency. These free cash flows are useful for paying off the large amount of debt used for the LBO.

Finding out what factors are better for corporate governance and whether the firm's governance has an impact on the attractiveness of the firm towards PE firms can have some important implications. The answer to this question is relevant to the stakeholders of the firm who are not willing to be a target of an LBO. For example, the board of directors who directs and manages the firm and are the ones who control the governance of the firm. Because of an LBO transaction, the ownership of the company switches to the PE firm that acquired the company. To create value and make a profit on the transaction, the firm is changed in certain parts. For example, to oversee the business and supervise the management, the board of directors might be shaped differently by the PE firm. So, finding out whether the level of corporate governance of a firm influences the probability of becoming an LBO target can be important to know for a board of directors.

In contrast to this, it is useful for PE firms to know which characteristics of firms are mostly used to determine to target a firm with an LBO. Therefore, results from this research can show insights into transactions made by other PE firms related to LBOs. In addition, it can show characteristics that are not new but not yet connected to LBOs.

2.4 Hypothesis development

The first hypothesis of this research is:

H1: The level of corporate governance of a company has a positive effect on becoming an LBO target.

This hypothesis is based on several found relations in the prior literature on corporate governance and LBOs. First, from Mehran and Peristiani's (2010) results, the positive relation between free cash flows and the likelihood of being targeted by an LBO is shown. This relation, combined with the results from Lin and Lin (2016) of the positive relation between the level of corporate governance and free cash flows, shows the potential positive effect corporate governance has on becoming an LBO target. Also, considering the free cash flow hypothesis of Jensen (1986), based on the agency costs revolving around free cash flows and the solution of using the free cash flows for paying off debt to reduce these agency costs fits with the procedure of an LBO. Furthermore, governance mechanisms to cope with agency conflicts show the importance of corporate governance for directing a company (Dey, 2008). Also, the

changes made in the governance after an LBO transaction happened show the acknowledgment of PE firms for the importance of corporate governance of a company. Another important key aspect for the hypothesis is to keep the basic idea of an LBO in mind. The company is held by the PE firm for a few years, in which a part of the debt is paid off. The end of an LBO is in some of the three ways identified to be the most used exits. These possible exits are a secondary LBO, selling the company to a strategic buyer, or release the company back on the public market through an IPO. To make the most profit on the investment, the amount of debt paid off needs to be as large as possible. Based on this idea, the relation of governance and free cash flows described by Lin and Lin (2016) is decisive for formulating the H1.

The level of corporate governance is tested by using four different variables combined into one corporate governance index. This index consists of director independence, audit committee independence, board size, and institutional ownership. These four variables are measured in such a way that a higher score indicates a higher level of corporate governance for each specific variable. The measurements are based on the found effects of the variables from prior literature. The following hypotheses are formulated for the four corporate governance variables:

- H2: The level of director independence of a company has a positive effect on becoming an LBO target.*
- H3: The level of audit committee independence of a company has a positive effect on becoming an LBO target.*
- H4: The level of board size of a company has a positive effect on becoming an LBO target.*
- H5: The level of institutional ownership of a company has a positive effect on becoming an LBO target.*

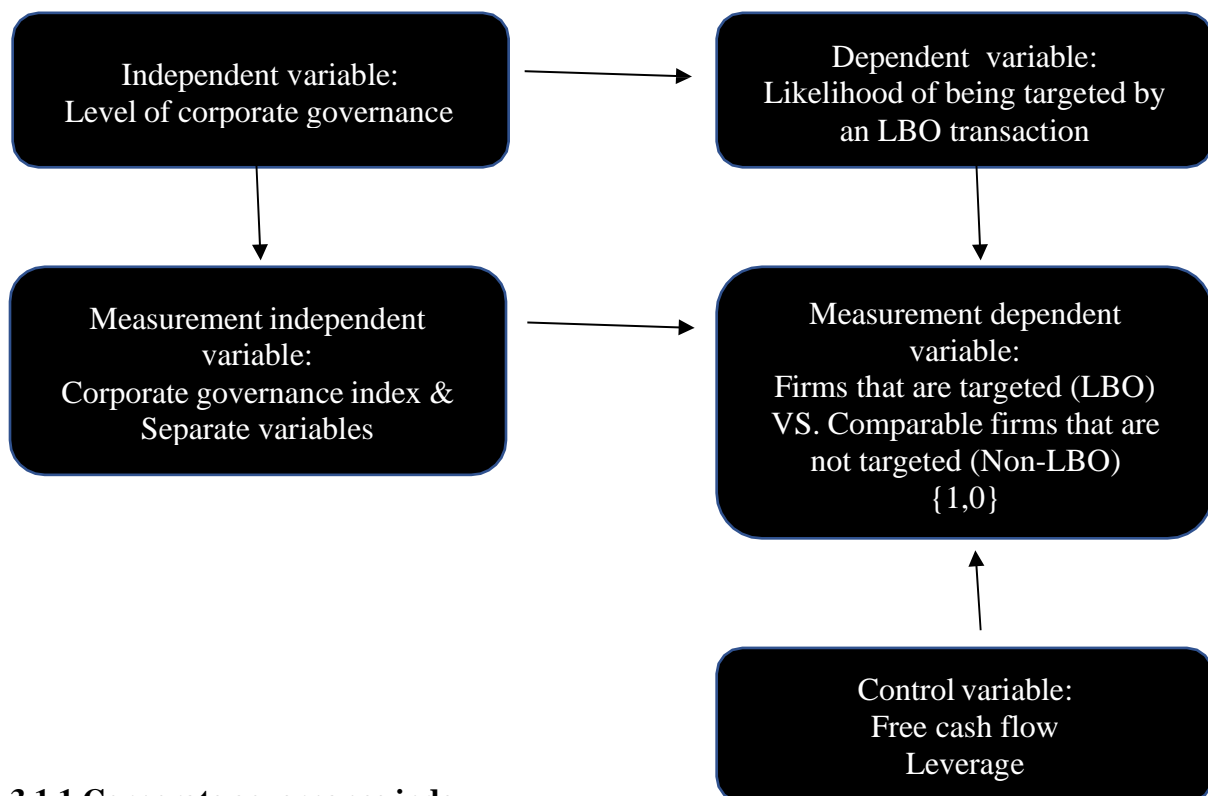
3. Research design

This section covers the fundamental parts of the research design. Operationalization of the theoretical construct, sample selection, and variable choice. Furthermore, the data retrieval process is explained. In the end, the descriptive statistics are presented, which are used to obtain the results to answer the hypothesis.

3.1 Theoretical relations and operationalization

The goal of this research is to find out whether the level of corporate governance of a firm is related to becoming an LBO target. The operationalization of good or bad corporate governance is done by valuing the level of corporate governance of a firm as an index. To give a graphic display of the relation this research aims to investigate, the following Libby boxes are created:

Figure 1: Libby boxes



3.1.1 Corporate governance index

To find answers to the hypotheses, the measurement of corporate governance is most important. A well-known governance index in the literature is created by Gompers et al. (2003), although it is not created by only Paul Gompers, it is often referred to as the Gompers Index. The same construction as this index is used to create a new index for measuring the level of corporate governance. The Gompers index is focused on the shareholder rights related to corporate governance. In the index created for this research, the focus will be more on the provisions considered better for performance or governance in general. The higher a firm scores on the created index, the higher the level of corporate governance. Some variables in the index are dummies and can either score a 0 or a 1, while other variables can score everything between 0

and 1. The variables used to build the index are based on prior literature on governance provisions and their importance for performance or overall governance.

3.1.2 Index variable choice

First, the presence of independent directors is mentioned in a paper by Gibbs (1993). The presence of independent directors is important for lowering the agency costs created by the differences between shareholders and the management of a firm. Independent directors can be identified as members of the board of directors who are autonomous. This means that they are not shareholders of the firm nor part of the management team. This makes their role on the board vital because they are the ones who can monitor for self-serving behaviour. Self-serving behaviour is either in favour of the shareholders or of the management, causing agency costs. Given the importance of director independence on a board, the number of independent directors is divided by the total number of directors on the board (Appendix II). This causes values between 0 and 1 for the index, showing the relative strength and power of independent directors against the other board members.

The size of a board influences the efficiency of communication and decision-making within the board, as Guest (2009) shows. These results show a negative relation between board size and firm performance, indicating that larger boards are worse for firm performance. Performance is considered important for PE firms because it relates to free cash flows which are useful in LBOs. Smaller firms are likely to have smaller boards, relative to larger firms. To make the index comparable between firms, the number of directors on the board must be measured relative to the size of the firm. First, the logarithm is taken of the enterprise values to make them smaller and more useful for division. Then, the logarithm of the enterprise value is divided by the number of directors on the board (Appendix II). This causes values between 0 and 1, which can be added to the index. By dividing the two numbers this way, relatively smaller boards score higher for the index. This is correct for the construction of the index since smaller boards are considered better for corporate governance due to their efficiency.

In the paper by Dey (2008), multiple governance variables are researched to determine their importance for governance concerning agency conflicts. One of these variables is the presence of an independent audit committee. Audit committees are important for overseeing the financial reporting process. The oversight of this process is essential because managers could manage their earnings to present a misleading representation of the company's financials. This causes agency costs because the management misleads the shareholders. This also has implications for the PE firm, which is willing to buy out the company. If their financials show a false representation of the reality, the PE firm might invest based on incorrect information. Dey (2008) shows that the auditor's independence is significantly related to firm performance and considered as better governance. This variable is given 1 point if all the audit committee members are independent and 0 if one or more are not independent (Appendix II). This is the same measuring technique as used in the Dey paper.

Another governance level measurement technique presented by Dey (2008) is related to the ownership structure. A higher level of institutional ownership is positively related to the performance of the company. Institutional owners are shareholders with a relatively high percentage of the shares compared to regular shareholders. A similar result is shown in another paper by Larcker et al. (2007). Their results show a positive relation between their principal component variable institutional ownership and firm performance. It could be said that this variable is not interesting because the PE firm becomes the owner of all the shares, so there will be no other institutional shareholders anymore. The reason for adding this variable is that the firms with higher levels of institutional shareholders in their public status are already familiar with how such shareholders could influence them. This makes the transition to an even larger owner/shareholder as a PE firm easier. Another reason is for the completeness of the index because, in previously made governance indices, there is always an ownership-related variable included. Another reason is that shares held by institutional owners might be harder to buy, even at a premium. The institutional owners have more benefits of keeping their shares, looking at possible price increases causing profits. Institutional ownership is calculated as the number of shares owned by institutional owners, divided by the total amount of shares outstanding (Appendix II).

The definitions and calculations of the four governance variables used for the index can be found in Appendix II. Every aspect of the corporate governance measure is equally weighted in the index. All the elements can score between 0 and 1, so for the four variables included, the total score can differ between 0 and 4 for each company. This index is made for all US firms that went private through an LBO between 2010 and 2020. The same index is constructed for comparable firms that remained public, to make a comparison between these indices.

$$\text{Index} = (\text{Directors Independence}) + (\text{Audit Committee independence}) + (\text{Board size}) + (\text{Institutional Ownership}) \quad (1)$$

A Pearson correlation matrix is included in Appendix III to check for multicollinearity. This must be done because multicollinearity causes endogeneity in the research. Holding the threshold at 0.70, there is no multicollinearity between these variables because there are no correlations between the independent variables above the 0.70 (Kalnins, 2018).

3.2 Nearest matching

The created governance index must be compared between LBO firms and non-LBO firms. Just randomly comparing firms gives a biased result. Instead, every LBO firm is nearest matched with a non-LBO firm to see whether the governance characteristics are the reason why the PE firm chose the LBO firm and not the non-LBO firm. Based on the year, industry, and enterprise value, these LBO firms are nearest matched with non-LBO firms that stayed public between 2010 and 2020. These matching characteristics are based on the paper by Cao et al. (2019), using the same variables.

The goal is to find out why the LBO firms are targeted and not another company available at the time of the acquisition. So, the characteristics of these firms must be compared within the same year. The interests of this study are the governance determinants of PE firms in targeting

LBO firms. So, the last public year of the firm that is taken over is the year of interest. Nearest matching the firms on year causes a reliable comparison between the options presented in the year of acquisition. A frequently used way of matching firms is based on the industry. The PE firm needs to have faith in the industry in which they acquire a company. For example, it is not likely that a PE firm will invest in a company from an industry that is reduced in size and not likely to get back on the old level again. Standard Industrial Classification (SIC) codes are used to specify the industry of companies. Nearest matching the LBO firms with non-LBO firms based on a 3-digit SIC code causes a more reliable comparison between the firms.

Smaller firms are not the same as larger firms, looking at the governance as well as the investment needed to buy all the shares of the company. The control and effort put into the acquired firm are different between larger and smaller firms (Nikoskelainen and Wright, 2007). This difference is caused by the larger amount invested, causing more risk of the investment. More assistance and guidance are put in the acquired firm by the PE firm to lower this risk. This indicates the importance of matching the LBO and non-LBO firms based on size to make comparable investment matches. The transaction value of LBO firms is known, but not for the non-LBO firms. That is why the size is measured by the enterprise value, which is closest to the transaction value of buying a public firm.

3.3 Control variables

A variable that keeps coming back in the literature on LBOs is the free cash flow. The free cash flow is seen as a determinant for PE firms to target a company with an LBO, because of its usefulness to pay off the created debts (Mehran and Peristiani, 2010). Also, the expected relation between corporate governance and LBOs is strongly based on the firm's better performance due to the higher level of corporate governance. To control for this relation, the free cash flows must be added to control for the reason of acquisitions driven by free cash flows (Renneboog and Martynova, 2008). Because individual free cash flows are poorly comparable to each other, the free cash flows are scaled by the total assets of the company.

Another control variable that should be added as a proxy for financial distress is leverage. This control variable works oppositely as the free cash flows. For example, a higher level of leverage could be a reason for a PE firm not to target the company with an LBO because it cannot pay off its debts. This makes the investment of the PE firm less profitable, because of the extra amount of leverage that is taken over as well. The same as for the free cash flows, this controls for another reason for acquisition instead of the corporate governance (Renneboog and Martynova, 2008).

For the calculation of both the free cash flow and leverage, the formulas of the paper by Deng et al. (2013) are used. The free cash flows are calculated as operating income before depreciation – interest expenses – income taxes – capital expenditures, scaled by the book value of total assets. And the leverage variable is calculated as the total value of debt/book value of total assets.

Another way of controlling for other effects, which might influence the relation this study wants to determine, is with fixed-effects. To control for variation across industries and the

different years of acquiring, fixed-effects on both levels are added. For the industry fixed-effects, a 3-digit SIC code is used. This enhances the internal validity of the effect between the independent variables and the dependent variables.

3.4 Regression

After collecting data for the governance and control variables and nearest matching the firms, the next step is using this in the regression to find answers to the hypotheses. To determine the expected relation between corporate governance and the likelihood of an LBO, the following regression is used:

$$\text{Model 1: (LBO or nonLBO)} = \beta_0 + \beta_1 * \text{Governance Index} + \beta_2 * \text{Free cash flow} + \beta_3 * \text{Leverage} + \text{Year fixed effects} + \text{Industry fixed effects} + \varepsilon \quad (2)$$

LBO or non-LBO is a dummy variable that is 1 for LBO firms and 0 for non-LBO firms. Because the dependent variable is a dummy, a logit regression must be used. This regression can be used to test hypothesis H1: The level of corporate governance of a company has a positive effect on becoming an LBO target. For this hypothesis, the following holds: $H_0: \beta_1 \leq 0$ versus $H_1: \beta_1 > 0$. A higher level of corporate governance has a positive effect on becoming an LBO target if the β_1 is significantly positive. The expected value of β_1 must be significantly bigger than 0 to be in line with H1.

Regression decomposed model

To take a closer look at which parts of the corporate governance measures are stronger related to being targeted by an LBO, the following decomposed model can be used. This regression can be used to measure the effect of each separate component of the corporate governance index on the likelihood of being targeted by an LBO. This can be useful since it can indicate what to adjust in the corporate governance. It provides a deeper insight into the influence of the different variables of the index.

$$\text{Model 2: (LBO or nonLBO)} = \beta_0 + \beta_1 * \text{Director independence} + \beta_2 * \text{Audit committee independence} + \beta_3 * \text{Board size} + \beta_4 * \text{Institutional ownership} + \beta_5 * \text{Free cash flow} + \beta_6 * \text{Leverage} + \text{Year fixed effects} + \text{Industry fixed effects} + \varepsilon \quad (3)$$

To be in line with the expected relation as described in H2, H3, H4, and H5, the respective β_1 , β_2 , β_3 , and β_4 must be significantly bigger than 0.

3.5 Sample and data

The sample used for this research is restricted to the period from 2010 to 2020. Most of the prior literature on LBOs only researched the LBO transaction from the 1990s until 2007. The reason for this is the 2007 financial crisis, which had its impacts on the market. To make the outcomes of this research as recent as possible, the years 2010 up till 2020 are chosen. The focus of this research is on the characteristics before the company was acquired. For this reason, it does not matter if the firm is acquired in 2020 because there is no information needed after the transaction. In the matching process of LBOs and non-LBOs, the companies are also

matched based on year to enhance the comparability. Another restriction of the sample is the use of only US targets and comparable US non-LBO public firms. The reason for not using multiply countries of targets is made to enhance the comparability. The governance of companies can be related to the country in which they operate, because of regulations introduced by that country. These restrictions are most appropriate for comparing the firms, which is useful for a reliable answer to the research question.

The information about the LBO transactions in the US between 2010 and 2020 can be obtained from SDC Platinum, accessed via ThomsonOne. Selecting the acquisition technique leveraged buyouts results in a list of 323 firms with various information of which enterprise value, year of the transaction, and the ticker symbol are important for constructing the dataset (see appendix I). For this study, only LBO transactions in which 100% of the shares are acquired are considered.

Warton Research Data Services is used to obtain the corporate governance variables that are used for the index. BoardEx is accessed via WRDS to provide information on the number of directors on board, audit committee independence, and director independence. Thomson Reuters Institutional (13f) Holdings is also accessed via WRDS to provide the institutional ownership of the companies before they went private. The governance-related data is not available for all these firms, which causes that the sample gets reduced to 130 firms. Compustat, accessed via WRDS, provides a list of all US public firms between 2010 and 2020, which stayed public (see appendix I).

This list is nearest matched with firms that went private through an LBO, based on year, industry, and enterprise value. The use of these variables for matching is inspired by Cao et al. (2019), who uses the same variables. For matching, the enterprise value of the non-LBO firms must be calculated in the same way as ThomsonOne provided the enterprise values of the LBO firms. Based on the variable description of ThomsonOne, the following calculation is used: Enterprise value = market capitalization at fiscal year-end + preferred stock + minority interest + total debt – cash. With their variable definition, ThomsonOne also specified their source to be Compustat for the components used. Using the same variables as ThomsonOne used for the calculation, the enterprise value of the non-LBO firms is calculated (see appendix I). The firms are also matched based on industry. This is done by using the 3-digit SIC codes, which are obtained from ThomsonOne as well as from BoardEx.

The values of the control variables are obtained using Datastream. This source is also used by Martynova and Renneboog (2008) to collect the accounting info they needed. Datastream can be accessed with the help of the Erasmus Data Service Centre. Free cash flows, total debt, and total assets are pulled from this database. The assets are used to divide the debt to get to the leverage. The free cash flows are also divided by the company's assets to enhance the comparability between the firms. Because of data availability, this results in a smaller sample of 91 LBO firms, which are matched with 91 non-LBO firms (see appendix I). Also, see appendix II for the variable definitions and calculations if applicable.

Looking at the paper of Cao et al. (2019), the sample size is as expected. Their sample of 844 LBOs worldwide between 1995 and 2007 seems in line with 323 only US LBOs in 10 years. Because of this small sample size, the economic relevance of the research can be questioned. However, the 323 LBO transactions between 2010 and 2020 in the US only have a total transaction value of over 424 billion dollars. If the results are significant for the final sample of 91 LBO transactions, the results can be projected on the overall sample of LBO transactions. This shows the economic importance of the potential outcomes of this research.

Descriptive Statistics

Table 1 shows the descriptive statistics of the variables that are used for the research. The variables are sorted based on the type of variable. The descriptive statistics are presented for the total sample of 182 observations. Starting with the dummy variable (LBO or non-LBO), as the dependent variable. The descriptive statistics are not surprising, since half of the observations are LBO and given 1 point. The other half is non-LBO and gets 0 points. This results in a mean of 0,5, a minimum value of 0, and a maximum value of 1.

The independent variables are more interesting since they do have other values than 0 or 1. The total index variable has a mean of 2.655, with the lowest index of 0.899 and the largest index of 3.357. These last two numbers represent the lowest and highest governance level scores, respectively. What points out is that the relative difference between the scores is quite large. The director independence variable has a mean of 0.716 and a min of 0, and a max of 1. This 0 means that there are no independent directors on the board of directors in some cases. The opposite works for the 1, which indicates that their board of directors consists entirely of independent directors. The audit committee independence variable has a mean of 0.940, with 0 as minimum and 1 as maximum. This shows that by far the largest part of firms in the sample has an independent director on the audit committee. Board size scores relatively low based on the mean of 0.380, compared to the other independent variables. Looking at the max value, some companies do score high on this variable, but the 75% shows that the largest part is below the 0.436. The striking thing about the institutional ownership variable is the maximum value of 1. This indicates that there is at least one company that is owned for 100% by institutional owners.

The control variables show larger differences between the minimum and maximum values. Starting with the free cash flow, with a minimum value of -6.701. The free cash flows are divided by the total assets, indicating that this company has a large negative free cash flow with a smaller (positive) book value of total assets. On the other hand, there is a company with almost as much free cash flow as their value of total assets with a score of 0.931. The leverage variable shows there are companies with no leverage at all. And there are companies with a debt that is more than 11 times bigger than their assets.

Table 1: Descriptive statistics of identified variables

This table shows the descriptive statistics of the variables used for this research. In the first column, the names of the variables are identified. In the following columns, the numbers of observations, mean, standard deviation, minimum values, maximum values, and the 25th, 50th, and 75th percentiles are presented. The enterprise values are in millions of \$. The descriptive statistics are obtained from 182 observations.

Variable	Obs.	Mean	Std. Dev.	Min	Max	25%	50%	75%
<i><u>Dependent</u></i>								
LBO or Not	182	0.5	0.501	0	1	-	-	-
<i><u>Independent</u></i>								
Index	182	2.655	0.459	0.899	3.357	2.371	2.773	3.007
Director independence	182	0.716	0.138	0	1	0.625	0.714	0.830
Audit Committee Independence	182	0.940	0.239	0	1	-	-	-
Board Size	182	0.380	0.102	0.146	0.784	0.319	0.368	0.436
Institutional ownership	182	0.619	0.309	0	1	0.417	0.711	0.870
<i><u>Control</u></i>								
Free cash flow	182	0.041	0.538	-6.701	0.931	0.049	0.086	0.137
Leverage	182	0.231	0.888	0	11.27	0.000	0.000	0.227
<i><u>Firm statistics</u></i>								
Enterprise Value	182	2303	3804	12	32420	389	966	2656

The enterprise value is used to match the firms based on size. The mean shows that the average company has an enterprise value of over 2.3 billion dollars. The difference between the minimum (12 million) and maximum (32.4 billion) is huge. Both values can be seen as outliers of the sample. However, correcting for these outliers is unnecessary because every outlier has a match. Because every “outlier” has a match, they are not really outliers and still useful for the research. This shows why it is crucial to match the firms based on size to be able to make a good comparison.

Table 2 is based on the LBO firms in the sample only, so not the complete list of LBO transactions between 2010 and 2020. The first thing that is important to see is that the total deal value of these 91 transactions is almost 186 billion dollars. As earlier mentioned, the total deal value of all the 323 transactions is just over 424 billion dollars. The number of transactions in the sample only represents 28% of 323 transactions. However, the deal value covered by the sample is almost 43%. This indicates that larger firms are more likely in the sample, resulting from their governance information being available. The percentages and cumulative percentages are useful to keep in mind during the research.

Table 3 shows the descriptive statistics of the total population of US public firms that are not taken private, of which the governance variable information was available. The dependent variable is logically 0 because there are no LBO firms in this set. The mean governance index gets a bit higher compared to the matched sample information, displayed in table 1. Also, the minimum value increases, meaning that in table 1 the minimum value belongs to an LBO firm. The separate components of the governance index have similar values for the population as for the matched sample. The board size value has a broader range between minimum and maximum values for the population statistics.

Table 2: Sample distribution by year and cumulative deal value

This table presents the LBO transactions between 2010 and 2020, sorted by year for the sample of 91 LBO transactions. It shows the cumulative percentages of the number of transactions relative to the sample. The same holds for the deal values, which are presented in millions of dollars.

Year	Freq.	Percentage	Cumulative	Deal Value (\$M)	Percentage	Cumulative
2010	2	2.20%	2.20%	5026	2.70%	2.70%
2011	15	16.48%	18.68%	18221	9.80%	12.50%
2012	12	13.19%	31.87%	10497	5.65%	18.15%
2013	9	9.89%	41.76%	42104	22.64%	40.79%
2014	10	10.99%	52.75%	12383	6.66%	47.45%
2015	12	13.19%	65.93%	31154	16.75%	64.20%
2016	9	9.89%	75.82%	18729	10.07%	74.28%
2017	8	8.79%	84.62%	16233	8.73%	83.01%
2018	5	5.49%	90.11%	6605	3.55%	86.56%
2019	3	3.30%	93.41%	12430	6.68%	93.24%
2020	6	6.59%	100%	12561	6.76%	100%
Total	91	100.00%		185943	100%	

Table 3: Descriptive statistics of identified variables

This table shows the descriptive statistics of 605 public firms of the population of US firms between 2010 and 2020, of which the data was available. In the first column, the names of the variables are identified. Then, in the following columns, the numbers of observations, mean, standard deviation, minimum values, maximum values, and the 25th, 50th, and 75th percentiles are presented. The enterprise values are in millions of \$. The descriptive statistics are obtained from 182 observations.

Variable	Obs.	Mean	Std. Dev.	Min	Max	25%	50%	75%
<u>Dependent</u>								
LBO or Not	605	0	0	0	0	-	-	-
<u>Independent</u>								
Index	605	2.678	0.441	1.176	3.567	2.315	2.818	3.043
Director independence	605	0.720	0.125	0.250	1	0.667	0.714	0.800
Audit Committee Independence	605	0.981	0.134	0	1	-	-	-
Board Size	605	0.366	0.111	0.107	0.926	0.290	0.362	0.431
Institutional ownership	605	0.611	0.314	0	1	0.342	0.703	0.883
<u>Control</u>								
Free cash flow	605	-0.016	1.156	-27.182	1.645	0.021	0.081	0.142
Leverage	605	0.200	0.275	0	3.024	0.000	0.106	0.314
<u>Firm statistics</u>								
Enterprise Value	605	6653	24570	5	282424	155	819	3297

The interesting part about the control variables is that free cash flows have a negative mean value, likely caused by the large minimum value included in this data set. For the leverage variable, the striking thing is that the maximum value in the population is 3.024, while in the matched sample the largest value for leverage is 11.277. This 11.277 must be the leverage belonging to an LBO, which is not what was expected initially. Lastly, the enterprise values becomes much larger in the population. The mean value is almost three times bigger for the population than for the matched sample. Also, the maximum value of 282423 pushes up the mean since 32420 is the maximum value for the matched sample.

4. Results

This section shows the results of the research explained in chapter 3. The results are translated into answers regarding the hypotheses. Furthermore, some outcomes are not related to the hypotheses but are still interesting for this research.

4.1 Index regression results

Table 4 shows the logit regression results as explained in section 3.4. Model 1 answers H1. The matched sample is used for this model of 91 LBO firms and 91 non-LBO firms, with dummy variable values 1 and 0, respectively. The coefficient of the created index concerning the dummy variable of an LBO or non-LBO has a value of 0.028. For the first hypothesis, a significantly bigger value from zero was expected for the index variable coefficient. Instead, the results show an insignificant value, indicating that the governance index of LBO firms is not significantly different from the index of non-LBO firms. However, the direction of the coefficient is in the expected direction according to the first hypothesis. The 0.028 indicates that a higher governance index increases the likelihood of being an LBO target if a significant relation is found. Because of this insignificant outcome, H1 is rejected. This insignificant value might be caused by the sample size being very small compared to general regression samples.

The control variables show interesting results compared to the prior literature. The interesting part about the control variable free cash flows is that the coefficient of this variable is negative and insignificant. This negative coefficient indicates that higher free cash flows decrease the likelihood of being an LBO target. Moreover, the z-statistic suggests that there is an insignificant relation meaning that free cash flows are not related to being an LBO target or not. This is the opposite of what was seen in prior literature, which mostly pointed towards the usefulness of free cash flows for PE firms for paying off their debt. The value of the coefficient for the control variable leverage is as expected. A higher level of leverage causes a decrease in the likelihood of being an LBO target. The leverage variable has a coefficient of -7.237, which is highly significant at a 0,1% level.

4.2 Decomposed model results

The built index shows no significant relation with being an LBO target or not. As explained in section 3.1.2, the governance index is constructed of 4 variables. These variables are put in a logit regression to see their separate effect on the dependent variable. Splitting up the index into separate variables can explain which factors are causing the insignificant effect of the index. The results of these separate variables are shown in model 2 in table 4. As can be seen, the same matched sample of in total 182 observations is used for this regression. The control variable outcomes are somewhat the same in the second model as in the first model.

In contrast to the first model, the second model shows a significant relation between an independent and dependent variable. The director independence variable establishes the significant relation. The results show a coefficient of 3.744 for this variable, which is significant at a 5% level. Considering that LBO firms get 1 instead of 0 in the dependent variable, a higher level of director independence causes the likelihood of being an LBO target

Table 4: Logit regression results

This table presents the results of the logit regressions as explained in section 3.4. The dependent variable is the dummy variable which is 1 for LBO firms and 0 for non-LBO firms. The independent variables are the corporate governance index and every component of the index. The control variables are Free Cash Flow and Leverage. Furthermore, the year and industry fixed-effects are included, based on the 3-digit SIC code. Z-statistics are denoted in parentheses *, **, ***, **** represent the statistical significance of 10%, 5%, 1% and 0,1%, respectively. On the bottom of the table, the Chi-square of the model and the P-value can be found.

	(1)	(2)	(3)	(4)
<u>Dependent var:</u>	LBO or non-LBO	LBO or non-LBO	LBO or non-LBO	LBO or non-LBO
<u>Independent var:</u>				
Index	0.028 (0.005)		-0.351 (0.582)	
Director Independence		3.744 (1.980)**		1.142 (0.562)
Audit Committee Independence		0.512 (0.453)		-0.494 (-0.298)
Board Size		-3.713 (-1.305)		3.100 (1.207)
Institutional Ownership		-0.655 (-0.774)		-1.347 (-1.385)
<u>Control var:</u>				
Free Cash Flow	-0.431 (-0.243)	-0.395 (-0.218)	1.634 (1.095)	1.216 (0.792)
Leverage	-7.237 (-4.543)****	-7.471 (-4.370)****	-4.442 (-2.619)***	-4.510 (-2.675)***
<u>Fixed effect:</u>				
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Observations	182	182	696	696
Chi-Square	85.408	90.996	403.057	405.478
P-value	0.117	0.087	0.000	0.000

to increase. In other words, firms that are taken over through an LBO have a higher level of director independence before they were taken over than comparable non-LBO firms. This variable points in the direction as was expected and described by H2, so H2 is accepted. This means that including this variable in the governance index is not the reason why there is no significant difference between the governance indices of LBO and non-LBO firms.

Audit committee independence has an insignificant value, indicating there is no relation with the dependent variable. The positive coefficient value does not imply anything about the direction of the effect because of the insignificance. Based on this result, the independence of the audit committee of firms has no influence on the decision of PE firms in determining their target. Based on this result, H3 is rejected. Another insignificant independent variable of the governance index is institutional ownership. The coefficient of this variable, related to the dependent variable, is -0.655 but is insignificant. Leaving the insignificance aside, the direction of this independent variable is not as expected. H5 is rejected because no significant positive relation is found between the level of institutional ownership and becoming an LBO target.

Another independent variable, which is likely to be a reason why the index variable is not significant is the board size variable. The board size variable is insignificant but the closest to significance compared to the other insignificant independent variables. Prior literature implicated that smaller boards are more effective and thus better for corporate governance. However, the board size variable has a coefficient of -3.713, indicating a negative relation between board size and the likelihood of being an LBO target if significance was found. This means that if this independent variable increases, the dependent variable decreases. A higher level of the board size variable comes from a smaller difference between the log(enterprise value) and board size. So when the number of directors on board gets smaller relative to the log(enterprise value), the variable increases. In practice, this means that smaller boards are considered to influence the chance of being an LBO target negatively. However, this variable shows an insignificant result, which is why H4 is rejected.

4.3 Unmatched regression

For the unmatched regression, the total population of public US firms between 2010 and 2020 is used, of which the governance variable information was available. These 605 firms are regressed, together with the 91 LBO firms, to see whether not matching the firms shows different results.

Starting with column 3 of table 4, logit regression model 1 is used with another set of observations. Still, no significant relation is found between the governance index and the dependent variable. Based on the z-statistics, the significance improved compared to column 1. The coefficient of the index variable is negative in column 3, indicating that, if a significant relation was found, a higher level of corporate governance would have decreased the likelihood of being an LBO target. Due to the insignificance of this variable, H1 is rejected with the unmatched regression as well. The direction of the leverage control variable is the same as in the previous models and significant at a 1% level. The free cash flow control variable is still insignificant but has a positive coefficient in column 3.

The decomposed model results of the unmatched logit regression are presented in column 4. Every single component of the constructed governance index is insignificant, indicating there is no relation between the corporate governance variables and the likelihood of becoming an LBO target. Even the director independence variable, which was significant at a 5% level in the matched sample, is no longer significant. Based on these results, H2, H3, H4, and H5 are rejected. The level of these corporate governance variables has no positive effect on becoming an LBO target.

4.4 Robustness test

An error came up for the explained logit regression when including the leverage control variable in the model. The error indicated that the model predicts absolute probabilities of 0 and 1. This error does not have to be an issue because the used function to apply this regression is almost always robust enough to handle these problems itself. Also, for the used dataset, predicted probabilities of 0 and 1 for the leverage control variable are logical. Almost every

Table 5: OLS regression results

This table presents the results of the OLS regression of the regression formula explained in section 3.4. The dependent variable is the dummy variable which is 1 for LBO firms and 0 for non-LBO firms. The independent variables are the corporate governance index and every component of the index. The control variables are Free Cash Flow and Leverage. Furthermore, the year and industry fixed-effects are included, based on the 3-digit SIC code. T-statistics are denoted in parentheses *, **, ***, **** represent the statistical significance of 10%, 5%, 1% and 0,1%, respectively.

	(1)	(2)	(3)	(4)
<i>Dependent var:</i>	LBO or non-LBO	LBO or non-LBO	LBO or non-LBO	LBO or non-LBO
<i>Independent var:</i>				
Index	0.029 (0.234)		0.002 (0.085)	
Director Independence		0.651 (1.757)*		0.060 (0.766)
Audit Committee Independence		0.055 (0.229)		-0.087 (-1.398)
Board Size		-0.994 (-1.732)*		0.161 (1.694)*
Institutional Ownership		-0.022 (-0.120)		-0.028 (-0.838)
<i>Control var:</i>				
Free Cash Flow	-0.457 (-2.022)**	-0.411 (-1.832)*	0.002 (0.245)	0.000 (0.002)
Leverage	-0.350 (-2.712)***	-0.352 (-2.760)***	-0.127 (-3.304)***	-0.127 (-3.281)***
<i>Fixed effect:</i>				
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Observations	182	182	696	696
R-squared	0.243	0.283	0.597	0.601

LBO firm has 0 leverage, in contrast to nearly all non-LBO firms who do have leverage. Another cause for this error is the use of a small sample, which is the case in this study. However, to be sure that it is not a problem in this case, a robustness test is done. In this robustness test, the same regression (models 1 & 2) as formulated in section 3.4 is applied to the data. However, this time, instead of using a logit regression, an OLS regression is applied. Applying an OLS regression on a binary dependent variable is called a linear probability model.

Table 5 shows the results of the OLS regression. Looking at model 1, the results are the same for the index variable. Different from the logit regression is the significant relation found for the control variable free cash flow. More interesting are the results in column 2. The decomposed model shows a significant relation for the board size variable, which was not found with the logit regression. However, the coefficient of this variable is still negative, indicating that larger boards are better for corporate governance. This was not the expected direction of the relation as described in H4, so although the significance is found, H4 is still rejected.

The unmatched OLS regression shows no significant relation between the governance index and the dependent variable. Furthermore, there is no longer a significant relation found with the free cash flow control variable. The decomposed unmatched OLS regression shows a significant positive relation with the board size. The coefficient of 0.161 is significant at a 10% level. This relation is as expected based on the prior literature, suggesting that smaller boards are more effective and thus better for corporate governance. Based on this result, H4 would be accepted. However, this is not the primary research design used by this study, so the meaning of this accepted hypothesis is less important.

The results of the robustness test draw no other implication for answering the hypotheses. The governance index values in columns 1 and 3 are still insignificant. This means that the corporate governance of a firm is not a determinant of a PE firm in determining its LBO target. The OLS regression showed with the decomposed model some expected results, but these were not seen from the logit regression. However, these results are not conclusive enough to accept the formulated hypotheses.

5. Conclusion

This section is used to finalize the outcomes of the research. This is done by indicating the implications of the results and their contribution to the prior literature. Furthermore, the limitations and possibilities for future research are explained.

5.1 Results summary

The results of this research are not as expected, as can be seen in section 4. The hypotheses that were formulated and reasoned based on evidence from prior literature are not satisfied. The first hypothesis is H1: The level of corporate governance of a company has a positive effect on becoming an LBO target. This expected relation was researched by regressing the governance index with the dummy variable LBO or non-LBO. There is no significant relation found between the governance indices and the dependent variable. This means that the level of corporate governance of a firm is not a determinant for PE firms in determining their target for an LBO transaction. Finally, the research question is: Are companies with a higher level of corporate governance more likely to be LBO targets? Based on the overall governance index, the answer is that there is no significant difference between the level of corporate governance of LBO firms compared to non-LBO firms. This means that it can't be said that good or bad governed firms are more likely to be an LBO target. So, companies with a higher level of corporate governance are not more likely to be LBO targets. However, one separate variable does give some insights into a characteristic of LBO targets. A higher level of director independence of a company has a positive effect on becoming an LBO target. This result causes the acceptance of the H2.

5.2 Contribution to prior literature

As shown in section 2.3, the overall evidence from prior literature on LBOs is based on financial characteristics. Especially, the free cash flows are an important determination and factor of LBOs. Higher free cash flows are attractive for PE firms because of their usefulness in paying off the created debt. In contrast to this prior literature, this study finds a negative and insignificant result of the free cash flows on becoming an LBO target in the main regression. Furthermore, the regression of the robustness test shows a significant negative relation between the height of the free cash flows and the likelihood of being an LBO target. So, according to this research, there is no positive relation between the firm performance and the likelihood of being an LBO target. One clear thing is that leverage is negatively related to LBOs. From this, the conclusion can be drawn that LBO targets should at least be healthy based on their debts.

This is likely to be the reason why the chosen governance characteristics, which should be positively related to performance, are also not the reason for targeting a firm with an LBO transaction. On the other side, it can also be said that these results question the prior literature whether the explained governance characteristics are considered positive for firm performance. Apart from director independence, no variables relate to the choice of a PE firm in determining its target. Although insignificant, some variables showed a negative relation with being an LBO target.

An implication of the outcomes for public firms is that the proportion of independent directors on the board influences their chance of being targeted with an LBO. Indicating the importance of independent directors on the reliability of a firm. The results also show PE firms, which factor is used by other competitors to determine their target. Another implication is regarding the importance of corporate governance for outside investors like PE firms. Governance characteristics are not important for these investors, likely because these are aspects of a firm that can be changed. A side note of this implication is that the power of the investor needs to be large enough to change such aspects.

5.3 Alternative explanation

An explanation for not finding a relation between the corporate governance variables and LBOs is that a PE firm becomes the owner of an LBO firm. Buying and thus owning all the shares of a company gives the PE firm the power to run the company. This might be a reason why the governance characteristics together are no determining factor in deciding to acquire the company. Governance characteristics can be adjusted after acquiring the company. But still, the level of director independence is related to becoming an LBO target. Also, some variables show interesting directions towards the dependent variables but are insignificant. This insignificance can be due to the small sample size of this research, which is caused by the poor availability of governance data.

5.4 Limitations and future research

Limitations of the research are mostly regarding the sample size. The governance characteristics of most companies are not available on the available databases. This makes it challenging to construct a large sample, which affects the outcomes of the research. This was still the case when looking at the overall population instead of only the matched sample firms. Another limitation of the wide variety of governance characteristics relates to the first limitation. There are many governance characteristics, which influence a variety of aspects inside and outside the firm. Because adding more governance characteristics to the sample resulted in a smaller sample, not all possible governance characteristics are used. The used characteristics should have had their positive influences on the performance, which is why they were chosen for the index. However, this leaves some room for further research. In further research, another composition of governance characteristics can be used for the index. For example, governance characteristics that function as shareholder protection mechanisms.

Appendices

Appendix I: Data retrieval steps & consulted databases

This table represents the databases and variables used from these databases to get to the sample that is used for the research. In the first column, you see the consulted databases and the used data. In the second column, the applied filters are represented. In the third column, the amount of hits is seen because of the filters used.

Request	Description	Hits
<i>Thomson One:</i>		
Database	All Mergers & Acquisitions	n/a
Target nation (code)	United States of America	377.149
Target Public Status (Code)	Public	67.043
Deal type (Code)	Leveraged Buyouts	1.923
Acquisition Technique (Code)	Leveraged Buyouts	1.923
Deal Status (Code)	Completed	1.245
Date Effective	01/01/2010 to 31/12/2020	323
<i>WRDS BoardEx database:</i>		
Board size	Number of Directors on Board	263
Committees	Committee Name	234
Director independence	Individual Role	234
<i>WRDS Thomson Reuters Institutional (13F) holdings</i>		
Institutional Ownership	Institutional Ownership	130
<i>Datastream:</i>		
Required financials	Free Cash Flows	91
	Total Debt	91
	Total Assets	91
Final sample		182 (91*2)
<i>WRDS Compustat:</i>		
Public companies US	List of public US companies between 2010 and 2020	16.246
	Individual firms (removed duplicates)	2.820
<i>WRDS BoardEx database:</i>		
Board size	Number of Directors on Board	1.692
Director independence	Individual Role	1.691
Committees	Committee Name	732
<i>WRDS Thomson Reuters Institutional (13F) holdings</i>		
Institutional Ownership	Institutional Ownership	667
Removing LBOs	non-LBOs on the list	643
<i>Datastream:</i>		
Required financials	Total Assets	612
	Total Debt	607
	Free Cash Flows	605
Final population		605

Appendix II: Overview of variable definitions & calculations

This table presents the variable definitions and, if applicable, the calculations. The first column shows the names of the variables as presented in the index and regressions. In the second column, the definitions and/or calculations are presented. The variables are divided into dependent variables, independent variables, control variables, and extra calculations.

Variable name	Definition / Calculation
<i>Dependent variables:</i>	
LBO or non-LBO	This is a dummy variable. This variable is 1 for firms acquired through an LBO and 0 for firms that stayed public.
<i>Independent variables:</i>	
Director independence	This variable is used for the index. The following calculation measures the relative power of the independent directors: Number of independent directors present / Number of directors on board.
Audit Committee Independence	This variable is used for the index and gets 1 if all the directors on the audit committee are independent and 0 if there are one or more dependent directors.
Board Size	This variable is used for the index. This variable is calculated as: $\log(\text{enterprise value}) / \text{Number of directors on board}$
Institutional Ownership	This variable is used for the index. This variable is calculated as the total number of shares held by institutional owners / total number of shares outstanding
<i>Control variables:</i>	
Free cash flow	$(\text{Operating income before depreciation} - \text{interest expense} - \text{income taxes} - \text{CAPEX}) / \text{Total Assets}$
Leverage	$\text{Total Debt} / \text{Total Assets}$
<i>Extra calculations:</i>	
Enterprise value	= market capitalization at fiscal year-end + preferred stock + minority interest + total debt – cash.
ε	Error term

Appendix III: Pearson correlation matrix included variables

This table presents the Pearson correlation matrix, based on the sample of 182 firms, relevant for Hypothesis 1, 2, 3, 4 & 5. Keeping the correlation threshold at 0.70, all the correlations are below this threshold.

Variables	LBO Non-LBO	Director independence	Audit committee independence	Board size	Institutional ownership
LBO or non-LBO	1.000				
Director independence	0.174	1.000			
Audit committee independence	0.023	0.010	1.000		
Board size	0.127	0.016	0.085	1.000	
Institutional ownership	0.051	0.057	0.041	0.184	1.000

References

- Acharya, V.V., Hahn, M., Kehoe, C., (2009). Corporate governance and value creation: evidence from private equity. *Centre for economic policy research*
- Andres, C. Betzer, A. Weir, A. (2007). Shareholder wealth gains through better corporate governance – The case of European LBO-transactions. *Financial Markets and Portfolio Management*, 21, 403-424
- Bharath, S. and Dittman, A. (2010). Why do firms use private equity to opt out of public markets? *The review of Financial Studies*, 23(5), 1771-1818
- Brown, L. and Caylor, M. (2006). Corporate governance and firm valuation. *Journal of Accounting and Public Policy*, 25(4), 409-434
- Cao, X. Cumming, D. Goh, J. Wang, X. (2019). The impact of investor protection law on global takeovers: LBO vs. non-LBO transactions. *Journal of International Financial Markets, Institutions & Money*, 59, 1-18
- Ceo, X. Cumming, D. Goh, J. Wang, X. (2019). The impact of investor protection law on global takeovers: LBO vs. non-LBO transactions. *Journal of International Financial Markets, Institutions & Money*, 59, 1-18
- Cornelli, F. and Karakas, O. (2008). Private Equity and Corporate Governance: Do LBOs Have More Effective Boards?
- Deng, X. Kang, J. & Low, B.S. (2013). Corporate social responsibility and stakeholder value maximization: Evidence from mergers. *Journal of financial economics*, 110(1), 87-109
- Dey, A. (2008). Corporate governance and agency conflicts. *Journal of Accounting Research*, 46(5), 1143-1181
- Gibbs, PA. (1993). Determinants of corporate restructuring: The relative importance of corporate governance, takeover threat, and free cash flow. *Strategic Management Journal*, 14, 51-68
- Gompers, P. Ishii, J. Metrick, A. (2003). Corporate governance and equity prices, *The Quarterly Journal of Economics*, 118(1), 107-155
- Guest, P.M. (2009). The impact of Board Size on Firm Performance: Evidence from the UK. *European Journal of Finance*, 15(4), 385-404
- Holstrom, B., Kaplan, S.N. (2001). Corporate governance and merger activity in the United States: Making sense of the 1980s and 1990s. *Journal of Economic Perspectives*, 4(2), 121-144
- Jensen, M.C. (1986). Agency costs of free cash flow, corporate finance, and takeovers. *The American economic review*, 76(2), 323-329
- Kalnins, A. (2018) Multicollinearity: How common factors cause Type 1 errors in multivariate regression *Strategic Management Journal*, 39 (8), 2362-2385
- Kaplan, S.N. and Stromberg, P. (2009) Leveraged buyouts and private equity. *Journal of economic perspectives*, 23(1), 121-146
- Larcker, D.F. Richardson, S.A. Tuna, I. (2007). Corporate governance, Accounting Outcomes, and Organizational Performance, *The accounting review*, 82(4), 963-1008
- Lin, D. and Lin, L. (2016). How does Corporate Governance Affect Free Cash Flow?. *Journal of Applied Finance & Banking*, 6(1), 145-156

- Martynova, M. & Renneboog, L. (2008). Spillover of corporate governance standards in cross-border mergers and acquisitions. *Journal of Corporate Finance*, 14(3), 200- 223
- Mehran, H. and Peristiani, S. (2010). Financial visibility and the decision to go private. *The Review of Financial Studies*, 23(2), 519-547.
- Nikoskelainen, E. and Wright, M. (2007). The impact of corporate governance mechanisms on value increase in leveraged buyouts. *Journal of Corporate Finance*, 13(4), 511-537
- Scigliuzzo, D., Lee, L., & Seligson, P. (2020, November 24). *Buyout Titans Fire Up LBO Machine With \$1.6 Trillion to Spend*. Bloomberg. <https://www.bloomberg.com/news/articles/2020-11-24/buyout-titans-fire-up-lbo-machine-with-1-6-trillion-to-spend>