

Public-to-Private Leveraged Buyouts: A Study on Premiums in the Nordics

Carl Ekenhammar (25706) & Leonard Chun (25690)

Abstract

Public-to-private leveraged buyouts are often associated with acquisition premiums, leading to significant wealth gains for the pre-buyout shareholders. This thesis investigates the determinants of these premiums in the context of Nordic countries between 2000 and 2023, with a focus on understanding which firm-specific and transaction characteristics can explain the premiums paid. Using a sample of 62 PTP transactions, we apply a cross-sectional linear regression analysis grounded in established hypotheses from previous literature. Our findings provide robust evidence for the undervaluation, free cash flow, and bidder competition hypotheses as key drivers of acquisition premiums. Conversely, the tax benefit and blockholder hypotheses yield statistically insignificant results, likely reflecting regional differences in corporate governance structures and the impact of OECD regulatory constraints on interest deductibility. The results also highlight a trend of lower premiums in the Nordics compared to historical studies in the U.S. and U.K., suggesting enhanced market sophistication. These findings align with previous studies while emphasizing the importance of regional and contextual factors in understanding acquisition premiums. The study contributes to the limited body of research on Nordic PTP LBOs and highlights opportunities for further exploration into the effects of these transactions.

Supervisor: Katarina Hellström

Keywords: Public-to-private, leveraged buyouts, Nordic markets, acquisition premiums.

Acknowledgements: We would like to thank Katarina Hellström for great support and feedback.

1. Introduction	3
2. Literature review and hypotheses.....	5
2.1. Pre-buyout shareholder wealth gains	5
2.2. Theory and hypotheses.....	6
2.2.1. Tax benefit theory	6
2.2.2. Blockholder theory.....	7
2.2.3. Free cash flow theory	9
2.2.4. Undervaluation theory.....	10
2.2.5. Bidder competition theory	11
2.2.6. Additional theories.....	12
3. Methodology	13
3.1. Premium analysis.....	14
3.2. Cross-sectional scope.....	14
3.3. Data collection.....	15
3.4. Dependent variable.....	17
3.5. Independent variables	18
3.6. Control variables	21
3.7. Outliers	22
3.8. Model	23
4. Results	23
4.1. Descriptive Statistics.....	23
4.2. Analysis of results	26
4.2.1. Hypotheses testing	28
4.2.2. Additional Findings	29
4.3. Robustness checks.....	29
4.3.1. Diagnostic checks for regression validity	29
4.3.2. Winsorization and dependent variable definition	30
4.4. Nonlinearity findings.....	31
5. Discussion.....	32
5.1. Limitations	35
6. Conclusion.....	36
6.1. Suggestions for future research.....	37
References	39
Appendix	43

1. Introduction

It is often believed that publicly listed corporations have significant advantages versus private corporations. Apart from the status and recognition gained on a personal level, the public corporation may enjoy access to capital from equity markets as well as enhanced brand visibility, among many other benefits. On the other hand, publicly listed corporations are required to disclose regulatory compliance and financial reporting. Further, a larger distribution of owners may result in an insufficient monitoring of the company's decisions, negatively affecting shareholder value. An approach which may redirect the management's efforts toward enhancing shareholder value is the public-to-private (PTP) transaction. In this type of transaction, a public company is acquired by a non-strategic buyer (often a private equity firm) and then subsequently removed from the stock market. As almost all such transactions are financed by debt to a larger extent than industry average, this type of transaction falls under the umbrella term of the deal technique known as a leveraged buyout (LBO) (Renneboog and Vanseenkiste, 2017). There are private-to-private LBOs, however, this paper will focus solely on public-to-private LBOs, therefore we will use the terms LBO and PTP synonymously.

The concept of public-to-private leveraged buyouts has been a defining feature of corporate finance since its promotion by "Wall Street" in the 1970s and then its rise to prominence in the 1980s. The latter of the decades saw the emergence of figures like Jerome Kohlberg, Henry Kravis, and George Roberts (co-founders of KKR) whose names became synonymous with some of the largest and most aggressive LBO deals in history (Kaplan, 1997). In the 10 years starting from 1979 and ending in 1989, the market capitalization of public-to-private deals in the US was worth north of 250 billion USD (Opler and Titman, 1993). It seems evident that Wall Street's directors and investors saw private corporations as an advantageous alternative to its public counterparts. The rise of the PTP deals was to the extent such that researchers hypothesised the fall of the public corporation arguing for the advantages of the private corporation, as may most notably be seen from Jensen's influential 1989 article titled "Eclipse of the public corporation" (Jensen, 1989).

The early years of the new millennium also experienced a wave of PTP transactions exceeding the 1980s in value, primarily in the US and UK, incited by the inexpensive debt in the collateralized debt obligation (CDO) markets. The trend waned when the CDO market

collapsed in 2007, playing a central role in the 2007-2009 financial crisis (Renneboog and Vanseenkiste, 2017). The substantial value of PTP transactions coupled with the 2007–2009 financial crisis has drawn heightened attention to the role of leveraged practices.

Although the private equity industry makes more decisions regarding capital structure than almost any other industry, researchers argue that information about what drives these decisions is in short supply (Axelson et al., 2013). It has also been argued that previous LBO research is limited in its scope as the large majority of the research focuses singularly on the US and on the 1980s (Renneboog and Vanseenkiste, 2017). There have been a few studies with a focus on non-American regions within this field, Strömberg and Kaplan (2009) using a global sample, Boucly et al. (2011) for France, Bergström et al. (2007) for Sweden are a few examples. However, research for PTP transactions outside the US are still deemed limited (Renneboog and Vanseenkiste, 2017).

The lack of research in regions other than the US is problematic since the findings stemming from US LBO research is unable to be applied extensively into a European context. There is simply a large difference between the debt financing of US LBO transactions and European transactions (Toms and Wright, 2005). The financing of the American LBO transactions of the 1980s which most of the research has been covering were predominantly made up of junk bonds. The predominant financing method in the European and UK LBO transactions were and still are business loans that offer repayment terms adapted to a company's cash flows, known as mezzanine financing (Renneboog and Vanseenkiste, 2017). The differing characteristics in these sources of funds includes interest rates, maturity, and flexibility are said to likely have an impact on the reward system of the transaction. These factors make it problematic to extrapolate the learnings into a European context.

Therefore, we believe that there is a gap in the PTP LBO research both in the time scope as most of the literature is focused on the 1980s but especially in the geographical scope, as the majority of literature has been done within the US. We then have the formulation of our research question:

“What factors explain the acquisition premium in public-to-private leveraged buyouts?”

We conduct our study with the regional scope of the Nordic countries Sweden, Norway, Finland, and Denmark from the beginning of the year 2000 to the end of 2023. We believe this paper has the opportunity to contribute to minimizing the research gap by examining companies from the 2000s onwards and geographically focusing on the Nordic region within this time frame.

The various hypotheses regarding this topic are summarised in the literature review. This paper examines the research question by analyzing financial information prior to the buyout (ex ante) through a premium analysis of 62 firms. We build our methodology upon Renneboog et al. (2007), using an ordinary least squares regression to cross-sectionally analyse the impact of the variables. Our findings provide significant support for the undervaluation, free cash flow, and bidder competition hypotheses.

The paper proceeds as follows: we outline the literature and formulate our hypotheses in section 2. Then, we explain our methodology in section 3 and move on to our results in section 4. The results are discussed in section 5. Our conclusions are drawn in section 6, where we also present our suggestions for future research.

2. Literature review and hypotheses

2.1. Pre-buyout shareholder wealth gains

When a publicly traded company is taken private, the acquirer typically offers a price per share higher than the market price at the time of the buyout, called the “premium.” The premium represents the difference between the estimated real value (market price) of a company and the actual price paid to acquire it. The premium therefore represents the wealth gains made by the pre-buyout shareholders. We will be using premium and pre-buyout shareholder wealth gains synonymously in this paper. While most PTP transactions involve a premium, this is not a guarantee. Previous research points towards the fact that the pre-buyout shareholders gain significant returns after the date of announcement of a takeover offer in UK and European markets (Goergen and Renneboog, 2004; Campa and Hernando, 2004) and in the US (Schwert, 1996). Earlier research found that pre-buyout shareholders obtained a premium of 56.3% and 56% in the US (DeAngelo et al., 1984; Lowenstein, 1985) while a later study done in the UK found the premium to be 44.9% when comparing stock price prior

to the announcement date (Weir et al., 2005a). The body of research strongly indicates that PTP LBOs tend to create value for the pre-buyout shareholders.

2.2. Theory and hypotheses

However, there is not a consensus in the research as to the extent in which different factors explain the wealth gains made from PTP transactions. An overview of the different hypotheses explaining the wealth gains made from PTP LBO transactions include tax benefits, incentive realignment, blockholders, free cash flow, wealth transfers, delisting cost savings, takeover defences, corporate undervaluation, and bidder competition. In this section, we will establish the literature behind these hypotheses.

2.2.1. Tax benefit theory

When a PTP transaction takes place, the acquirer typically leverages the target company's balance sheet to finance the buyout. The increased leverage from taking on large amounts of debt means that interest payments have to be paid in the future on account of the borrowed capital. Since these interest payments are tax deductible, they are essentially tax shields which improve the firm's return on equity and return on investment. In the seminal Lowenstein (1985) article, Lowenstein explains that although tax savings created in management buyouts (MBOs) are not new, the combined effect results in being able to finance a large portion (sometimes all) of the premium out of tax-generated cash flows. MBOs are a type of PTP LBO where a person from the corporate management or team purchases the business. The new acquirers are able to operate on a more or less tax-free basis for up to 6 years which is around the time necessary to be able to reduce the debt-equity ratio, thereby increasing the acquirer's chances of making an exit. Lowenstein takes the view that while MBOs have led to considerable financial returns for the pre-buyout shareholders, the gains are driven mostly by tax advantages rather than genuine economic improvements. Kaplan (1989b) also examined tax benefits in MBOs where he estimated the value of interest deductions as a fraction of the market adjusted premium post buyout. 3 different marginal tax rates (15%, 30%, 46%) are applied for the 2 periods he examines. His results were that the median value of tax benefits, estimated at the time the buyout company goes private, has a lower bound of 21% and an upper bound of 143% of the market adjusted premium paid to pre-buyout shareholders.

The literature seems to indicate that the increased leverage taken on in PTP transactions result in tax benefits due to the tax-deductible interest that emerges. Therefore we reach the following hypothesis:

Hypothesis 1: There is a positive relationship between the expected pre-buyout shareholder wealth gains from PTP LBO transactions and high company tax level as well as with low leverage ratios prior to the transaction.

For the majority of research done in the US during the 1980s, corporate interest expenses were fully tax deductible. This leniency was large, specifically before the Tax Reform Act of 1986, when the corporate tax rate was 46% (Kaplan, 1989b). The Tax Reform Act reduced the corporate tax rate to 34%. For Nordic countries, the largest change has been after the recommendation of Action 4 of the OECD/G20 Base Erosion and Profit Shifting Project finalized in 2015, which sought to limit interest deductions by capping them at 30% of EBITDA (OECD, 2015). As of 2019, the US, UK, and all Nordic countries have implemented this, with many countries undertaking limiting measures in the years leading up to the finalized recommendation (Burnett, 2019). However, research argues that not enough studies have examined the effects of these fiscal changes on returns in LBOs in Europe to reach solid conclusions (Renneboog and Vanseenkiste, 2017).

2.2.2. Blockholder theory

Lowenstein (1985) presented the carrot and stick theory, and the carrot part of the theory can be related to the blockholder theory. When ownership concentration increases, especially the ownership share, the rewards (carrot) from their effort increases, incentivizing people to invest. On the other hand, when a company is public and the ownership is largely dispersed, a common issue is that shareholders become “free-riders,” reaping the rewards without contributing towards the cost. A PTP transaction may strengthen oversight of the shareholder’s behavior, thereby minimizing free-riding and reducing the agency costs associated with addressing this issue (Grossman and Hart, 1980; Grossman and Hart, 1988; Easterbrook and Fischel, 1983; DeAngelo et al., 1984). We will focus on Grossman and Hart (1980), who further explain that the nature of the free-rider problem in the context of public vs. private transactions is related to the resources devoted by shareholders to improve management. When one shareholder invests time and resources to monitor management, the

benefits of the investment in monitoring is shared by all shareholders, making monitoring a public good. This is the externality that the takeover bid mechanism aims to address and incorporate. Because the benefits of monitoring are shared, individual shareholders may choose not to invest in monitoring activities, expecting that others will do it, leading to underinvestment by each shareholder. A shareholder who owns a substantial portion of a company's stock is known as a blockholder. Blockholders are generally more likely to invest in monitoring because their significant ownership gives them an increased incentive and increased ability to closely monitor managerial actions. In companies with strong ownership concentration, effective monitoring by blockholders already keeps agency costs low. Therefore, the benefits or wealth gains from the transition to a private company through a PTP transaction are less significant because the company doesn't suffer from high agency costs to begin with. Hence, when a company delists and becomes private, it can reduce agency costs by enhancing shareholder oversight. Additionally, Renneboog et al. (2007) argued that different types of ownership types have different monitoring abilities and found that corporation, institution, and individual/family blockholders had a strong impact on the acquisition premium.

If the ex ante company has a presence of blockholders that have significant monitoring ability before the acquisition, we therefore expect the pre-buyout wealth gains to be reduced, hence we reach the following:

Hypothesis 2: There is a negative relationship between the expected pre-buyout shareholder wealth gains from PTP LBO transactions and the presence of blockholder groups with a large degree of monitoring ability.

Regarding potential regional trends, Lekvall et al's (2014) book titled "The Nordic Corporate Governance Model" claims that active ownership dominates publicly held Nordic companies, with 62% of companies having at least one shareholder holding more than 20% of votes and 21% of companies having a shareholder holding more than 50% of the votes. This is in contrast with the US, where the concentration of ownership in institutional investors is larger. In the US, active owners who own a toe-hold stake will try to persuade these institutional owners of their strategic proposals, but it is up to the institutions to vote for the proposals. Lekvall et al. concludes that the Nordic ownership model includes the presence of an activist

owner and the absence of concentrated minority blockholders compared to the US. The culture of active ownership in Nordic firms may influence the hypothesis by making it less applicable or less strongly supported than the US or UK transactions.

2.2.3. Free cash flow theory

The idea behind the hypothesis in the context of PTP transactions can be traced to Jensen and Meckling (1976) who believed that debt pressure from leverage pushes managers to distribute future cash flows instead of investing in negative NPV projects. Jensen (1986) then built on Murphy's (1985) empirical results which examined executive compensation incentives and financial performance. Jensen argued that executives or senior managers are not incentivized to build shareholder value. Rather, they are incentivized to engage in what is today called "empire building," where they look to enlarge the firm beyond its ideal size. This option is not as easily available when the firm has taken on a large sum of debt instead of equity, as the firm's management are "locked" into paying out future cash flows (debt payments) instead of making negative NPV investments into projects that enlarges the firm. The stick part of Lowenstein's (1985) theory can be related to the free cash flow theory. When the firm leverages themselves, the risk of default (stick) motivates managers to run the firm efficiently. The stick argument is strengthened by Jensen (1986) who also finds the increased risk of default stemming from a LBO acquisition to encourage firm efficiency. In a 2 part study of MBOs between 1980 and 1987 it was further argued that the PTP MBO firms tend to have greater levels of cash flows as a percentages of sales and lower levels of receivables to sales prior to the buyout when compared to a sample group of industry-matched comparison firms (Singh, 1990).

The free cash flow hypothesis argues that largely levered firms will be encouraged to manage their funds more efficiently due to the "locking" effect of the future cash flows in terms of debt payments, reducing wasteful free cash flow. Based on this argument, firms that have large free cash flows should expect to see larger premiums, therefore:

Hypothesis 3: There is a positive relationship between the expected pre-buyout shareholder wealth gains from PTP LBO transactions and levels of free cash flows in the pre-buyout firm.

2.2.4. Undervaluation theory

The undervaluation hypothesis stems from the fact that the assets are undervalued from the acquirer's point of view and that there may be asymmetric information about the value that the firm can realise between management and non-management. Lehn et al. (1990) further explored how management's superior knowledge about a firm's true value can lead to perceptions of undervaluation in the public market. The public market's undervaluation may be intensified when smaller public companies struggle to generate interest among institutional stakeholders, financial analysts, and portfolio managers. These smaller firms may then fall into illiquid markets where trading volumes are thin and price discovery becomes inefficient because there are fewer transactions to reflect changes in market sentiment, company performance, or economic conditions. These pricing inefficiencies mean that valuations may remain "stuck" at outdated levels, failing to adjust to new information about the firm's intrinsic value.

Schadler et al. (1990) examined the unethical exploitation of shareholders by the managers pre-buyout in MBOs and argued that management are able to employ deliberate financial and accounting methods to lower the pre-announcement stock price when the management acquires the firm. Schadler et al's paper argued that legislative changes should be made, but supported the hypothesis that undervaluation is a factor affecting the premium in PTP transactions. It should be noted that DeAngelo (1986) does not support the hypothesis. She concluded that there was no significant evidence of pre-buyout earnings manipulation by incumbent management in her sample of 64 firms.

Although there is at least one paper unsupportive of the hypothesis, it seems that the majority of the literature leans towards the fact that the perceived undervaluation can motivate management or buyout specialists to initiate PTP transactions, seeking to realize the firm's hidden value. Therefore, we reach the following:

Hypothesis 4: There is a positive relationship between the expected pre-buyout shareholder wealth gains from PTP LBO transactions and the degree of share price undervaluation prior to the transaction.

A large part of the literature related to this hypothesis focuses on MBOs. However, we believe that this literature is applicable to all PTP LBOs as undervaluation creates opportunities for acquirers to pay premiums with the expectation of realising greater shareholder value post-transaction. We therefore argue that it is the acquirer's ability to identify undervaluation, due to asymmetric information or market inefficiencies, that are the drivers of expected pre-buyout shareholder wealth gains. This means that the acquirers do not necessarily have to be managers in the pre-buyout firm.

2.2.5. Bidder competition theory

The earlier literature points towards multiple bidders being related to larger premiums due to increased competition. Lowenstein (1985) came to the conclusion that transactions involving three or more different bidders resulted in 19% higher premiums paid to pre-buyout shareholders than transactions involving only one bidder in MBOs. Amihud (1989) explored large LBO transactions from 1983 to 1986 and found that out of the 15 largest deals, 9 of them involved multiple bidders. The premium paid in these 9 deals were on average 21.5% higher than the 6 deals with only a single bidder. Easterwood et al. (1994) investigated 184 MBOs from 1978 to 1988 and found that firms with one bidder had an average premium of 26.1% while firms with multiple bidders had an average of 43.7%, a difference of 17.6%.

Although the literature seems to be in agreement that bidder competition results in higher premiums, the interpretation of these higher premiums in contested LBOs may be more complex (Renneboog and Vanseenkiste, 2017). The seminal literature usually credits higher premiums to the competitive process. This is the case for the literature mentioned above, (Lowenstein, 1985; Amihud, 1989; Easterwood et al., 1994). However, later studies have argued that although PE deals with more than one bidder show increased post-buyout returns, there is no evidence that the returns are specifically associated with bidder competition (Guo et al., 2011). The more recent literature explains that deals for which there were more than one bidder involved companies that were performing well before the buyout. The argument provided is that the pre-buyout returns are explained by the target firm's ex ante performance and that multiple bidders is the residual effect when there is great ex ante performance. Therefore, there is the possibility that the increased premium in bidder competitive transactions has to do with undervaluation. Furthermore, Andres et al. (2007) brings forth the argument that the increased premiums in multiple bidder transactions may be due to

irrationality resulting from “deal fever,” where emotional decision making can overshadow the rational valuation process.

Despite the complexities and potential explanations regarding causality, the relationship between bidder competition and premium payments remains crucial. The literature seems to point toward bidder competition increasing the premium paid in PTP transactions. Therefore, we reach the following:

Hypothesis 5: There is a positive relationship between the expected pre-buyout shareholder wealth gains from PTP LBO transactions and the existence of multiple bidders pre-transaction.

2.2.6. Additional theories

There are additional theories that have not yet been covered in the literature review on drivers of acquisition premiums from PTP transactions. We have chosen not to explain these theories in depth as they will not be the focus in our study. However, we believe that it is valuable to have an understanding of these theories as well in order to obtain a holistic understanding of the PTP premiums. From the literature we have reviewed, we primarily find 4 additional theories and their hypotheses.

The first is the delisting cost saving theory. Public companies incur significant costs to maintain a stock exchange listing, including direct expenses like stock exchange fees and compliance costs, and indirect costs such as scrutiny from shareholders and managerial distractions (DeAngelo et al., 1984). Mehran and Peristiani (2009) argue that firms with low financial visibility, characterized by limited analyst coverage and low trading volumes, may find the costs of being public outweigh the benefits. The delisting cost-saving theory suggests that firms going private primarily benefit financially by avoiding these direct and indirect costs. There are smaller growth exchanges, such as NASDAQ First North Growth and Euronext Growth Oslo, where smaller firms are listed. The growth exchanges are likely to be cheaper. Since all PTP firms delist, only by comparing listings on national vs. growth exchanges could the costs from delisting be measured. Due to the limited sample size of firms listed on smaller exchanges to analyze against firms listed on national exchanges, we were not able to analyze this theory.

The second is the takeover defence theory, which explains that the ex ante premium is affected due to protection from takeovers resulting in a premium paid to pre-buyout shareholders in order to remain in control of the organisation (Michel and Shaked, 1986). We were unable to gather sufficient data from the databases we had access to in order to accurately include this theory in our analysis.

Third is the incentive re-alignment theory, which argues that going-private transactions motivates managers to act in accordance with investors'/shareholder' interests (Meckling and Jensen, 1976). This theory has a lot of similarities with the blockholder hypothesis. However, since this theory is solely focused on management buyouts, we did not find it suitable for our analysis.

Finally, the wealth transfer theory, which argues that the degree of bondholder protection in debt covenants has an effect on the ex ante premium (Weinstein, 1983; Shleifer and Summers, 1987). This theory is examined by assessing if debt covenants contain clauses restricting dividend distributions or the issuance of senior debt (Renneboog et al., 2007). Since almost no PTP LBO companies in Europe have traded bonds outstanding, we are not able to test this hypothesis (ibid).

3. Methodology

The objective of our study is to analyse the extent to which these factors explain the premium paid in PTP transactions. We will build our methodology upon Renneboog et al. (2007). Given the distinct scope of our analysis, we have made a few adjustments and additions to Renneboog's model in order for the model to align with the specific characteristics of our dataset. These modifications ensure that the model accurately reflects the unique contextual nuances of our study. We will define the scope and variables, ensuring that they align with the conceptual foundations of the hypotheses.

3.1. Premium analysis

There are generally two ways in which research on shareholder wealth gains in buyouts are conducted. The first methodology involves an event study and the second is a premium analysis. Renneboog et al. (2007) conducted both an event study and a premium analysis. An event study uses cumulative abnormal returns (CARs) to examine how new information affects asset prices. However, Renneboog et al. pointed out that LBO CARs are likely to be cross-sectionally incomparable because of the variability in the timing and nature of information disclosure driving stock-price reactions.

This paper has chosen to limit the scope of the analysis to a premium analysis similar to previous papers (Kaplan, 1989a; Kaplan, 1989b; Lehn et al., 1989; Halpern et al., 1999). As the premiums are calculated over the entire duration of the going-private transaction, they include all of the relevant information, thereby avoiding the limitations associated with the abnormal returns. The premium analysis focuses on the premium paid to pre-buyout shareholders in a transaction through analysing the firm-specific factors that drive the premium. Unlike the event study which analyses short-term market reactions to announcements of buyouts by measuring abnormal returns, the premium analysis centers on the magnitude of the premium paid relative to pre-transaction valuations (Renneboog and Vanseenkiste, 2017).

3.2. Cross-sectional scope

The premium analysis is intrinsically linked to a cross-sectional scope due to the firm-specific focus. The data analysed in this study has a cross-sectional structure even though the sample spans 23 years. Although the transactions occur in different years, our analysis does not track changes over time for the individual firms. Instead, we compare variations across firms based on their financial and operational metrics at one distinct point in time. This aligns with a cross-sectional scope, where the primary focus is on understanding differences across entities rather than examining trends or dynamics over time. The focus is exclusively on the company's firm-specific characteristics derived from the final annual report prior to the transaction. This ensures that each observation corresponds to a point in time that is contextually relevant to the firm's going-private transaction.

3.3. Data collection

Our sample data contains PTP LBO transactions for firms in the Nordic region from January 1, 2000. We gathered our sample data from Mergermarket, using the following criteria:

1. Deal completed date: 01/01/2000 to 31/12/2023
2. Country/Region: Sweden, Norway, Finland, Denmark
3. Deal Technique: Leveraged buyout
4. Deal value: 10mUSD or more

We restricted the deals to 10mUSD or more due to the lack of data for the majority of deals below this amount. This batch gave us a total of 591 buyouts. 480 buyouts were private-to-private. We also gathered acquisition-premium 1 month prior to the announcement date of the offer and the stake acquired on Mergermarket. 31 deals involved an acquired stake of less than 50%. Of the 8 firms without the premium 1 month to the announcement date on Mergermarket we gathered 2 from CapitalIQ and 1 from their annual report. The premium could not be conclusively found for 5 companies, rendering these inapplicable for analysis as well. We gathered the companies' financial statement data in WRDS Compustat. 13 companies had missing company information and/or missing accounting information. Our final sample after this process of elimination stood at 62 firms. We converted all the accounting and financial data to USD, using exchange rates for the specific date and currency used of each financial report using xe.com. The financial reports used for the data on the descriptive accounting statistics were gathered from WRDS Compustat and are from the final annual report before the transaction for each firm.

Table 1: Sample collection

Explanation	# of firms
First batch	591
Private-to-private transactions	-480
Non-majority stake	-31
Non-conclusive premium	-5
Missing company/accounting information	-13
Total eliminated firms	-529
Final sample	62

The shareholder information for the blockholder variables were found in Orbis in the shareholder history section. Two companies were missing from Orbis, and two others lacked

detailed pre-2002 data, hence were excluded. To determine corporate ownership at the announcement date, we used the latest shareholder information available before the announcement. Since Orbis provides shareholder data only by month and year, we used data from the closest month prior to the announcement month to avoid potential later dates within the same month of the transaction. We assumed that shareholders without post-announcement data had sold their shares prior to the transaction, thus including only those with ownership information after the announcement date.

Compustat was also used for the extraction and processing of historical daily closing prices. The exchange codes were mapped to determine each company's primary exchange. Among companies with multiple ISINs, we selected the ISIN with the highest average trading volume on the primary exchange and a sufficient number of trading days to ensure data reliability. If there was further uncertainty about the correct ISIN code, we verified by ensuring that the daily price data ceased during the same time period as the acquisition's completion date. Once the appropriate ISINs were identified, we measured the share price performance from 300 days before to 41 days before the announcement date of the PTP transaction (if the date occurred on a non-trading day, the closest day was used), while also collecting the potential split or reverse split terms for each share during the period.

Simultaneously, we measured the market performance for the respective markets during the same period to provide a benchmark for comparison. From Compustat, the stock exchange code was retrieved for each selected ISIN and matched each share to the appropriate market index based on its primary exchange, using the country-specific components of the FTSE All-World Index Series.

For the bidder competition control variable the data was obtained from Mergermarket, where each target-company's intelligence timeline was reviewed for any offer price revision or indication of multiple bidders. Out of the sample, 20 companies exhibited signs of bidder competition.

3.4. Dependent variable

Premium (PREM): Our dependent variable is the premium paid to pre-buyout shareholders. The premium is obtained through calculating the percentage in share price difference of the period in between two events, the two events being: (1) the pre-buyout announcement share price and (2) the final price offered. There is not a consensus on how to define these two events.

The definition of the first event (pre-buyout announcement share price) depends on the time frame chosen before the announcement of the initial acquisition offer. This lag-period is needed in order to capture the share price increase (or decrease) in the timeframe preceding the announcement of the initial acquisition offer. Renneboog et al. (2007) calls this the “anticipation window” and observed premiums for PTP transactions for anticipation windows of 1, 10, 20 and 40 days for 177 firms. The mean values were 37%, 41.1%, 41%, and 40.1%, respectively. This shows the minor differences in the anticipation window chosen, as long as it's between 10-40 days. This analysis will define the pre-buyout share price as one month prior to the announcement of the initial acquisition offer.

Previous studies have defined the second event (final price offered) as the last market-traded price of the shares prior to delisting (Halpern et al., 1999; Lehn et al., 1989). However, we will define this event as the final offer price of the successful bid, such as Harlow et al. (1993) and Renneboog et al. (2007). This decision is motivated by the argument that the ultimate evaluation of the final bid cannot be determined from stock market data since PTP bids often include payments in loan notes. Therefore, we deem that the market value should not be derived from the last traded share price, as tendered shares are not sold through the market (ibid).

Finally, Renneboog et al. (2007) obtains the premium by taking the logarithm of the quotient. We will not use the logarithm, as we believe our analysis will benefit from the direct representation of taking the percentage increase or decrease, such as Kaplan (1989a). The reduction in variability, stemming from using the logarithmic value may mask important

differences in the data, which is why we will use the direct representation to fully capture the extent of variation in acquisition premiums.

$$PREM = \frac{\text{Final price offered}}{\text{Price one month prior to announcement}} - 1$$

3.5. Independent variables

We have defined the majority of the independent variables as Renneboog et al. (2007) and in a few cases made minor adjustments to match the contextual difference of our analysis. These adjustments will be explicitly highlighted. The largest difference related to our choice of independent variables is that we have included a control variable related to the financial crisis of 2007-2009, which Renneboog et al.'s 2007 paper did not incorporate. Furthermore, Renneboog et al. tests 3 more hypotheses in their premium analysis than this paper and therefore has more variables included in their model.

Taxes/Revenue (T/R): Since firms with high taxes are suggested to have greater potential for tax benefits, this measure becomes a direct proxy for the mentioned hypothesis. By normalising taxes relative to revenue, this measure accounts for differences in firm size and scale, reflecting the real economic cost of taxes relative to a firm's operational performance. Furthermore, this measure avoids biases inherent in more aggregated measures like total taxes or effective tax rates which may obscure firm-specific differences. This variable is calculated using the Compustat definition of total income taxes imposed by federal, state and foreign governments, which includes current, deferred (current year's deferrals less the amortization of prior year's deferrals) and other income taxes.

$$T/R = \frac{\text{Total income taxes}}{\text{Revenue}}$$

Debt-to-equity ratio (D/E): The debt-to-equity ratio is a standard and universally accepted measure of financial leverage and directly measures the firm's capacity to take on additional debt. As explained in the literature review, firms with low leverage are expected to command higher premiums as they provide more room for leverage and consequently, tax benefits.

Hence, the ratio becomes a tangible metric for the extent to which firms are able to leverage additional debt to generate tax shields.

$$D/E = \frac{\text{Debt in current liabilities} + \text{Long term debt}}{\text{Common/ordinary equity}}$$

It should be noted that Renneboog (2007) includes a tax variable and an interaction term of taxes and performance, a dummy variable (1=yes) if return on assets is above median because high tax levels could potentially reflect past profitability. We have chosen not to include this variable in our model as we believe that this variable will avert the focus on direct determinants of premium. We believe that by not including this variable, we avoid overfitting and adding unnecessary complexity to the model from a measure that does not have strong enough empirical or research justification. Our belief that the measure doesn't have research justification stems from the argument that Renneboog et al. (2007) is the only paper that includes this interaction term from the previous literature on the subject and this measure was not found to be significant in their model.

Blockholders (INBH, COBH, IFBH): From the literature, we have the indication that the agency costs related to making sure shareholders invest in monitoring are reduced when a company goes from public to private. Furthermore, the benefits from the going-private transaction are more significant if the pre-transaction firm has a low level of shareholder concentration. According to Renneboog et al., institutional, corporate, and individual/family blockholders are the blockholder types that are likely to have significant influence relating to monitoring ability. Therefore, we test if this holds for Nordic PTP LBOs. Hence we have the following three variables:

Institutional blockholder (INBH)
Corporational blockholder (COBH)
Individual/Family blockholder (IFBH)

We define blockholders as shareholders owning over 5% of the shares in the company. If a company had multiple shareholders owning over 5%, each was included. When ownership was indicated as "greater than" a percentage, we used that percentage as it is the minimum

value. For each of the three blockholder types, we use a dummy variable where 1=yes if there is a presence of a blockholder (at least 5% ownership). Using a dummy variable (1=yes) both aligns with the literature (Renneboog et al., 2007) but is also based on the argument that blockholders should not be measured as a continuous variable as they only have a significant impact if they are concentrated in the specific firm analysed.

Free cash flow (FCF): The literature review suggests that free cash flow signals greater value creation potential in a transaction due to the addressing of inefficient spending tied to excess liquidity post going-private. This measure, then, is the measure of a firm's excess liquidity which can be misallocated by managers due to agency problems in the ex ante firm. In contrast to Renneboog et al., this variable will be calculated as the logarithm of free cash flow. As the sample companies are of various sizes, representing free cash flow as the logarithm helps to control for the scale differences among firms, normalizing the distribution and thereby reducing the impact of the extreme values larger companies will bring. We have defined the free cash flow variable as:

$$FCF = SIGN(Operating\ Cash\ Flow - CAPEX) \cdot \ln(| Operating\ Cash\ Flow - CAPEX | + 1)$$

This calculation is applied to handle both positive and negative free cash flow values while reducing the influence of extreme values and normalizing the variable for comparability across firms of different sizes.

Market excess return (MEXR): Excess stock return, which is the stock return relative to its respective market index, is a clear measure for capturing the firm's valuation related to other firms. The indices are country-specific components of the FTSE All-World Index Series, representing the performance of large and mid-cap equities in Denmark, Finland, the UK, Norway and Sweden, respectively. By focusing on pre-transaction stock performance, this measure directly reflects firm valuation in relation to overall market movements.

The specific time window (-300 to -41 days prior to announcement) was chosen to capture a stable period preceding the event while avoiding the volatility and potential bid rumors that can occur immediately before an announcement. To ensure accurate comparisons over time, share prices were adjusted for stock splits using our own calculations for adjustment factors

based on the terms of the split provided by Compustat. The undervaluation variable is therefore calculated as:

$$MEXR = \left(\frac{\text{Share price (upper date)}}{\text{Share price (lower date)}} - 1 \right) - \left(\frac{\text{Market index (upper date)}}{\text{Market index (lower date)}} - 1 \right)$$

Assessing both the individual share performance and the market performance over the specified period gives a comprehensive view of each stock's behaviour relative to its broader market context.

Bidder competition (BICO): The literature suggests that multiple bidders in the acquisition process for a PTP company are likely to increase the premium paid. Specifically, the companies have been classified according to any documented bid rumours or revised offer prices, indicating that competitive bidding likely influenced the final offer. This classification helps to capture instances where multiple bidders or market interest impacted the takeover premium. The measure we use is a dummy variable (1=yes) if there are multiple bidders in the acquisition process leading up to the final purchase.

3.6. Control variables

We include two control variables that we believe account for external factors that could influence the dependent variable but are not the primary focus of the study.

Size (SIZE): Similarly to Renneboog et al. (2007) we have the logarithm of total assets as a control variable:

$$SIZE = \ln(\text{Total Assets})$$

Although it is not explicitly explained in the Renneboog et al. paper, we infer that this decision is made due to Kieschnick (1998). Kieschnick's paper was an evaluation of Lehn et al's (1989) paper which was frequently cited as providing evidence for Jensen's (1986) free cash flow hypothesis. Lehn et al. (1989) combined the multiple economic factors (free cash flow, firm size, leverage) into a single variable. Kieschnick redefined these variables by decomposing them into individual variables. His results showed no support for the free cash

flow hypothesis but rather that firm size was one of the significant determinants of premiums and that larger firms tend to receive higher premiums.

However, later studies seem to be in opposition to the older literature. Moeller et al. (2004) examines 12,023 acquisitions by public firms from 1980 to 2001 and finds that announcement returns are approximately two percentage points higher for small acquirers compared to large ones. The results are robust in the sense that the size effects do not diminish or reverse in later years, suggesting a persistent phenomenon. The higher returns for small acquirers are consistent regardless of the form of financing used for the acquisition. Moeller's findings are independent from whether the acquired firm is public or private. We then choose to include size as a control variable as the previous research seems to suggest that this variable has an effect on premium.

Financial crisis (FICR): Following the 2007-2009 financial crisis, both macroeconomic data and academic research points toward the most severe economic contractions occurring in 2009. Verick and Islam (2010) highlight that while the financial market turmoil began in 2007 and worsened in 2008, the full economic ramifications peaked in 2009. Thakor (2015) emphasised that the real economic consequences of the financial crisis related to reduced lending, corporate liquidity constraints, and economic contraction, became most evident in 2009. We have not come across any widely cited papers on our topic that specifically controls for the financial crisis. It should be mentioned that Dietz's (2015) master thesis dissertation which examines the premium paid for staying in control of the firm, includes a control variable for the financial crisis. The reported findings indicate that the control premium fell significantly during the financial crisis. We therefore control for transactions completed in 2009, through a dummy variable where (1=yes) if the transaction was completed in 2009.

3.7. Outliers

To address the presence of outliers in the dataset and to preserve its integrity given the relatively small sample size, winsorization was employed instead of exclusion. The decision to winsorize at these specific levels was based on the distribution characteristics of the variables and the need to balance outlier mitigation with data preservation. For *PREM*, *T/R* and *D/E*, a 5% winsorization was sufficient to address the most extreme values that could

disproportionately affect the regression results. For *MEXR*, which exhibited fewer extreme values, a more conservative 1% winsorization was applied.

This approach ensures that the statistical analysis is not excessively influenced by extreme observations, which is particularly important in a smaller dataset such as ours where outliers may have a more pronounced effect on the results.

3.8. Model

In order to conduct the cross-sectional regression we adopt an ordinary least squares (OLS) model similar to the approach utilised in Renneboog et al. (2007). The OLS is chosen as it provides a clear estimate of coefficients, allowing us to evaluate how changes in the independent variables influence the *PREM*, directly linking to our research hypotheses. The dependent variable in our OLS regression is *PREM*. The independent variables include *T/R*, *D/E*, *EXRE*, *FCF*, *INBH*, *COBH*, *IFBH*, and *BICO* as well as the control variables *SIZE* and *FICR*. From this, we estimate the following linear regression model:

$$PREM_i = \beta_0 + \beta_1 T/R_i + \beta_2 D/E_i + \beta_3 INBH_i + \beta_4 COBH_i + \beta_5 IFBH_i + \beta_6 FCF_i + \beta_7 MEXR_i + \beta_8 BICO_i + \beta_9 SIZE_i + \beta_{10} FICR_i + \epsilon_i$$

Our model is designed to examine the determinants of *PREM* in PTP transactions, focusing specifically on testing the hypotheses outlined in section 2.2.

4. Results

In this section we will present the results of our study, starting by presenting the findings of the descriptive statistics of the sample and thereby the analysis of our findings regarding the drivers of pre-buyout shareholder wealth gains from going private.

4.1. Descriptive statistics

An observation that stands out is the highly skewed Total Assets seen in the difference between the mean of 1009.97 and the median of 265.91, as can be seen in Table 2. This difference indicates that there is a presence of a few exceptionally large firms, such as TDC A/S, the largest firm in our sample which has total assets of 14839.83 which skews the mean upwards. When compared to similar studies in different regions, this paper's sample of firms

show a significantly larger mean and standard deviation, Andres et al., (2007) for Europe, Renneboog et al., (2007) for UK, Kaplan (1989a) for US. Notably, the minimum value of the *T/R* variable is -15.72%, indicating that at least one firm in the sample has negative total income taxes. As seen in Appendix 13, this is most likely due to net tax deferrals, which exhibit a negative mean and median at -0.4083 and -0.031 respectively.

Performance measured by return on assets spans a wide range with extreme underperformance for the lower range at -139.98% considering the mean of 4.04%, similar to *FCF* to assets with the minimum being -766.99% with a mean of 20.88%. The high variability and extreme *D/E* values, ranging from -197.45% to 2348.42%, highlight significant differences in leverage across firms, with some being highly leveraged and others even having negative equity. *PREM*, averaging 35.76% but reaching as high as 257.14% further illustrate the heterogeneous deal dynamics, this time skewing toward the max values.

Table 2: Descriptive statistics of accounting and price based measures

	Mean	Median	Std.dev	Max	Min
<u>Firm size</u>					
Total revenue	699.28	195.50	1430.13	7392.30	3.76
Total assets	1009.97	265.91	2189.11	14839.83	4.58
Total market value	735.88	194.91	1493.21	8767.45	6.62
<u>Performance</u>					
Return on assets (%)	4.04	6.42	19.79	20.96	-139.98
<u>Leverage & taxes</u>					
Debt to equity (%)	148.27	74.70	381.46	2348.42	-197.45
Taxes (% of revenue)	1.55	1.43	3.76	20.93	-15.72
<u>Cash flow and retention</u>					
Cash to assets (%)	11.54	11.07	9.51	51.09	0.00
Free cash flow (% of assets)	20.88	21.04	119.23	179.67	-766.99
<u>Stake & premium</u>					
Stake acquired (%)	92.71	100.00	12.19	100.00	55.27
Premium (%)	35.76	28.33	37.76	257.14	-23.91

Table 3 shows that individual shares of the sample companies exhibited significant variability 300 to 41 days before the announcement, with a mean return of 3.26% and a median of -4.25%, indicating skewness due to a few high-performing shares. The standard deviation was high at 42.62%, with returns ranging from -71.20% to 210.32%. As per expectation, the market indices were more stable with a standard deviation of 17.23%. The high standard deviation of *MEXR* (40.39%) indicates considerable dispersion, with some shares

significantly underperforming or outperforming the market (ranging from -85.92% to 212.41%). *MEXR* had a mean of -2.39% and a median of -8.19%, suggesting that the sample shares underperformed the market on average.

Table 3: *MEXR*

	Mean	Median	Std.dev	Max	Min
Returns (%)					
Stock performance	3.26	-4.25	42.62	210.32	-71.20
Market index performance	5.65	7.62	17.23	33.63	-45.22
<i>MEXR</i>	-2.39	-8.19	40.39	212.41	-85.92

Table 4 summarizes shareholders with over 5% stakes in the sample firms before transaction. Means, medians, and standard deviations are calculated conditional on the presence of a stake for the specific shareholder type. Corporate shareholders hold an average of 22.73% and dominate 65% of firms, while institutional investors (mutual funds and pension funds, insurance companies, private equity fund/venture capital, financial companies) have a mean stake of 26.97% and dominate 52.94% of firms. On average, the dominant shareholder holds 22.23% of shares. The Herfindahl-Hirschman Index (HII), in the context of shareholder ownership measures the concentration of the shareholdings for the sample firms and indicates a moderate ownership concentration in the sample firms of 11.85% on average.

Table 4: *Descriptive statistics of blockholders*

	Mean	Median	Std.dev	Presence	Dominance
Corporate	22.73	22.00	13.93	32.26	65.00
Private equity/venture capital fund	15.78	14.19	12.26	9.68	50.00
Mutual and pension fund	26.97	14.74	27.40	27.42	52.94
Financial company	16.65	11.46	12.68	30.65	42.11
Individual or family	14.57	10.00	13.81	17.74	27.27
Self ownership	1.00	1.00	N/A	1.61	0.00
Employees, managers, directors	N/A	N/A	N/A	0.00	N/A
Bank	17.87	10.73	19.08	12.90	25.00
Unnamed shareholders	46.12	41.59	41.65	6.45	75.00
Insurance company	11.58	8.62	8.07	12.90	50.00
Public authority	8.41	8.41	N/A	1.61	100.00
Dominant shareholder	22.23	16.85	23.76	100.00	N/A
Herfindahl index	11.85	3.86	20.27	100.00	N/A

n=58

Table 5 presents the sample period/country, type of deal, anticipation window, number of firms, and mean acquisition premiums for our study compared to the earlier literature. Our analysis shows a mean acquisition premium of 35.76%, which is the lowest premium reported compared to the earlier studies.

Table 5: Premium paid in PTP transactions

Study	Sample period/country	Type of deal	Anticipation window	N	Mean acquisition premium
DeAngelo, et al. (1984)	1973-1980 US	All	40 days	72	56.30%
Lowenstein (1985)	1979-1984 US	MBO	30 days	28	56.00%
Lehn, et al. (1989)	1980-1987 US	All	20 days	257	36.10%
Amihud (1989)	1983-1986 US	MBO	20 days	15	42.90%
Kaplan (1989a,b)	1980-1985 US	MBO	2 months	76	42.30%
Asquith, et al. (1990)	1980-1988 US	All	1 day	47	37.90%
Harlow, et al. (1993)	1980-1989 US	All	20 days	121	44.90%
Travlos & Cornett (1993)	1975-1983 US	All	1 month	56	41.90%
Easterwood, et al. (1994)	1978-1988 US	MBO	20 days	184	32.90%
Weir et al. (2005a)	1998-2000 UK	All	1 month	95	44.90%
Renneboog, et al. (2007)	1997-2003 UK	All	40 days	177	40.10%
Chun & Ekenhammar (2024)	2000-2023 Sweden, Finland, Denmark, Norway	All	1 month	62	35.76%

All=all going-private deals, MBO=MBO deals only, n=number of sample firms

4.2. Analysis of results

This section presents the empirical findings of the study, structured around the hypotheses outlined in 2.2. Each hypothesis is examined with its corresponding results and interpretations in relation to the existing literature. The results of the OLS regression model are presented in Table 7 and a summary of the results is presented in Table 6.

The model's residual standard error (RSE) is reported at 0.1888 with 51 degrees of freedom, suggesting a moderate level of precision in the predictions. The multiple R-squared has a value of 0.4286, showing that approximately 42.86% of the variance in *PREM* is explained by the variables included in the model. The adjusted R-squared is lower, at 0.3165, accounting for the number of predictors in the model relative to the number of observations,

which is providing a more accurate measure of the model's explanatory power by controlling for the inclusion of non-significant variables. This decrease suggests that some of the included variables do not contribute significantly to the model, as seen in Table 7 and further explained in this section. The model is highly statistically significant with a F-statistic of 3.825 and p-value of 0.0006741, indicating that the set of independent variables collectively has a highly significant impact on *PREM*. However, over 68% of the variability in *PREM* remains unexplained by the current model.

Table 6: Summary of hypotheses and results

Hypotheses	Variable	Expected sign	Result
H1: Tax benefits	<i>TPR</i>	+	Not significant
	<i>D/E</i>	-	Not significant
H2: Blockholders	<i>INBH</i>	-	Not significant
	<i>COBH</i>	-	Not significant
	<i>IFBH</i>	-	Not significant
H3: Free cash flow	<i>FCF</i>	+	Strongly positive
H4: Undervaluation	<i>MEXR</i>	-	Strongly negative
H5: Bidder competition	<i>BICO</i>	+	Strongly positive
Control variables	<i>SIZE</i>	N/A	Strongly positive
	<i>FICR</i>	+	Strongly positive

Table 7: OLS regression for premiums in PTP transactions

	Coefficient estimate	Standard error	t-value	p-value	Significance
Intercept	0.4768	0.1028	4.637	<0.001	***
T/R	2.8602	2.0553	1.392	0.170	
D/E	0.0280	0.0305	0.919	0.363	
MEXR	-0.2312	0.0815	-2.836	0.007	***
FCF	0.0218	0.0089	2.432	0.019	**
INBH (1=yes)	-0.0691	0.0543	-1.273	0.209	
COBH (1=yes)	-0.0523	0.0526	-0.994	0.325	
IFBH (1=yes)	0.0836	0.0750	1.114	0.270	
BICO (1=yes)	0.2058	0.0569	3.617	<0.001	***
SIZE	-0.0584	0.0180	-3.248	0.002	***
FICR (1=yes)	0.5568	0.2047	2.720	0.009	***
Residual standard error	0.1888 (51 degrees of freedom)				
Multiple R-squared	0.4286				
Adjusted R-squared	0.3165				
F-statistic	3.825				
p-value	0.0006741				

4.2.1. Hypotheses testing

The first hypothesis posited a positive relationship between *PREM* and *T/R*, as well as a negative relationship with *D/E*. The results yield a positive coefficient for *T/R* at 2.860 and $p = 0.170$. Furthermore, opposed to what was hypothesized, the *D/E* showed a positive coefficient of 0.0280 and $p = 0.363$. Weir et al. (2005a) and Andres (2007) report that tax advantages of leverage are less pronounced in the UK and Europe than in the US, with Renneboog et al. (2007) finding both of these variables insignificant in a study done in the UK. We therefore do not find support for the tax benefit hypothesis and our findings suggest that tax advantages of leverage in the Nordics are more similar to the UK in being less pronounced than in the US.

The second hypothesis proposed that a lower *PREM* will be paid for firms with a high concentration of outside shareholder ownership groups with significant monitoring ability pre-transaction. The hypothesis proposed a negative relationship. Our regression showed negative coefficients for both *INBH* and *COBH*. However, neither was statistically significant, with p -values of 0.209 and 0.325, respectively. The *IFBH* variable had a positive coefficient of 0.084, also not statistically significant ($p=0.270$). These results suggest that higher ownership concentration by *INBH* and *COBH* might be associated with lower *PREM*, aligning with the literature (Grossman and Hart, 1988; Renneboog et al., 2007). The positive coefficients for *IFBH*, though insignificant, hints at a possible opposite effect. Nevertheless, because of the insignificance of these results, we cannot draw definite conclusions.

The regression analysis provided significant support for the third, fourth, and fifth hypotheses. The third hypothesis asserted a positive relationship between *PREM* and *FCF* in the pre-buyout firm. The coefficient for *FCF* was positive at 0.022 and statistically significant at the 5% level ($p=0.019$), indicating that firms with higher *FCF* levels are associated with higher *PREM*. This is in support of Jensen (1986) and Lehn and Poulsen (1989).

The fourth hypothesis posited a positive relationship between *PREM* and the degree of share price undervaluation prior to the transaction. Since higher *PREM* are expected for more undervalued firms, we anticipated a negative coefficient for *EXRE*. The analysis yielded a negative coefficient for *EXRE* at -0.231, which was statistically significant at the 1% level (p

= 0.007) supporting Kieschnick (1987), Lehn et al. (1990), Shadler et al. (1990) and unsupportive of DeAngelo (1986).

Finally, the fifth hypothesis stated a positive relationship between *PREM* and the existence of multiple bidders prior to the transaction. The regression analysis showed a positive coefficient for *BICO* at 0.206, which was highly significant ($p < 0.001$), demonstrating that the presence of bidder competition leads to higher acquisition premiums. We thereby find support for Lowenstein (1985), Amihud (1989), Easterwood et al. (1994).

4.2.2. Additional findings

We control for firm size through the natural log of total assets and the financial crisis through a dummy variable for deals in 2009. The regression analysis revealed a negative coefficient for *SIZE* at -0.058, which was statistically significant at the 1% level ($p = 0.002$). This indicates that smaller firms tend to receive higher *PREM*, supporting Moeller et al. (2004) and opposing Kieschnick (1998).

We also control for the financial crisis through the dummy variable of deals occurring in 2009. The dummy variable *FICR* had a positive coefficient of 0.557, significant at the 1% level ($p = 0.009$), suggesting that transactions taking place during the height of the financial crisis were associated with an increase in acquisition premium.

4.3. Robustness checks

To ensure the reliability of our results, several robustness checks were performed to verify that the findings do not violate the regression assumptions as well as examining the reliability of the model.

4.3.1. Diagnostic checks for regression validity

The correlation matrix (Appendix 1) for the independent variables shows no evidence of correlation issues, with all correlations well below 0.5. To assess the presence of multicollinearity, the variance inflation factor (VIF) was calculated for each variable in our data set. As shown in Appendix 2, all VIF values are below 1.5.

To address potential heteroskedasticity and autocorrelation in the regression residuals, which violate the Gauss-Markov assumptions and can result in biased standard errors, the robust standard errors were estimated using clustered standard errors and heteroskedasticity-consistent standard errors (HC1). Upon adjusting the standard errors, it was observed that all of the statistically significant coefficients remained statistically significant (Appendix 3-4).

The HC1 covariances were close to singular for observation 54 which was the max *PREM* value, suggesting that this data point may have high leverage. When the model was re-estimated without observation 54, the re-estimation showed that excluding observation 54 did not materially affect the model and all prior significant independent variables retained significance (Appendix 10). Therefore, it can be concluded that the results are robust to the presence of this observation.

Additionally, a Breush-Pagan test was conducted to test the assumption of homoscedasticity (Appendix 14). We fail to reject the null, finding no evidence of heteroskedasticity, and can therefore support the homoscedasticity (p-value=0.406).

4.3.2. Winsorization and dependent variable definition

Regarding the handling of outliers outlined in section 3.7, the model was also evaluated without winsorization (Appendix 8). Without winsorization of the dependent variable, all key variables remained statistically significant but the adjusted R-squared increased to 0.664 (from 0.317). This indicates that the results presented still hold when including uncapped outlier values. However, as the outlier value disproportionately improves the model, the winsorization provides the most accurate representation. It should also be noted that the residual standard error increases without winsorization to 0.219 (from 0.189), indicating a reduction in the accuracy of the model, further justifying our use of winsorization.

As an additional robustness check, we performed the regression using the Renneboog et al. (2007) definition of the dependent variable, the natural logarithm of the final price offered divided by the pre-announcement share price, instead of winsorizing *PREM* (Appendix 9). The significant variables in our study remain significant even with this change, reinforcing the robustness of the results. With this change, the adjusted R-squared increases to 0.467 and the RSE decreases to 0.165. However, we believe that this definition excessively reduces variability in the dependent variable, artificially improving the model's fit.

4.4. Nonlinearity findings

We performed the Ramsey RESET test to assess whether the baseline linear model might be missing important nonlinear terms (Appendix 15). While this result does not definitively reject the linear specification ($p = 0.052$), it suggests potential misspecification, warranting a further exploration of nonlinear relationships. To further explore, we applied a Generalized Additive Model (GAM). The GAM analysis introduced smooth functions for each predictor except the dummy variables (which remain categorical), revealing that the independent variables T/R and D/E may have a more complex form, as reflected by the significant effective degrees of freedom (edf) in Appendix 5. These results align with their insignificance in the OLS model and highlight potential curvature that OLS fails to capture.

To visualize the form, we created LOESS-smoothed scatter plots of both T/R and D/E against $PREM$. The D/E plot shows some curvature (Appendix 12), but the pattern seems to be heavily influenced by a few sample firms in the higher range, making it difficult to interpret accurately. The T/R LOESS plot suggests a nonlinear relationship where premiums appear high at negative tax levels, declines at low levels, and then rises again at higher taxes before plateauing as shown in Appendix 11.

To formally capture the nonlinearity suggested by the LOESS plot, we introduced polynomial terms for the T/R variable (Appendix 7). Under a third-degree polynomial specification, we found that the second polynomial term was significant at the 5% level ($p=0.017$) and the third polynomial term was significant at the 10% level ($p=0.063$). These results suggest that the T/R - $PREM$ relationship may be more complex, supported by the increase in the explanatory power of the model where the adjusted R-squared increased from 0.3165 to 0.4088, while decreasing both p-value and RSE. However, while the cubic specification adds explanatory power, it does not conclusively establish a stable nonlinear trajectory for the T/R variable, particularly given the sensitivity to higher-order terms and risk of overfitting.

To address this limitation and explore a more flexible representation of the T/R - $PREM$ relationship, spline functions were employed, allowing the data to determine the shape of the curve without assuming a specific polynomial form (Appendix 6). Even though the spline model yielded a slightly lower adjusted R-squared compared to the cubic polynomial model, the first spline basis function for T/R was statistically significant at the 5% level ($p=0.012$).

This also suggests that *PREM* may decline more sharply than a linear model would predict as *T/R* increases from very low levels.

Throughout these changes, the main drivers remained significant, and their estimated effects did not shift materially. Thus, while both the spline and polynomial models provide evidence of nonlinearity, the findings are not consistent across the entire range. Instead, it highlights that the *T/R* variable's relationship with *PREM* may be more nuanced than the simple OLS model would suggest, making the conclusions suggestive rather than definitive.

5. Discussion

When comparing the strength and explanatory power of the regression model in this study with that of our benchmark study Renneboog et al. (2007), we can see that our model has a slightly higher explanatory power for both the model (Multiple R-squared value of approximately 0.429 compared to 0.419 and 0.382) and when adjusting for the number of predictors in the model relative to the number of observations (Adjusted R-squared at 0.317 compared to 0.295 and 0.271). Despite the differences in sample sizes and regional focus, both studies leave a large portion of the variance in acquisition premiums unexplained, over 68% in the current study and approximately 70% in Renneboog et al's study, suggesting that most of the variation lies in variables that are not included. While this suggests that the model has limited explanatory power, it holds up reasonably well with previous research.

Our findings strongly support the undervaluation hypothesis through the variable *EXRE*, aligning with the US findings of Lehn et al. (1989) and Kieschnick (1987) while contradicting DeAngelo (1986), who found no evidence of undervaluation as a driver of buyouts. The alignment with the majority of US studies reflects the shared dynamic that is likely present internationally where undervalued firms in less liquid or inefficient markets present opportunities for buyout acquirers to unlock hidden value. These findings are logical in the Nordic context, as there may be more under researched firms and smaller, less liquid markets than in the US which further enhances the prevalence of undervaluation as a motivating factor in buyouts.

BICO exhibited the highest significance out of all variables, indicating that multiple bidders significantly increased the acquisition premiums. Our findings support the earlier studies by Lowenstein (1985), Easterwood et al. (1994), and Amihud (1989), which reported similar

effects in US markets in the 1980s. However, Guo et al. (2011) suggested that higher premiums may not be due to competition caused by multiple bidders but rather due to the inherent attractiveness of undervalued firms, which then will naturally attract multiple bidders. This raises the question of whether bidder competition and undervaluation are causally related and may suggest that undervaluation could be a precursor to bidder competition. However, as shown in Appendix 1, the correlation between these variables are negligible (-0.13). Our findings seem to suggest that while undervaluation and bidder competition both significantly drive premiums, they may do so independently rather than through a direct causal relationship, contrasting from the findings of Guo et al. (2011).

We also find support for the free cash flow hypothesis. This finding aligns with the US literature but is contrary to Renneboog et al, who did not find significant support for the free cash flow hypothesis in the UK. We should point out that our variable definition differs, as described in section 3.5. When considering the mean values of market value, stake acquired and premium in Table 2, a one unit increase in the *FCF* corresponds to a five fold increase in the premium paid (in USD). We can therefore draw the conclusion that even modest proportional increases in *FCF* have a meaningful effect on premiums in the Nordics.

Our analysis revealed that the mean acquisition premium in our study is 35.76%, which is the lowest premium reported compared to the earlier studies from the 1980s and 1990s, and 2000s, as seen in Table 5. This observation aligns with Renneboog and Vanseenkiste's (2017) suggestion that acquisition premiums have decreased over time. Acquisition premiums were around 45% during the 1980s LBO wave but declined to approximately 30% in the early 2000s. Renneboog et al. notes that the effects including market efficiency, better corporate governance practices, and more accurate firm valuations may contribute to the decline.

We expected that the existence of blockholders would lead to lower premiums due to already effective monitoring. Renneboog et al. (2007) found support for the negative relationship between all three blockholder concentration variables and premiums in the UK context which the US literature also supports, which our findings did not reflect. It then seems that the presence of blockholder groups with a large degree of monitoring ability does not affect the premium to a similar extent in the Nordics. This may be due to differences in the ownership

models of corporate governance. The Nordic ownership model is characterized by the presence of an activist owner and the absence of concentrated minority blockholders compared to the US (Lekvall et al. 2014). The active owner's control enables significant influence over decision-making and the absence of concentrated minority blockholders seems to limit the influence of blockholder dynamics on buyout premiums. Hence, in the Nordics, the role of monitoring by blockholders is likely complemented or substituted by stronger regulatory protections for minority shareholders and a governance culture emphasizing active ownership control, which may reduce the effect of blockholder intervention on premiums.

The tax benefit variables, T/R and D/E , were statistically insignificant. Tax benefits associated with increased leverage may have been more pronounced in the US due to fully tax deductible interest expenses in the 1980s, which may explain why the tax benefit hypothesis is often supported in the US studies during that time period (Kaplan, 1989b). Since the finalization of Action 4 of the OECD project in 2015, most countries have implemented the recommendation to limit interest deductions at the recommended 30% of EBITDA, including the US, UK, and the Nordics as of 2019 (Burnett, 2019).

Given the signs of nonlinearity in the T/R as a driver of the premium presented in section 4.4, it seems reasonable that the regulatory constraints, specifically the limitations on interest deductibility, is a factor. This tax policy creates thresholds that cap the potential benefits of leveraging tax shields, altering the linear relationship one might expect if tax savings would scale smoothly with higher taxes, such as in Kaplan's (1989b) study. This is visually apparent in the Appendix 11, showing that the regulatory constraints in Nordic countries could be the reason behind the insignificance of T/R in a linear model. This is also enforced by the findings outlined in section 4.5, as the interest deductibility limitations seem to create another inflection point at around 2% T/R , where the premium plateaus.

The sample transactions, occurring during the span of 2000-2023 has experienced differing tax limitations concerning the interest deductibility. As the finalization of Action 4 occurred during our sample period, the effect is reserved for the transactions occurring after the finalization. This may explain the difficulty of establishing a robust nonlinear structure of the T/R - $PREM$ relationship. Furthermore, different countries have implemented limitations on

interest deductibility at different times and to different extents, which may further contribute to the findings being more suggestive than conclusive.

Moreover, while the initial U-shape of the curve seems counterintuitive, induced by the negative values in the *T/R* sample data, the explanation might lie within the *T/R* definition. As the Compustat definition of the total income taxes variable includes deferred taxes (defined as current year's deferrals less the amortization of prior year's deferrals), a possible explanation of the negative value is that sample companies have had higher amortization of prior tax deferrals than the current year's deferrals. This is intuitively in line with higher premiums as the target firm is effectively deleveraging itself from old tax liabilities, reducing its future tax burdens. The possible non-linear relationship stemming from this may therefore be another reason for the insignificance of the variable, further enforced by the significance of the polynomial term.

5.1. Limitations

A primary limitation of our study is the relatively small sample size of 62 firms. The Nordic PTP LBO market is smaller compared to that of larger economies like the US, which inherently limits the number of transactions available for analysis. The smaller sample may reflect specific characteristics of the sampled firms rather than universal trends, which restricts the extent to which our findings can be generalized to the broader population of PTP LBOs. The smaller sample may fail to identify significant relationships that exist due to the increase in possible type II errors. The specific characteristics of the sampled firms may also include outliers which disproportionately skew the findings of the small dataset than it would a large dataset. Although we have employed winsorization to mitigate the impact of these outliers, the residual effects may remain.

The small sample size also affected the diversity of PTP transactions we were able to analyse. Our study treats all PTP LBO transactions as a homogenous group, without distinguishing between different types such as management buyouts (MBOs), institutional buyouts (IBOs), or management buy-ins (MBIs). The incentive and agency problems vary across the transaction types, seen in section 2.2.6. especially in the incentive re-alignment theory, which focuses on incumbent management's prioritization of personal gain in MBOs. Furthermore, there may be a variation in post-buyout performance in regards to the different transaction

types. An example given in Renneboog (2007) is that MBOs might involve lower premiums due to management's insider advantage while IBOs could involve higher premiums as external acquirers compete and rely on public information.

Despite the robustness of our model, omitted variable bias remains a concern as 68% of the variance in *PREM* remains unexplained. When it comes to our robustness tests, while observing larger explanatory value with the spline and cubic polynomial models for *T/R*, there is a risk of overfitting due to the limited sample size and the addition of higher-order terms. Moreover, the observed U-shape for *T/R* described in section 5 may align with the restricted tax benefit theories, however, the nonlinearity may also result from data-specific characteristics or unmeasured factors. If nonlinearity is the case, the OLS linear regression model may not be the most appropriate model for explaining the wealth gains made by pre-buyout shareholders. Future studies with a larger dataset and more detailed tax breakdowns could support or challenge this interpretation.

6. Conclusion

This study examines which factors explain the premiums paid to pre-buyout shareholders in public-to-private leveraged buyouts in Nordic countries from 2000 to 2023. Overall, our model offers a moderately good explanation of the factors that explain acquisition premiums. The model is found to be significant and presents a higher R-squared and adjusted R-squared than the benchmark study we built our method upon. However, more than 68% of the variability in acquisition premiums remains unexplained by the current model. The results of our study provide significant support for the undervaluation, free cash flow, and bidder competition hypotheses which is consistent with previous literature done in the US. These results hold for several robustness tests at significant levels. Following the widespread implementation of Action 4 of the OECD Base Erosion and Profit Shifting project finalized in 2015, the findings may suggest that high pre-buyout tax levels may follow a nonlinear relationship with premiums. This may indicate the decline of high tax benefits in leveraged buyouts. The role of monitoring by blockholders is also suggested to have a smaller effect in the Nordics which may be due to a governance culture which emphasizes active ownership control rather than institutional control which is the case for the US.

6.1. Suggestions for future research

While we believe that this study makes a valuable contribution to the understanding of acquisition premiums in PTP LBOs, specifically in the Nordic region, there are several avenues for future research that would strengthen our understanding of the topic. Our model leaves a substantial portion (over 68%) of the variability unexplained. This suggests that there are various additional factors influencing acquisition premiums that were not captured by our analysis.

As we believe that the sample size is the most apparent limitation in our study, it would be interesting to perform this study at a later period in time where the sample size would be able to be expanded. Otherwise, we would also suggest studies encompassing additional (or all) European countries in order to grow the dataset. The larger datasets would allow differentiating between various types of PTP transactions (MBOs, MBIs, IBOs), each of which may exhibit distinct dynamics which may influence the buyout premiums.

We would be particularly interested in future research focusing on the consequences of the tax benefits in regards to the restrictions on interest deductions in leveraged buyouts. Specifically, it would be interesting to dive deeper into the relationship between tax related benefits and premiums after interest deductibility has been restricted, to determine whether tax benefits are still a driving factor in acquisition premiums.

We would also find it interesting to see qualitative studies with a more in-depth exploration of specific firms performed on this specific topic. We would be interested in a qualitative study that focuses specifically on the blockholder hypothesis, as it may be influenced significantly by the context of the situation. We have an indication that the culture of active ownership control in the Nordics may be the reason for the smaller effect of this variable than in the US or UK. Conducting case studies of individual firms may result in a more holistic understanding of the underlying cultural and contextual differences that may affect corporate governance between the different regions and how this affects acquisition premiums.

A promising direction for future research is the examination of post-buyout performance to determine which hypotheses or variables of the anticipated value are realized after the firm

has gone private. Longitudinal studies tracking the performance of acquired firms over time would offer insights into the effectiveness of PTP LBOs in enhancing shareholder value. This would not only justify the premiums paid but also identify the specific factors that contribute to successful value creation post-buyout. From these insights, we may be able to get a more nuanced understanding of why premiums are paid and in what types of situations they are realized.

The landscape of European LBOs is rapidly evolving, with an increasing number of transactions taking place in recent years. Given that few European or Nordic PTP LBOs were listed in the past relative to the US, the current surge presents an opportunity to analyze these differences. We are in agreement with the literature in that there still seems to be a lack of research with the regional scope of the European market when it comes to public-to-private leveraged buyouts. Further research examining this topic, especially differences between Europe and US or UK PTP LBOs, seems necessary in order to bridge the research gap and deepen our understanding of the factors that drive acquisition premiums in public-to-private leveraged buyouts across different regional contexts.

References

- Amihud, Y. (1989). *Leveraged Management Buyouts*. Washington, D.C.: Beard Books.
- Andres, C., Betzer, A. and Weir, C. (2007). Shareholder wealth gains through better corporate governance - The case of European LBO-transactions. *Swiss Society for Financial Market Research*.
- Argentum.no. (2023). *The state of Nordic private equity 2023*. [online] Available at: <https://info.argentum.no/stateofnordicpe2023/sec/9#report-top>.
- Axelson, U., Jenkinson, T., Strömberg, P. and Weisbach, M.S. (2013). Borrow Cheap, Buy High? The Determinants of Leverage and Pricing in Buyouts. *The Journal of Finance*, 68(6), pp.2223–2267.
- Bergström, C., Grubb, M. and Jonsson, S. (2007). The Operating Impact of Buyouts in Sweden. *The Journal of Private Equity*, 11(1), pp.22–39.
- Boucly, Q., Sraer, D. and Thesmar, D. (2011). Growth LBOs. *Journal of Financial Economics*, 102(2), pp.432–453.
- Burnett, C. (2019). Interest deductibility: implementation of BEPS Action 4 and the future of transfer pricing of intragroup finance. *Bulletin for International Taxation*, 73(6/7), pp.325–331.
- Campa, J.M. and Hernando, I. (2004). Shareholder Value Creation in European M&As. *European Financial Management*, 10(1), pp.47–81.
- DeAngelo, H., DeAngelo, L. and Rice, E.M. (1984). Going Private: Minority Freezeouts and Stockholder Wealth. *The Journal of Law and Economics*, 27(2), pp.367–401.
- DeAngelo, L.E. (1986). Accounting Numbers as Market Valuation Substitutes: A Study of Management Buyouts of Public Stockholders. *The Accounting Review*, 61(3), pp.400–420.
- Dietz, D. (2015). The Price of Control. Master Dissertation at The University of North Carolina.
- Easterbrook, F.H. and Fischel, D.R. (1983). Voting in Corporate Law. *The Journal of Law & Economics*, 26(2), pp.395–427.
- Easterwood, J.C., Singer, R.F., Seth, A. and Lang, D.F. (1994). Controlling the Conflict of Interest in Management Buyouts. *The Review of Economics and Statistics*, 76(3), pp.512–522.
- Goergen, M. and Renneboog, L. (2004). Shareholder Wealth Effects of European Domestic and Cross-border Takeover Bids. *European Financial Management*, 10(1), pp.9–45.
- Grossman, S.J. and Hart, O.D. (1980). Takeover Bids, The Free-Rider Problem, and the Theory of the Corporation. *The Bell Journal of Economics*, 11(1), p.42.

- Grossman, S.J. and Hart, O.D. (1988). One share-one vote and the market for corporate control. *Journal of Financial Economics*, 20, pp.175–202.
- Guo, S., Hotchkiss, E.S. and Song, W. (2011). Do Buyouts (Still) Create Value? *The Journal of Finance*, 66(2), pp.479–517.
- Halpern, P., Kieschnick, R. and Rotenberg, W. (1999). On the Heterogeneity of Leveraged Going Private Transactions. *Review of Financial Studies*, 12(2), pp.281–309.
- Harlow, W.V. and Howe, J.S. (1993). Leveraged Buyouts and Insider Nontrading. *Financial Management*, 22(1), p.109.
- Investing in Sweden: Private Equity Activity 2023 Fundraising, Investments and Divestments. (n.d.). Swedish Private Equity & Venture Capital Association.
- Jensen, M.C. (1986). Agency cost of free cash flow, corporate finance, and takeovers. *The American Economic Review*, 76(2), pp.323–329.
- Jensen, M.C. (1989). Eclipse of the Public Corporation. *Harvard Business Review*. (Sept.-Oct. 1989), revised 1997.
- Jensen, M.C. and Meckling, W.H. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*, 3(4), pp.305–360.
- Kaplan, S. (1989a). The effects of management buyouts on operating performance and value. *Journal of Financial Economics*, 24(2), pp.217–254.
- Kaplan, S.N. (1989b). Management Buyouts: Evidence on Taxes as a Source of Value. *The Journal of Finance*, 44(3), pp.611–632.
- Kaplan, S.N. (1997). The Evolution of U.S. Corporate Governance: We Are All Henry Kravis Now. *The Journal of Private Equity*, 1(1), pp.7–14.
- Kaplan, S.N. and Strömberg, P. (2009). Leveraged Buyouts and Private Equity. *Journal of Economic Perspectives*, 23(1).
- Kieschnick, Jr, R.L. (1998). Free Cash Flow and Stockholder Gains in Going Private Transactions Revisited. *Journal of Business Finance Accounting*, 25(1&2), pp.187–202.
- Lehn, K., Netter, J. and Poulsen, A. (1990). Consolidating corporate control. *Journal of Financial Economics*, 27(2), pp.557–580.
- Lehn, K. and Poulsen, A. (1989). Free Cash Flow and Stockholder Gains in Going Private Transactions. *The Journal of Finance*, 44(3), pp.771–787.
- Limiting Base Erosion Involving Interest Deductions and Other Financial Payments, Action 4 - 2015 Final Report. (2015). *OECD/G20 Base Erosion and Profit Shifting Project*. OECD. doi:<https://doi.org/10.1787/9789264241176-en>.
- Lowenstein, L. (1985). Management Buyouts. *Columbia Law Review*, 85(4), pp.730–784.

- Mehran, H. and Peristiani, S. (2009). Financial Visibility and the Decision to Go Private. *Review of Financial Studies*, 23(2), pp.519–547.
- Michel, A. and Shaked, I. (1986). *Takeover Madness: Corporate America Fights Back*. John Wiley & Sons.
- Moeller, S.B., Schlingemann, F.P. and Stulz, R.M. (2004). Firm Size and the Gains from Acquisitions. *Journal of Financial Economics*, 73(2), pp.201–228.
- Opler, T. and Titman, S. (1993). The Determinants of Leveraged Buyout Activity: Free Cash Flow vs. Financial Distress Costs. *The Journal of Finance*, 48(5), pp.1985–1999.
- Per Lekvall, Gilson, R.J. and Jesper Lau Hansen (2014). *The Nordic corporate governance model*. Stockholm: Sns.
- Renneboog, L., Simons, T. and Wright, M. (2007). Why do public firms go private in the UK? The impact of private equity investors, incentive realignment and undervaluation. *Journal of Corporate Finance*, 13(4), pp.591–628.
- Renneboog, L. and Vansteenkiste, C. (2017). Leveraged Buyouts: A Survey of the Literature. *SSRN Electronic Journal*, CentER Paper Discussion Series No. 2017-015.
- Schadler, F.P. and Karns, J.E. (1990). The unethical exploitation of shareholders in management buyout transactions. *Journal of Business Ethics*, 9(7), pp.595–602.
- Schwert, G. William. (1996). Markup pricing in mergers and acquisitions. *Journal of Financial Economics*, 41(2), pp.153–192.
- Shleifer, A. and Summers, L.H. (1987). Breach of Trust in Hostile Takeovers. *National Bureau of Economic Research*.
- Singh, H. (1990). Management Buyouts: Distinguishing Characteristics and Operating Changes Prior to Public Offering. *Strategic Management Journal*, 11(Special Issue: Corporate Entrepreneurship (Summer, 1990)), pp.111–129.
- Swedish Private Equity & Venture Capital Association. (2023). *Investing in Sweden: Private Equity Activity 2023*.
- Thakor, A.V. (2015). The Financial Crisis of 2007–2009: Why Did It Happen and What Did We Learn? *Review of Corporate Finance Studies*, 4(2), pp.155–205.
- Toms, S. and Wright, M. (2005). Divergence and Convergence within Anglo-American Corporate Governance Systems: Evidence from the US and UK, 1950–2000. *Business History*, 47(2), pp.267–295.
- Verick, S. and Islam, I. (2010). *The Great Recession of 2008-2009: Causes, Consequences and Policy Responses*. Geneva: Ilo.
- Weinstein, M.I. (1983). Bond Systematic Risk and the Option Pricing Model. *The Journal of Finance*, 38(5), pp.1415–1429.

Weir, C., Laing, D. and Wright, M. (2005). Incentive Effects, Monitoring Mechanisms and the Market for Corporate Control: An Analysis of the Factors Affecting Public to Private Transactions in the UK. *Journal of Business Finance Accounting*, 32(5-6), pp.909–943.

Appendix

Appendix 1: Correlation Matrix

	TPR	D/E	MEXR	FCF	INBH	COBH	IFBH	BICO	SIZE	FICR
T/R	1.00									
D/E	-0.05	1.00								
MEXR	0.05	0.09	1.00							
FCF	-0.04	-0.01	0.31	1.00						
INBH	-0.02	0.06	0.09	0.02	1.00					
COBH	-0.06	-0.02	0.12	0.15	0.09	1.00				
IFBH	-0.07	0.26	0.27	-0.04	0.35	0.04	1.00			
BICO	-0.03	-0.15	-0.13	-0.09	0.09	0.04	-0.14	1.00		
SIZE	0.03	0.22	0.06	0.36	-0.10	0.10	0.01	0.24	1.00	
FICR	-0.07	0.07	-0.05	-0.04	0.12	-0.09	0.28	-0.09	0.03	1.00

Appendix 2: VIF test

Variable	VIF
T/R	1.142945
D/E	1.261594
MEXR	1.290982
FCF	1.408957
INBH	1.274629
COBH	1.052792
IFBH	1.426324
BICO	1.229771
SIZE	1.391616
FICR	1.155912

Appendix 3: t-test of coefficients - HC1

	Coefficient estimate	Standard error	t-value	p-value	Significance
Intercept	0.4768	0.7956	5.9931	<0.001	***
T/R	2.8602	2.1023	1.3605	0.1797	
D/E	0.0280	0.0332	0.8455	0.4018	
MEXR	-0.2312	0.0918	-2.5193	0.0149	**
FCF	0.0218	0.0089	2.5337	0.0144	**
INBH (1=yes)	-0.0691	0.0510	-1.3552	0.1813	
COBH (1=yes)	-0.0523	0.0533	-0.9827	0.3304	
IFBH (1=yes)	0.0836	0.0795	1.0504	0.2985	
BICO (1=yes)	0.2058	0.0513	4.0078	0.0002	***
SIZE	-0.0584	0.0156	-3.7468	0.0005	***
FICR (1=yes)	0.5568	0.1149	4.8462	<0.001	***

*** p<0.01, ** p<0.05, * p<0.1

Appendix 4: t-test of coefficients - Clustered standard errors by firm

	Coefficient estimate	Standard error	t-value	p-value	Significance
Intercept	0.4749328	0.0788836	6.0207	1.90e-07	***
T/R	2.9745266	2.0433552	1.4557	0.1516022	
D/E	0.0269465	0.0313854	0.8586	0.3945958	
MEXR	-0.2247767	0.0870634	-2.5818	0.0127462	**
FCF	0.0215608	0.0083404	2.5851	0.0126378	**
INBH (1=yes)	-0.0697138	0.0503449	-1.3847	0.1721657	
COBH (1=yes)	-0.0493551	0.0521405	-0.9466	0.3483166	
IFBH (1=yes)	0.0816096	0.0758772	1.0755	0.2871912	
BICO (1=yes)	0.2072755	0.0502114	4.1281	0.0001356	***
SIZE	-0.0586321	0.0153352	-3.8234	0.0003597	***
FICR (1=yes)	0.5567736	0.1148893	4.8462	1.22e-05	***

*** p<0.01, ** p<0.05, * p<0.1

Appendix 5: GAM – Parametric Coefficients & Approximate significance of smooth terms

	Coefficient estimate	Standard error	t-value	p-value	Significance
Intercept	0.3528	0.0373	9.468	<0.001	***
INBH (1=yes)	-0.0211	0.0529	-0.3980	0.6930	
COBH (1=yes)	-0.0714	0.0516	-1.3820	0.1740	
IFBH (1=yes)	0.0521	0.0731	0.7120	0.4800	
FICR (1=yes)	0.0899	0.2164	0.4160	0.6800	

	edf	Ref. df	F	p-value	Significance
s(T/R)	4.4180	5.2410	3.554	0.0082	***
s(D/E)	2.1360	2.6030	3.8370	0.0215	**
s(MEXR)	1.0000	1.0000	4.0320	0.0507	*
s(FCF)	1.0000	1.0000	2.050	0.1592	
s(SIZE)	3.6130	4.4790	2.7590	0.0353	*

*** p<0.01, ** p<0.05, * p<0.1

Adjusted R-squared	0.414
Deviance explained	0.569
GCV	0.042272
Scale estimated	0.030567
n	62

Appendix 6: Splines model

	Coefficient estimate	Standard error	t-value	p-value	Significance
Intercept	0.617768	0.111598	5.536	1.20e-06	***
bs(T/R, degree = 3)1	-0.607047	0.232102	-2.615	0.011812	**
bs(T/R, degree = 3)2	0.035667	0.179378	0.199	0.843214	
bs(T/R, degree = 3)3	-0.068944	0.115149	-0.599	0.552107	
D/E	-0.004429	0.00649	-0.682	0.498202	
MEXR	-0.220237	0.07675	-2.87	0.006051	***
FCF	0.026226	0.009779	2.682	0.009946	***
INBH (1=yes)	-0.019526	0.052866	-0.369	0.713462	
COBH (1=yes)	-0.065646	0.049976	-1.314	0.195121	
IFBH (1=yes)	0.117433	0.071272	1.648	0.105819	
BICO (1=yes)	0.221327	0.053523	4.135	0.000138	***
SIZE	-0.047536	0.016919	-2.81	0.007107	***
FICR (1=yes)	0.303088	0.210756	1.438	0.156763	

*** p<0.01, ** p<0.05, * p<0.1

Residual standard error	0.1779 (49 degrees of freedom)
Multiple R-squared	0.513
Adjusted R-squared	0.3937
F-statistic	4.301
p-value	0.0001244

Appendix 7: Polynomial model

	CoefficientStandard				
	estimate	error	t-value	p-value	Significance
Intercept	0.450458	0.094098	4.787	1.60e-05	***
poly(T/R, 3)1	0.251153	0.188023	1.336	0.187801	
poly(T/R, 3)2	0.546105	0.22104	2.471	0.017015	**
poly(T/R, 3)3	-0.366341	0.192193	-1.906	0.06251	*
D/E	0.037589	0.028582	1.315	0.194588	
MEXR	-0.210486	0.076115	-2.765	0.007994	***
FCF	0.027247	0.009584	2.854	0.006317	***
INBH (1=yes)	-0.037158	0.05186	-0.716	0.477085	
COBH (1=yes)	-0.064784	0.049344	-1.313	0.195326	
IFBH (1=yes)	0.109212	0.070237	1.555	0.126384	
BICO (1=yes)	0.215587	0.053035	4.065	0.000173	***
SIZE	-0.053437	0.017052	-3.134	0.002913	***
FICR (1=yes)	0.296902	0.20741	1.431	0.158642	

*** p<0.01, ** p<0.05, * p<0.1

Residual standard error	0.1756 (49 degrees of freedom)
Multiple R-squared	0.5251
Adjusted R-squared	0.4088
F-statistic	4.515
p-value	7.466e-05

Appendix 8: OLS regression for premiums in PTP transactions – No winsorization of *PREM*

	Coefficient estimate	Standard error	t-value	p-value	Significance
Intercept	0.47213	0.1192	3.961	0.000232	***
T/R	2.70163	2.38267	1.134	0.262152	
D/E	0.03567	0.03538	1.008	0.318045	
MEXR	-0.25646	0.09452	-2.713	0.00906	***
FCF	0.02571	0.01037	2.479	0.016508	**
INBH (1=yes)	-0.07957	0.06291	-1.265	0.211684	
COBH (1=yes)	-0.06147	0.06103	-1.007	0.318555	
IFBH (1=yes)	0.0947	0.08692	1.09	0.281026	
BICO (1=yes)	0.2125	0.06596	3.222	0.00222	***
SIZE	-0.05995	0.02086	-2.874	0.005894	***
FICR (1=yes)	2.29296	0.23729	9.663	4.09e-13	***

*** p<0.01, ** p<0.05, * p<0.1

Residual standard error	0.2189 (51 degrees of freedom)
Multiple R-squared	0.7189
Adjusted R-squared	0.6638
F-statistic	13.04
p-value	6.387e-11

Appendix 9: OLS regression for premiums in PTP transactions – $\ln(PREM)$

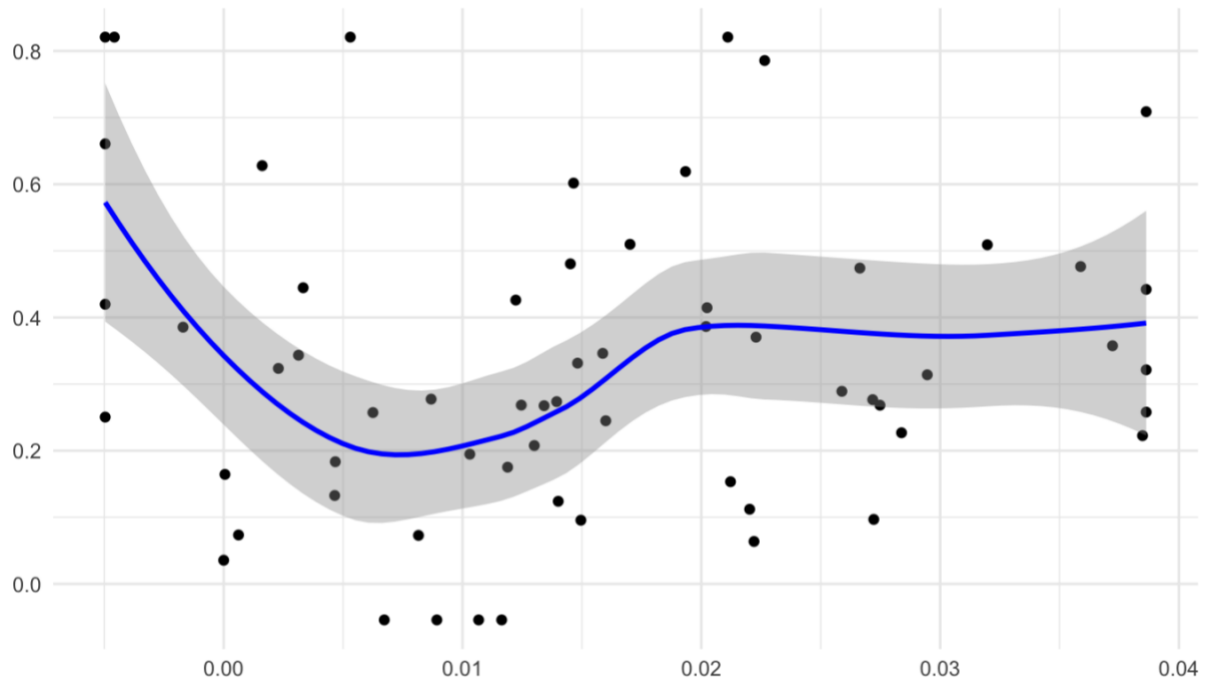
	Coefficient estimate	Standard error	t-value	p-value	Significance
Intercept	0.367058	0.090049	4.076	0.00016	***
T/R	2.585034	1.800042	1.436	0.15708	
D/E	0.028235	0.026726	1.056	0.29573	
MEXR	-0.174214	0.071405	-2.44	0.01821	**
FCF	0.020096	0.007834	2.565	0.0133	*
INBH (1=yes)	-0.064705	0.047526	-1.361	0.17935	
COBH (1=yes)	-0.041834	0.046103	-0.907	0.36846	
IFBH (1=yes)	0.07657	0.065663	1.166	0.249	
BICO (1=yes)	0.169507	0.049827	3.402	0.00131	***
SIZE	-0.046323	0.015759	-2.94	0.00493	***
FICR (1=yes)	1.06036	0.179264	5.915	2.79e-07	***
Residual standard error	0.1654 (51 degrees of freedom)				
Multiple R-squared	0.5541				
Adjusted R-squared	0.4667				
F-statistic	6.337				
p-value	3.1e-06				

Appendix 10: OLS regression for premiums in PTP transactions – Excluding observation 54

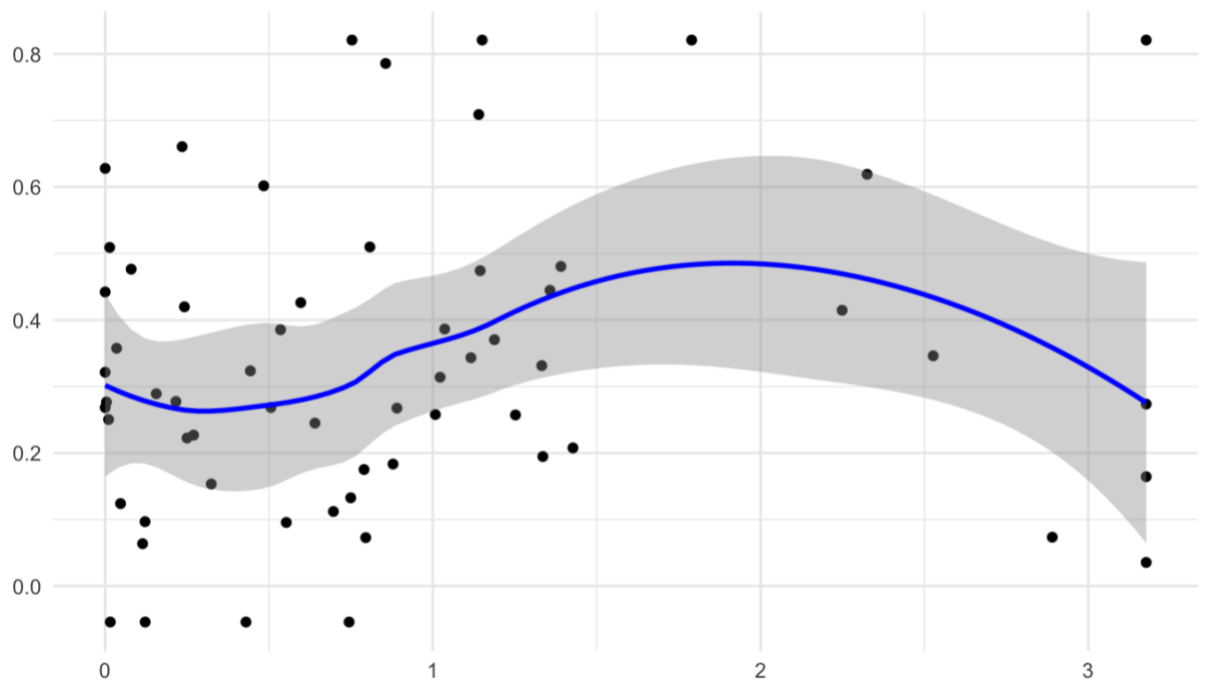
	Coefficient estimate	Standard error	t-value	p-value	Significance
Intercept	0.474933	0.100692	4.717	1.90e-05	***
T/R	2.974527	2.017718	1.474	0.146573	
D/E	0.026947	0.029779	0.905	0.369778	
MEXR	-0.224777	0.079578	-2.825	0.006739	***
FCF	0.021561	0.008754	2.463	0.017196	**
INBH (1=yes)	-0.069714	0.05311	-1.313	0.195188	
COBH (1=yes)	-0.049355	0.051526	-0.958	0.34265	
IFBH (1=yes)	0.08161	0.073407	1.112	0.271463	
BICO (1=yes)	0.207275	0.055679	3.723	0.000493	***
SIZE	-0.058632	0.01761	-3.329	0.001622	***
FICR (1=yes)	N/A	N/A	N/A	N/A	

Residual standard error	0.1848 (51 degrees of freedom)
Multiple R-squared	0.3885
Adjusted R-squared	0.2805
F-statistic	3.6
p-value	0.001566

Appendix 11: Scatter Plot with LOESS Smoothing – $x=T/R$, $y=PREM$



Appendix 12: Scatter Plot with LOESS Smoothing – $x=D/E$, $y=PREM$



Appendix 13: Descriptive statistics – Total income taxes

	Mean	Median	Std.dev	Max	Min
<u>Income taxes</u>					
Current	6.0051	2.2225	10.7459	44.3060	-9.2410
Deferred	-0.4083	-0.031	7.0473	35.7403	-24.1598
Other	0.9705	0.0000	4.8215	32.8303	-0.5488

Appendix 14: Breusch-Pagan test

BP	10.398
df	10
p-value	0.4063

Appendix 15: RESET test

RESET	3.144
df	49
p.value	0.5192

Appendix 16: AI use

Bachelor thesis students are permitted to use generative AI tools provided they disclose their usage in line with the Stockholm School of Economics Disciplinary Regulations. We used OpenAI's ChatGPT in the assistance of RStudio coding and troubleshooting errors. We also used ChatGPT in order to make grammatical corrections and give us feedback on the structure. We have also used Quillbot in order to make sure that we have not plagiarized or used AI produced content.

Although AI may enhance efficiency, it carries risks related to information accuracy which we are aware of. AI was not used to create new content or analysis. AI can also provide non-relevant or inaccurate feedback. Therefore, we have been critical in evaluating the feedback we have been given, thereby only incorporating AI if we believe that it is valid and relevant.

AI tools improved efficiency and helped with the language of coding. Furthermore, it has the ability to give feedback and with critical supervision from humans it may have the ability to make us see other perspectives at times.