Minority Discount in Publicly Traded Firms

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Abstract
This paper examines the minority discount due to lack of control by looking at tender offer premiums on Swedish publicly traded firms from 2007 to 2018. We analyze how ownership structure, the acquired stake and distribution of shares affect the minority discount. Variables focusing on control of shares are tested individually but also included in models addressing additional impacts. Our findings suggest that a bidder’s ownership of the target firm prior to the announcement lowers the bidder’s valuation of the remaining shares. However, the relation between premium and ownership seem to depend on a threshold of having a toehold which justifies the argument of toeholds attaining control and influence of the target firm. Correspondingly, the premium per share increases with the partial interest acquired, suggesting a non pro-rata valuation. We find no evidence of additional premium for minority shareholders in squeeze out events. However, equally powerful blockholders in target firms tend to increase bid premiums, arguably due to increased competition which aligns bid premium valuation to the valuation of control between dual class shares.

Keywords: Minority discounts, Control premiums, Tender offers, Toeholds, Takeovers, Minority interests, Lack of control
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1. Introduction

1.1 Background

There are several ways of gaining control in a potential target firm and placing a tender offer is one of them. A corporate takeover is one of the largest investments a firm can make (Betton, Ecko and Thorburn, 2008). In order to convince shareholders of the target firm to accept the tender offer, the bidder usually offers a premium. As we show, the bid premiums over the past economic cycle have varied substantially from being negative to valuing the company to the double or even more.

During 2016, the U.S.-based pharmaceutical company Mylan made a public offer on the Swedish pharmaceutical company MEDA AB with a substantial premium of 80%. In contrast, during 2018, the Swedish investment company Melker Schörling AB received an offer from the main owners of merely 5% premium. The difference in premiums raises questions over the impact of the control aspect. The offer for Melker Schörling AB was tendered from the existing majority shareholders targeting the minority owners of the firm while the offer on MEDA AB came from a bidder without ownership. MEDA AB and Melker Schörling AB are two examples from our sample showing how ownership structure of the target firm may affect the valuation.

Few subjects in applied corporate finance generate as much practitioner debate as the valuation of minority claims (Bates, Lemmon and Linck, 2006). The treatment of minority shareholders have been discussed both from a legal and economic perspective. Meanwhile, since minority shareholders lack control of the firm, Damodaran (2005) argues that they should correspondingly be compensated with a discount. The minority discount is expressed as the price difference between a minority and a majority position which is evidently exposed in tender offer transactions when bidders seek control (Pratt, 2009).

Acquisitions usually take place in times of economic recovery and rapid credit expansion which fuels the stock market (Martynova and Renneboog, 2008). Financial Times reported the highest nominal value of global takeover activity ever in the first quarter of 2018, exceeding the previous high watermark from 2007 (Platt, Espinoza and Weinland, 2018). The fast growing activity of mergers and acquisitions (M&A) demonstrates the relevance within the field of research.
In the history of M&A, it is clear that these transactions come in waves (Betton, Eckbo and Thorburn, 2008). Acquisitions can be triggered by regulatory, political and technological changes and have repeatedly spiked during early 1900s, 1920s, 1960s, 1980s and the 1990s (Betton, Eckbo and Thorburn, 2008). Takeovers can create synergies and bid announcements tend to boost stock prices which usually benefit the target firm’s minority and majority shareholders (Betton, Eckbo and Thorburn, 2008). The shareholders of the target firm value their shares to the current market price which the bidder knows for certain the shareholder will not sell below (Roll, 1986). Additionally, the offered premium should reflect the potential synergies of the two firms (Hayward and Hambrick, 1997).

However, there are other aspects associated with takeovers and premiums for control from the bidder’s point of view. Roll (1986), Hayward and Hambrick (1997) basically point to CEO hubris when explaining the premium paid for a certain stake in a company. Meanwhile, Long and Walkling (1984) view tender offers as the ideal setting when analyzing agency problem of type I between managers and owners. Likewise, Jensen (1986) argues that there are agency problems involved with transactions for boosting the operating performance. Firms with excessive cash managed by self-interest managers tend to exploit the opportunity in order to pursue empire building, rather than distributing the funds through dividends (Martynova and Renneboog, 2008).

On the other hand, the premium for control can also be analyzed by looking at agency problems in the target firm. The potential replacement of management in the target firm is primarily what affects the size of the premium (Damodaran, 2005). Thus, agency costs between shareholders and management could be a potential cause of a larger premium. This argumentation connects both types of agency problems to the premiums paid. The acknowledgement of firms with excess cash destroying value by overbidding on target companies, sparkles interesting questions of the accuracy of these premiums and what they refer to (Martynova and Renneboog, 2008).

Kraakman (1988) states three seemingly simplistic reasons for why acquirers pay a higher price than the stock market share price. Firstly, the acquirer may have more valuable use for the assets, leading to synergies. Secondly, current share price is undervalued. Finally, bidders simply pay too much. There is evidently a premium paid for acquiring a controlling position of a company. In order to capitalize the benefits of control in a firm, an investor must have substantial portion of shares. A controlling minority position of 5-50% in the target firm, often
referred to as a toehold, may reduce the premium paid in acquisitions (Betton, Eckbo and Thorburn, 2009).

Whether the price of the tender offer is the fair value ought mainly to be considered by the affiliates of both the target firm and the bidder. When studying the market capitalization based on share price prior to the announcement of a tender offer, there should be a disparity as Kraakman (1988) claims. In this situation, the main difference in valuation is the premium of a tender offer which is paid for the entire firm. The difference is often referred to as the premium for control which is presumably dependent on a majority position (Damodaran, 2005). Furthermore, a majority position allows consolidation and tender offers may therefore have a required level of acceptance known as conditional offers (Betton, Eckbo and Thorburn, 2009).

As Schweihs (2010) argues, one share of a firm does not necessarily represent the overall value of the firm, equal to a pro-rata allocation. A majority owner has the authority to make decisions on its own. A minority interest in a firm does not possess any power within the company and may suffer from lack of control. Hence, the value of a minority interest is likely worth less than the pro-rata fraction of the whole value of the firm.

Nonetheless, control can be priced by a market. Shares with different voting rights allow investors to purchase shares with additional control but with the same right to cash flow. The spread between shares with different voting rights reflects the value of control (Rydqvist, 1996). Arguably, this would reflect the minority discount of an individual share. As more shares and voting rights imply increased control, the premium would increase with the size of the acquired stake. Correspondingly, the minority discount would decrease with the fraction of shares acquired. In comparison, Damodaran (2005) claims that minority discount is only applied if the investor does not gain substantial control.

Earlier research of overpaid premiums from the bidder’s perspective, addressing empire building have received attention (Nenova, 2003). However, we intend to address the minority investor’s perspective by focusing on the control of target firms prior to the tender offers. When looking at the bid premium from a minority investor’s perspective, the tender offer is reflecting the new, fair value of the entire firm including value of control. Thus, there are two ways of looking at the same phenomena; what drives the premium for control and what drives the discount?
1.2 Problem discussion

Betton, Eckbo and Thorburn (2009) claim that the fair market value is unknown until the whole firm is auctioned. A common used method when valuing a firm is to measure the discounted cash flows, where the focus is on pricing value per share without additional value addressing the control of the firm (Penman, 1998; Petersen and Plenborg, 2009). Accordingly, there is a constant relationship between the value per share and quantity of shares, implying that each share is worth equally as much. Thus, there would be valuation gaps between aggregated value of shares and the value of control appearing from holding substantial amounts. Furthermore, as more shares equals more control, certain thresholds enables contractual possibilities. The control component would arguably also be addressed and is critical when addressing the fair value of a firm (Damodaran, 2005).

At the same time as there is a premium for controlling more shares, there would correspondingly be a discount for not controlling a significant portion of shares (Booth, 2001). Bid premium corresponds to what the acquirer pays in extent of the market price. An accepted tender offer becomes the new fair value of the firm according to auction theory (Rydqvist, 1996). The ultimate minority discount an investor may obtain due to lack of control is when acquiring a single share, as it carries least control (Pratt, 2009). The discount is the percentage reduction of the market value prior to the announcement in relation to the tender offer (Pratt, 2009). While the control premium originates from the market value, the minority discount originates from the tender offer. In a tender offer, the control premium and the minority discount has the same nominal value. Hence, the minority discount is the inverted premium (Pratt, 2009).

The minority expropriation should be a motive for potential minority discount as different rights are priced by the market. Sweden is known for its high degree of separation of ownership through dual class shares, cross-holdings and pyramid structures (La Porta et al., 1998). Furthermore, La Porta et al. (1999) found that Sweden has a dysfunctional corporate governance structure due to shareholder disparity and scored among the worst in a study of the world 27th richest countries. Minority shareholders however benefit from strong legal protection and social norms which reduce the benefit of control. Countries with weak extra legal protection and corporate governance tend to have lower market valuations and higher benefits of control, which should be captured by the premiums (Holmén and Knopf, 2004). This makes Sweden an interesting country to investigate the premium phenomenon or conversely, the minority discount.
Earlier research seem to focus on either bid premiums or dual class shares estimating value of control. This point to a potential research gap where the alleged premium for control in acquisitions from Nenova (2003) and Eckbo (2009) could be put in relation to the value of control in dual class shares from Rydqvist (1996). This paper aims to supplement by comparing and unite the two views of control premium. Our focus is set on the minority discount which is the value of control from the perspective of a minority shareholder which may be of value for a larger group of investors (Pratt, 2009). Celli (2017) states that the theoretical and empirical contributions on the subject of minority discount is very limited, while research addressing related matters is very much common.

1.3 Research question and purpose
We seek to explore how the minority discount varies in different contexts as we evaluate contributing factors to this phenomenon. The field of study is interesting from a minority investor’s point of view but also from a theoretical perspective of agency problems. Bates, Lemmon and Linck (2006) argue that minority claims are especially important when the controlling shareholders seek to buy out the minorities which has a practical implication. It is hard for the related parties to estimate the pricing of minority shares in negotiations which is why forced redemptions are processed in court (Bates, Lemmon and Linck, 2006). A rational minority investor interested in cash flow rather than control, may seek investment opportunities with maximal minority discount, as a free rider. Correspondingly, an investor looking for control should consider the expected value of control for which a premium is paid. This paper aims to answer the research question of how the minority discount due to lack of control applies on publicly traded firms.

This paper evaluates the discount due to lack of control (DLOC) or conversely, premium for control on publicly traded firms while focusing on the control aspects through the ownership structure. The framework is constructed on the foundations of earlier research methods. We strive to add a level of depth and review the earlier research. Furthermore, since Sweden is recognized of concentrated ownership structures, the Swedish stock market is especially interesting for studying the minority discount. Earlier research is reviewed from a different perspective highlighting the control aspects and thereby broadening the perspective of the phenomena. This paper investigates the pricing of a minority position that would inflict the
value of control by looking at tender offers. Moreover, book value of jointly owned companies may be viewed differently as the value of numerous voting rights may imply a value in extent to the pro rata share value.

The outline of the paper has the structure as follows. A literature review presented in section 2, evaluating earlier research of value of control, discounts and ownership. Section 3 presents the data collection and constructed models addressing the control premium based on the literature review. Our variables addressing the value of control are tested in section 4 through univariate, bivariate and multivariate analyses, ending with applying the minority discount on firm valuation. Section 5 concludes the paper.
2. Literature review

2.1 Acquiring control

Acquiring a controlling position of a company may not be as easy as buying a small fraction on the stock market. An investor may have several alternatives when planning to acquire a firm depending on the desired size and control. Single shares can be obtained directly on the stock market by placing a bid on the lowest ask price in the order book and thereby hopefully not paying a premium for the acquired shares (Bris, 2002). Trades on the open market are profitable for an acquirer since it allows the firm to buy a portion of the target relatively cheaper given that the market do not acknowledge the bidder’s intention of placing a tender offer (Eckbo, 2009). However, a revealed intention of acquiring the target firm can lead to stock price run-ups which makes a potential acquisition more expensive (Betton and Eckbo, 2000). Furthermore, the open market is not an alternative as long as all outstanding shares are not available in the order book.

A bid of all outstanding shares would naturally raise the price of the last traded share due to an increased demand, when considering a liberal stock market and disregarding regulation. Hence, the difference in price per share between purchasing one stock and purchasing all outstanding shares indicates the minority discount (Damodaran, 2008; Pratt, 2009; Schweih, 2010). If the purchase leads to a dominant position within the company, this value should be priced into the pro-rata value of the company’s capital, hence the control premium (Celli, 2017). In addition, Akhigbe, Martin and Whyte (2007) show that full acquisitions of firms tend to have larger premiums than partial in accordance with the argumentation of Roll (1986).

Damodaran (2005) examines the underlying aspects of the control premium and argues that value of control derives from being able to run the firm in another regime and thereby doing it better than the current management. The value of control will be less for well managed companies and greater for poorly managed firms (Damodaran, 2005). Also, the expected value of control depend on the likelihood of management change. The expected value of control is low when the probability of management change is low. Hence, strong incumbent management restricts the value of control by the absence of agency problem type I. Managers of target firms face many incentives to resistance, including potential wealth changes and unemployment (Long and Walking, 1984). In addition, management who reject a tender offer can easily defend
their judgement blaming an unfair price (Long and Walking, 1984). Vice versa, shareholders of the bidder have incentives to change poorly performing firms with inefficient management. These are attractive targets for bidders who estimate a larger potential value. Long and Walking (1984) argue that agency problem type I is a significant cost in tender offer transactions. Agency conflicts between the shareholders and the managers are in many cases substantial in tender offers activities since shareholder wealth maximization are not fully aligned with managerial interest (Jensen and Meckling, 1976). As mentioned, this can be an issue in both the acquiring and target firm.

Agency problems are in many countries not between managers and shareholders, but rather between controlling minority shareholders and non-controlling shareholders (Cronqvist and Nilsson, 2003). Moreover, Damodaran (2005) mention three mechanisms for management change. Firstly, institutional investors who aim to improve the corporate governance of a firm. The second mechanism is a proxy contest in which multiple minority investors can get representation on the board by gathering enough shareholder proxies to win a corporate vote and thereby change management policies. A minority investor with a toehold, defined as an influential ownership stake by another firm, may replace the board through a proxy contest or by replacing the management committee (DeAngelo and DeAngelo, 1989; Dodd and Warner, 1983). Lastly, the third mechanism is to replace existing managers with more competent managers who will run the firm in a more favorable and profitable manner. In contrary, there are also mechanisms which hinder investors to affect incumbent managers, regardless of a managers lack of skill, which protects managers from shareholder’s pressure (Damodaran, 2005). These mechanisms include anti-takeover amendments to corporate charter, cross-holding structures and shares of different voting rights. Agency problems tend to be greater in publicly traded firms compared with privately held firms, potentially due to a more concentrated ownership (Povel and Sertios, 2014).

2.2 Premiums and discounts

There is a relationship between a firm valuation and the probability of a firm being acquired through a tender offer. The underlying argument is that a target firm with a low valuation may be perceived as being undervalued (Schwartz, 1982; Palepu, 1986; Song and Walking, 1993). Moreover, a high market valuation may indicate significant growth prospects for the potential target firm (Akhigbe, Martin, and Whyte, 2007). Since the bid premium may be affected by the
control aspect among other variables, the valuation may therefore be important to study when looking at the minority discount through control premium.

However, there are some arguments against the minority discount and control premiums which are worth mentioning. Damodaran (2005) claims that the control aspect is already reflected in the market price whereby small bid premiums in fact indicate a higher level of control premium already are priced in the market. Moreover, Booth (2001) argues that it is not clear whether minority shareholders should receive any discount at all. The ownership of shareholders are legally equal pro-rata to the outstanding shares of the same class. The fact that they have less control should therefore not imply any discount in relation to other shares and thereby receive a pro-rata share of the firm’s value. In addition, Damodaran (2005) questions the use of acquisition premium in the estimation of control. Accordingly, the acquisition premium should be addressed not only to the value of control but also to synergy and overpayment. However, the definition of control premium by Damodaran (2005) is defined as the additional value between the value of the current firm and the value by running the firm more efficiently.

Rydqvist (1996) on the other hand captures the premium for control as the difference between dual-class shares and formulates a model for estimating the bid rivalry effect on control premiums. While focusing on bidding mechanism of tender offerings, Rydqvist (1996) merely focus on the valuation difference between A and B-shares as a source of valuing control. Typically, examining the dual-class share system of Sweden would thereby contribute to a how an open market appraises the control, leading to a greater accuracy for a minority discount. Rydqvist (1996) breaks down the component of the spread between dual class shares in Sweden as a control premium depending on the excessive control of the largest blockholder relative the second largest blockholder. The focus indicates more accuracy of the spread between share classes, than tender offers. Additionally, no certain degree of the bid premium seems to be addressed to the aspect of control in bid premium where this also can be valid.

2.3 Minority discount

The phrase minority discount is frequently discussed in private equity and from a juridical perspective when negotiating a forced redemption (Kraakman, 1988). This implies another perspective when looking at the tender offer price. Perhaps a perspective which is more
applicable for an investor who is not paying the actual premium and not looking for control. After all, it should only be the acquirer that pays a premium over the current market price.

When studying the minority shareholders, Bates, Lemmon and Linck (2006) separated their analysis between two theories regarding minority squeeze outs. The first theory is based on the assumption that minority shareholders lack board influence or sufficient legal means, allowing for controlling shareholders to capture a significant part of the gains in such acquisition. The second theory assumes a minority bargaining power in the sense of board representation with legal resources in order to mitigate the controlling shareholders effect. Interestingly, Bates, Lemmon and Linck (2006) find that minority claimants receive almost 11% more in squeeze out transactions than their pro rata share of deal surplus generated by the bid announcement, which is inconsistent with the situations where controlling shareholders deliberately undertake squeeze outs at the expense of the minority shareholders. Nonetheless, such premium can be explained by the bidder’s way of avoiding transaction costs associated with a legal case.

Schweihs (2010) describes adjustments which are commonly used when valuing a minority position of closely held firms. A minority discount is the discount due to the lack of control and influence of the governance and it should not be confused with the discount deriving from the lack of marketability or liquidity. The two main discount adjustments are due to lack of control (DLOC) and for lack of marketability (DLOM). These two components refers to a combined discount and is also used in private company valuation (CFA Institute, 2018; Damodaran, 2005). A collective component among finance literature is that DLOC is defined as the inverted control premium (Pratt, 2009; Schweihs, 2010; CFA Institute, 2018). Thus, a measured control premium on a public firm can thereby be converted to a minority discount. The DLOM includes liquidity discount for which a given interest cannot be sold for at a fair value within a reasonable period of time (Buchner, 2016). Hence, DLOM tend to diminish as firms go public as showed by Pratt and Schweihs (1999). A firm with a concentrated ownership structure and less outstanding shares have an impact on the shares marketability and the shareholder should therefore be compensated with a discount (Booth, 2001). Furthermore, there could be a recognizable valuation component referring to the specific marketplace on which the stock is listed. Reilly and Schweihs (1999) measures the expected DLOM when comparing value multiples of firms prior and after firms are listed. Supposedly, the marketability discount would decrease the with a more recognizable marketplace. With this in mind, the DLOM would arguably be of minor concern when studying publicly traded firms.
There are also discounts mentioned by Schweih (2010), apart from DLOC and DLOM. The remaining discounts can be categorized into discount related to transferability restrictions and those of which related to non-systematic risk (Schweih, 2010). Moreover, Schweih (2010) discuss the discounts for both public and private, closely held firms. Thus, the reasoning and methodology of Schweih (2010) align both private and public firms without questioning the applicability on either one. Most of the evidence of DLOC and DLOM found by valuation analysts are based on publicly traded common equity securities transactions and control rights are an important aspect and impact the value of the firm. In summary, the discount related to the lack of control or conversely, the premium for control, depends on the shareholder’s ability to exercise its control. (Schweih, 2010)

As we are interested in DLOC specifically which is derived from the bid premium and the focus is not to investigate the discount due to lack of marketability. However, the DLOM should be considered as a part of the minority discount. When studying public firms, the DLOM should theoretically be neglected as all observations are marketable. The logic of this presumption comes from Reilly and Schweih (1999). Naturally, there should be thoughts concerning levels of marketability which should be effected by the marketplace with its liquidity. Reilly and Schweih (1999) measured value multiples of companies before and after their initial public offerings suggesting a difference.

2.4 Pre-bid ownership and toehold
The control premium with a standing point of toehold ownership have been found examined by Betton, Eckbo and Thorburn (2009). Toeholds in target firms are either defined as long term investments or positions for strategic bidding purposes and defined with a 5-50% ownership. The effect of toeholds are evaluated as to whether it affects the bid premium. Furthermore, Povel and Sertios (2014) mainly see toeholds as a starting position taken while considering a full takeover offer. However, they may also be used to monitor a contractual counterparty or to strengthen customer-supplier relationships (Povel and Sertios, 2014). Povel and Sertios (2014) argue that toeholds are less important when there is a greater group of potential bidders. However, even if the bidder does not win the competition, the investor is able to sell the partial stake to a relatively higher price as proven by Eckbo (2009). Nevertheless, the intention to
acquire the target is more likely revealed which is the cost of the toehold and such cost is relevant for the market when there is an anticipation for battle of control (Bris, 2002).

A toehold acquisition on a target firm may induce influence on the target’s management and have a positive effect on the management and board’s decisions making in value-maximizing policies (Fama, 1980; Fama and Jensen, 1983). On the one hand, the probability of a bid competition and target firm resistance is reduced with greater toeholds. Such bids are associated with lower pre-bid target stock price run-ups and lower bid premiums (Betton and Eckbo, 2000). On the other hand, an initial high bid premium signals that the bidder has a high valuation (Giammarino and Heinkel, 1986; Fishman, 1988). Moreover, Betton and Eckbo (2000) and Eckbo (2009) argue that the toehold lowers the number of remaining shares the bidder must purchase at a costly premium. Another interesting finding by Bukart (1995), is that he found that bidders with a zero toehold pay their own valuation, while bidders with a positive toehold always overbid due to a stock price runup when the intention of an acquisition is detected by the market. Hence, the optimal toehold may in some cases be zero while in other cases be substantial when the market is uncertain whether transfer of control is going to take place or not (Bris, 2002)

Hirshleifer and Titman (1990) notice a negative relation between toehold size and bid premium with the reasoning that the target shareholder’s bargaining power decreases with the proportion of the toehold in the takeover stage. With that being said, Betton, Eckbo and Thorburn (2009) perhaps strive more towards bidding strategies and returns from the view of the bidder. The toeholds of bidders should point to a relation between the existing ownership and the premium which the acquirer will have to pay when seeking further control in the target firm. This premium is substantially exposed when owners with toeholds place tender offers. The relation indicate how the bidder’s toehold affects the bid premium which in turn displays the minority discount. This measure will be guiding towards deriving a minority discount. Hence, the multivariate analysis including toehold ownership as shown by Betton, Eckbo and Thorburn (2009) can be seen as a base for this study.

One of the reasons why investors may consider toehold acquisitions is because of its contribution to value enhancing control transfers (Choi, 1991). Transfer of control can take place through internal mechanism, management turnovers and proxy fights and not only through takeovers and such transfer are more likely in target firms which are subject to toeholds
(Choi, 1991). Furthermore, Hirshleifer and Titman (1990) found that a large initial ownership holding and the ability of diluting minority shareholders increase the chance of completing a tender offer. Moreover, Hirshleifer and Titman (1990) also find that overbidding may not be a successful strategy since it signals a higher post takeover value due to asymmetric information. This highlights the complexity of corporate takeovers and further stress that the same strategy may not be applicable in every situation. Betton and Eckbo (2000) find that a greater pre-bid ownership is associated with lower pre-bid target stock price runups and lower bid premiums. The expected payoff to target shareholders decreases in the bidder’s toehold and increases in the probability of competition and in the bid premium. Nonetheless, even though a pre-bid ownership stake brings positive effects for the bidder, Betton and Eckbo (2000) find that only half of the initial bidders acquire toeholds. Additionally, Povel and Sertios (2014) state that toeholds are 27% on average and are held for a reasonable long time. Among toeholds, 75% are held for at least 8 months pre-acquisition. In contrary, empirical evidence by Stulz and Walking (1990), Bradley, Desai and Kim (1988), Betton and Eckbo (2000) and Jennings and Mazzeo (1993) show that bidders tend to have low toeholds, less than 5%.

Pre-announcement ownership benefits the acquiring firm since it strengthens customer and supplier relationship, management influence and may help mitigate the agency problems involved in tender offer transactions (Povel and Sertios, 2014). Hence, it should be noted that a toehold gives the opportunity to make a better judgement whether acquiring the whole firm is a good strategic decision and not the obligation to do so. Even though there are a lot of arguments stressing the positive effects of having a toehold prior to a tender offer, Such pre ownership contributes to a relatively higher premium in tender offer transactions (Jennings and Mazzeo, 1993; Schwert, 1996; Goldman and Qian, 2005). Again, this shed light on the complexity of the Merger and Acquisition field and the control transfer aspect associated with tender offers which makes it even more interesting to study.
<table>
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<th>Study</th>
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<tr>
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<td>Rydqvist (1996)</td>
<td>The voting premium can be defined as the spread between the two largest blockholders.</td>
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<td>Schweihs (2010); Pratt (2009)</td>
<td>Minority discount = 1 − 1/(1+Control premium)</td>
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<td>Schweihs (2010)</td>
<td>Minority discount = Discount due to lack of control + Discount due to lack of marketability</td>
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3. Methodology

3.1 Data

Data of acquisitions are collected from Eikon and Finansinspektionen and the data consist of public tender offers registered by Thomson Reuters Eikon. We limit our data of observations ranging between January 15, 2007 to February 8, 2018. The time period is equivalents to approximately eleven years including the financial crisis of 2008. As Martynova and Renneboog (2008) argues, increased M&A activity historically occurs in times of booming economy. These transactions come in waves, arguably not depending much on nominal years but rather on the economic cycle. The time range is intended to capture necessary observations that contributes to forming the result of a full economic cycle. By including the economic growth of 2007 followed by the recession of 2008, the observations are expected to become more representative over time. Furthermore, the data of press releases become less retrievable further back in time which is another reason of why the analyses are limited back to 2007. Nevertheless, since tender offers tend to come in waves, each cycle of corporate takeovers could potentially be different.

The observations include targets listed on Nasdaq Stockholm, First North, Aktietorget and Nordic Growth Market. Data from Thomson Reuters Eikon does not only include public tender offers but also acquisitions of partial interests which typically are controlling positions, transferred from one owner to another. Moreover, the data collected includes but is not limited to public announcement for each transaction. Only press releases including an announced tender offer are evaluated and listed in our sample. Hence, we can verify that these bids were public and have been communicated to the market and Finansinspektionen. Also, every observed transaction is confirmed with at least one additional press release in order to ensure the reliability of the disclosed information. The collected data is processed with information of the target, acquirer, price, deal size, acquired stake, value multiples, press releases and pre-announcement ownership in order to identify the tender offers.

Dual listings might have an effect on the marketability aspect and may therefore not capture the essence of our targeted lists. Companies registered abroad or mainly traded on other venues other than our targeted lists are identified and removed from the remaining observations. The
following companies are excluded due to dual listings and foreign currency: Metro International SA, Dockwise Ltd, Alliance co LTD, Norwegian Car carrier ASA and SaniTec Abp.

Same company may occur more than once in the sample. In case of bid rivalry, there are at least two observations, one observation for each bidder. Only the highest offer from each separate bidder is taken into account since we have no specific interest in the bidding competition process. Hence, the observations capture the highest potential valuation for each bidder and duplicate offers from the same bidders are removed. The latest offer from each bidder, which also refers to the highest offer in each contest is selected. The remaining sample consists of 175 tender offers including mandatory and competitive bids.

Data of ownership stakes are retrieved from disclosures about the acquirer’s holdings. The processed information is in each case either issued by the bidding firm, the target or Thomson Reuters Eikon. In some cases, the bidder acquires a stake concurrent to the offer. The acquired stake is considered as part of the tender offer only if it is acquired to the same price. The classification of the data is in accordance with Betton and Eckbo (2000) and Eckbo (2009).

Data of the difference between the two largest shareholders in each target is collected from Uppsala University database. We use quarterly data and aim to be as close as possible to the day prior to the announcement. The data of blockholders amounts to 140 observations with a total of 560 shareholders. We include the difference between the largest blockholders derived by Rydqvist (1996). As the targets may have dual class shares, largest owners of both voting rights and cash flow rights are collected. The rationale of measuring the shareholder spread is to evaluate the share distribution and its impact on the minority discount through the premium. Moreover, voting premium depend on the ownership and share distribution and the premium decreases with the proportion of voting shares. Rydqvist (1996) argues that the voting premium of dual class shares is large when ownership is dispersed or in a situation of two large minority blockholders with equal ownership size. Conversely, the voting premium is small when there is one large blockholder which controls the majority of the voting rights. Hence, a connection and comparison between the minority discount can also be recognized as the input variables derived from research of control.

The free float of each target is collected from Datastream, the day prior to the announcement. The data is available for 142 observations. The free float is a measure of stock liquidity and it
excludes stocks held by strategic stockholders, such as government and corporations which have been considered (Chakarbarti, 2005). The liquidity aspect will be controlled for, by measuring the free float of each stock prior to the bid announcement.

Value multiples referring to tender offers retrieved from Thomson Reuters Eikon include key figures of income measures in relation to enterprise value (EV). Thomson Reuters Eikon defines enterprise value as the sum of market capitalization, total debt, and minority interest less cash and cash equivalent. The profitability metrics used are earnings before interest and tax (EBIT) and earnings before interest and tax depreciation and amortization (EBITDA). Moreover, sales (S) are also included. The reported figures are based on the sum of the four latest quarterly reports prior to the tender offer.

Premiums are derived from the communicated price per share of the tender offer, denoted as $P_{\text{Tender offer per share}}$, in relation to market price per share prior to the announcement. The market price prior to the announcement is evaluated by calculating the volume weighted average price, $VWAP_{1\text{ Month}}$ for each firm for one month prior to the announcement date. The volume weighted price reflects the average price of the shares that have been traded during the period which is a widely used benchmark (Cartea and Jaimungal, 2016). Furthermore, since $VWAP_{1\text{ Month}}$ includes the liquidity aspect in terms of traded volume, it may reduce the potential discount due to lack of marketability which may affect the minority discount (Schweihs, 2009). In comparison, Eckbo (2009) questions the use of cumulative abnormal return as a proxy for premiums as the cumulative abnormal return also reflects the probability of competition and bid failure.

The Control premium for a given company have a defined relation to the minority discount. The relation stated by Pratt (2009) calculates the Control premium and the minority discount as followed:

$$Control\ premiuim = \frac{P_{\text{Tender offer per share}}}{VWAP_{1\text{ Month}}} - 1$$  \hspace{1cm} (1)

$$1 - \frac{1}{1+\text{Control premium}} = \text{Minority discount}$$  \hspace{1cm} (2)
3.2 Multivariate analysis

The method is based on Betton, Eckbo and Thorburn (2008) who use multiple regression analysis to evaluate toeholds in bid negotiations. We look at the Control premium as the dependent variable since it has a direct positive relation to the minority discount. The analytical models will guide towards application of minority discount in different ownership structures by looking at the premium. Shares of the target firm is used as a proxy for control. Moreover, a robustness test is pursued in order to test our models and variables.

The intercept is denoted as $\alpha$. The four independent variables are Pre-ownership, Acquired, $(V_1-V_2)$ and $(H_1-H_2)$. Pre-ownership is the bidder’s fractional ownership of the target firm prior to the announcement. Acquired is the fraction of outstanding shares that is acquired in the acquisition. The percentage of outstanding shares of largest and second to largest blockholders are presented as $H_1$ and $H_2$. $V_1$ is the variable measuring the voting percentage of largest blockholder and $V_2$ is the voting percentage of second largest blockholder. The nominal value of the completed tender offer transaction in USD million is denoted as Deal size. The percentage of total outstanding shares in issue to ordinary investors is presented as Free float which is defined as total shares less strategic holdings in relation to the shares outstanding. Dummy variables are denoted Mandatory and Competitive which explain mandatory offer and bidding contents, respectively. The residual is denoted as the error term $\varepsilon$.

The analysis is performed by testing the first hypothesis that bidder’s Pre-ownership has an impact on the Control premium. The results display how the percentage of capital owned impacts the tender offer and moreover, the premium. Hereby, we aim to describe the minority discount as a function of ownership structure and share accessibility through the bidder’s pre-announcement ownership of the target.

$$
Control\; premium = \alpha + \beta_1(Pre-ownership) + \beta_2(Deal\; Size) + \beta_3(Free\; float) + \beta_4(Mandatory) + \beta_5(Competitive) + \varepsilon
$$

(3)

Initially, the independent variable, Pre-ownership is individually tested in order to estimate the effect disregarding the control variables. Additionally, the control variables included are added in order to isolate the effect of ownership.
Moreover, the second hypothesis claims that the premium increases with the percentage of acquired shares. The variable *Acquired* is tested both independently and with control and dummy variables.

\[
\text{Control premium} = \alpha + \beta_1(\text{Acquired}) + \beta_2(\text{Deal Size}) + \beta_3(\text{Free float}) + \beta_4(\text{Mandatory}) + \beta_5(\text{Competitive}) + \epsilon
\]

(4)

The competition may arguably be captured by the spread between the two largest blockholders. The spread between the two largest holder of voting rights undertakes the third hypothesis that the spread between blockholders have a negative effect on *Control premium*. Furthermore, the measure also captures how dominant the largest blockholder is. A mandatory bid is arguably more likely to occur where there is a dominant owner and where the spread is substantial. Furthermore, the *Free float* is arguably decimated when there is one large holder of shares which limits shares available for trading. Hence, the dummy variables and the free float are removed when including spread between blockholders.

\[
\text{Control premium} = \alpha + \beta_1(\text{Acquired}) + \beta_2(V_1-V_2) + \beta_3(\text{Deal size}) + \epsilon
\]

(5)

Shares with different voting rights are common in Sweden which adds another important aspect to test in order to measure the *Control premium*. While the third hypothesis reflects the blockholders measured in voting rights, the fourth hypothesis suggests that the spread between the two largest holders of outstanding shares have a negative impact on the *Control premium*.

\[
\text{Control premium} = \alpha + \beta_1(\text{Acquired}) + \beta_2(H_1-H_2) + \beta_3(\text{Deal size}) + \epsilon
\]

(6)

Value multiples *EV/EBIT*, *EV/EBITDA* and *EV/Sales* are denoted as *Value multiple*, respectively, in pursuance of a comparison between profitability valuation, valuation of control and minority discounts.

\[
\text{Control premium} = \alpha + \beta_1(\text{Value multiple}) + \epsilon
\]

(7)

The model includes only positive *EV/EBIT* and *EV/EBITDA* as the multiples have the inverted valuation effect when firms make losses. The closer the value multiples approach zero, the lower the valuation. Thus, when firms do not make profits, lower and further negative ratios
imply higher instead of lower valuation. As all observations have positive sales, the $EV/S$ can be used as an alternative measure.

The regression models separate $Pre-ownership$ and $Acquired$ due to the risk of having two variables explaining the same aspect. The bidder can only acquire the amount of percentage which it does not already own. In the case of a completed acquisition preceded by a toehold in the target company, the maximum percentage is 100 less the current toehold, explaining the relation between $Pre-ownership$ and $Acquired$. Thus, in several cases the factor of acquired stake in percentage is equal to a hundred less the toehold. Hence, these observations covariate which disrupts the level of significance of these individual factors.

Mandatory tender offers are identified and treated with a dummy variable. These offers are enforced and can therefore be placed without the intention of acquiring the whole firm. However, there is also a risk of undermining the sample by removing all mandatory tender offers as they may appear to be no different than non-mandatory bid. Swedish law requires an acquirer to place a mandatory tender offer after reaching control of 30 or 50% of the voting rights (Lag (2006:451) om offentliga uppköpserbjudanden på aktiemarknaden, 2006). Naturally, if the acquirer does not want to control more shares, the mandatory offer can be tendered below the market value. Thus, it can be questioned whether such a tender offer accounts for the fair value of the firm. Mandatory offers are commonly noted with negative bid premiums which can cause skewness in relation to the remaining observations.

Damodaran (2005) states that the minority discount is not to be applied equally in different firms. Rather, the aspect of control should be individually reflected and valued in each firm respectively. Thereby, an average discount for control would arguably not draw the whole picture of the phenomenon but rather an indication of how the discount applies in the general case. Hence, our method strives to describe the minority discount with independent variables aiming to capture the control of shares in the target firm. Although, there are other factors implying control beyond controlling shares including board membership. According to Damodaran (2005) our results would simply indicate how well the control factor is priced into the stock before the announcement. Based on this argument the premium would point to a constant mispricing in the market when fully priced control aspect of a targets would have zero premium.
4. Results

4.1 Data distribution

Control premium is treated as the dependent variable affected by independent variables throughout the analysis. We identified 27 Mandatory offers and 9 Competitive bids. In our sample, 96 out of the 175 tender offers were conditioned requiring control of 50% of the shares or more. The measurement of share ownership is divided in percentage of voting rights and outstanding shares, separately. The mean spread between largest and second largest owner of outstanding shares and voting rights is 12,62% and 14,03% respectively, indicating shareholder disparity between holdings of voting rights and shares. The average pre-announcement ownership in shares range between 0 to 93,28% with an average of 16,96% based on 175 observations. Moreover, the acquired stake have a mean value of 55,09% but with a standard deviation of 41,34%. Premiums based on VWAP for one month range from -38,12% to 257,51% which indicates a wide distribution of premium observations and the mean premium is 34,64%. Table 2 reports descriptive analysis. The fluctuating premiums expressed in standard deviation corroborates what Damodaran (2005) claims about the individualized minority discount of each firm. Thus, it is perhaps not reasonable to expect a substantial premium in every case.

Table 2
The table presents descriptive data of our sample and consist of 175 tender offer which is our base sample on Swedish publicly traded firms ranging from 2007 to 2018.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Minimum</th>
<th>Maximum</th>
<th>Mean</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control premium (%)</td>
<td>175</td>
<td>-38,12</td>
<td>257,51</td>
<td>34,64</td>
<td>41,42</td>
</tr>
<tr>
<td>Conditional offer</td>
<td>96</td>
<td>50,00</td>
<td>90,00</td>
<td>86,61</td>
<td>9,75</td>
</tr>
<tr>
<td>Pre-ownership</td>
<td>175</td>
<td>0</td>
<td>93,28</td>
<td>16,96</td>
<td>23,40</td>
</tr>
<tr>
<td>H1 - H2 (%)</td>
<td>140</td>
<td>0</td>
<td>57,32</td>
<td>12,62</td>
<td>12,69</td>
</tr>
<tr>
<td>V1 - V2 (%)</td>
<td>140</td>
<td>0</td>
<td>86,57</td>
<td>14,03</td>
<td>13,96</td>
</tr>
<tr>
<td>Acquired stake (%)</td>
<td>175</td>
<td>0</td>
<td>100,00</td>
<td>55,09</td>
<td>41,34</td>
</tr>
<tr>
<td>Mandatory</td>
<td>27</td>
<td>0</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Competitive</td>
<td>9</td>
<td>0</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

In a first step to investigate the aspect of control, we study the advantage of an ownership stake including toeholds before placing a tender offer. The premium compared with ownership prior to tender offer is reviewed in Fig. 1. The bidder’s ownership indicates a negative relation with the premium illustrated by the trend line.
At first glance, the allocation of ownership seem to be in line with the arguments of Betton and Eckbo (2000) regarding toeholds affecting premiums negatively. The rationale behind it is that ownership prior to the announcement contributes to value enhancing control transfers which can take place through management turnovers, internal mechanism and proxy fights (Choi, 1991). The observations seem to be scattered with a concentration of premiums below 50%. Only 10 of the observations have an estimated premium of 100% and above. Among all, the three highest premiums were offered to Wayfinder Systems AB, ReadSoft AB and Guld Invest Norden AB respectively, where the highest offered premium is 258%. ReadSoft AB received two offers coming from two different bidders, where the bidder with the lower offer had a toehold of 5.3%. Neither of the bidders on Wayfinder systems nor Guld Invest Norden had a toehold of the target company.

Among the 175 observations of our sample, there are 75 with an ownership stake of 5% or more. Thus the median ownership stake of all observations is 0 and the median of ownership over 5% is 34.9%. The average ownership of all 175 observations is 38.06% and 39.49% when adjusting for ownership less than 5%. The distribution of mean values are listed in Table 3.
Table 3
This table represents the distribution of ownership prior to announcement among bidders. The sample consists of 175 tender offers from the exhibited period. The levels of ownership are presented in the form of distribution along with mean values for each interval. The intervals are formed after Finansinspektionens requirement in notification of changes in major shareholdings (Lag (1991:980) om handel med finansiella instrument Svensk författningssamling 1991:980, 1991). Accordingly, at least 5% of outstanding shares or voting rights are required in order to have influence of the firm.

<table>
<thead>
<tr>
<th>Bidder’s ownership (%)</th>
<th>Number of observations</th>
<th>Mean control premium (%)</th>
<th>Mean minority discount (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>H &lt; 5</td>
<td>100</td>
<td>43,77</td>
<td>30,44</td>
</tr>
<tr>
<td>5 ≤ H &lt; 10</td>
<td>5</td>
<td>83,94</td>
<td>45,63</td>
</tr>
<tr>
<td>10 ≤ H &lt; 15</td>
<td>3</td>
<td>25,98</td>
<td>20,62</td>
</tr>
<tr>
<td>15 ≤ H &lt; 20</td>
<td>4</td>
<td>23,82</td>
<td>19,24</td>
</tr>
<tr>
<td>20 ≤ H &lt; 25</td>
<td>5</td>
<td>27,85</td>
<td>21,78</td>
</tr>
<tr>
<td>25 ≤ H &lt; 30</td>
<td>8</td>
<td>16,55</td>
<td>14,2</td>
</tr>
<tr>
<td>30 ≤ H &lt; 50</td>
<td>26</td>
<td>20,81</td>
<td>17,23</td>
</tr>
<tr>
<td>50 ≤ H &lt; 66,67</td>
<td>17</td>
<td>8,43</td>
<td>7,78</td>
</tr>
<tr>
<td>66,67 ≤ H &lt; 90</td>
<td>5</td>
<td>15,15</td>
<td>13,16</td>
</tr>
<tr>
<td>90 ≤ H &lt; 100</td>
<td>2</td>
<td>29,85</td>
<td>22,99</td>
</tr>
</tbody>
</table>

Since 100 of 175 observations consist of less than 5% ownership, the high noted premiums do not influence the mean value as much as it would do in the remaining intervals. The large amount of acquisitions without toeholds can be motivated by Bukart (1995) who argues that there are costs associated with toeholds which is stock price run-ups if the intention of making a tender offer is detected by the market. As a consequence of the amount of toeholds, the highest mean premium is found with a toehold of 5 to < 10%. We find that the number of observations were greatest in an ownership of less than 5%. It is more common not to have an ownership prior to making a tender offer despite the negative relationship between a toehold and a bid premium, which is stressed by Betton and Eckbo (2000), Stulz and Walking (1990), Bradley, Desai and Kim (1998), Jennings and Mazzeo (1993) and Choi (1991).

Still, Damodaran (2005), Fama (1980) and Fama and Jensen (1983) argue that many benefits can be attributed from a Pre-ownership, such as having a greater influence of the firm from a control point of view which gives the opportunity to encourage shareholder value maximizing behavior. Also, having a greater toehold of the target reduces the number of shares which have to be bought later at a costly premium, in order to complete the tender offer (Betton and Eckbo, 2000; Eckbo, 2009).
Based on our observations from Table 3, the optimal toehold seem to appear in the interval of $25 \leq H < 30$. In contrast, Betton, Eckbo and Thorburn claim that the optimal toehold is either 0 or above 9% but Bris (2002) found that there are strong evidence pointing towards a positive relationship between a bidder’s toehold and profits (Bukart, 1995; Singh, 1998). It should be noted that the intervals of our sample have a low amount of observations. Apart from where ownership is non-existent, the amount of observations are few which limits the ability to draw conclusions.

The distribution of intervals indicate a nonlinear relation between ownership and premium. The peak is found at $5 \leq H < 10$ with a solid drop to a bottom of $50 \leq H < 66,67$, before the average premium rises when ownership head towards 100%. There seem to be a substantial difference in bid premiums between the intervals $30 \leq H < 50$ and $50 \leq H < 66,67$ where the control premium drops to 8,43 from 20,81, a difference of 12,38%. The only time when control premium and minority discount detracts to single digits are when ownership is 50 to below 66,7%. This is an interval in which the target firm can be consolidated and mandatory offers are enforced which may affect the results. The fact that the control premium and minority discount rise at intervals above 66,67% could indicate a squeeze out premium to minority shareholders offered by firms controlling more than 66,67%. The indication can be supported by the arguments of Bates, Lemmon and Linck (2006).

The notion of the bid premium or conversely, the minority discount seem to be greater in the interval of 90-100% is explained by Bates, Lemmon and Linck (2006) with the rationale of a minority squeeze out. Bidders are compensating the minority shareholders in order to avoid transaction costs associated with indirect and direct expense of a legal challenge (Bates, Lemmon and Linck, 2006). This would explain the deviating premium in the upper ownership level of 90 to 100% section and such squeeze-outs are costly for the bidder, Bates, Lemmon and Linck (2006) argue that minorities in such situations receive as much as 11% more than their pro-rata share of deal surplus. The aforementioned is one example of the compensation the minorities receive due to their lack of control and influence of the corporate action.

To further test the squeeze-out effect, a simple linear regression is applied in our sample. Binary indicator of 1 notes ownership intervals of 50% or more, indicating that the firm can be consolidated with the majority owner. The remaining intervals containing ownership above
zero are denoted with 0. By performing a regression with the 77 observations, the results show a negative effect on the premium by displaying a $t$-value of -1.804, with no signs of a positive squeeze-out effect. The indication does not support the finding of Bates, Lemmon and Linck (2006), who argues that minority shareholders get substantial premiums in squeeze-out transactions.

Furthermore, a regression analysis is performed containing intervals over 50% only, using ownership as independent variable and premium as dependent. However, problem arise when there are only 24 observations, which limit the ability to draw any conclusions from such a small sample. Nevertheless, the constant is positive with a $p$-value of 0.322 suggesting higher premium as ownership increases. Thus, we cannot state that the squeeze out has an effect on the premium and this test points in the opposite direction compared to the previous regression of squeeze out, making the squeeze out effect on minority discount seem ambiguous and unclear.

Two $t$-tests are also performed in order to compare the three intervals $30 \leq H < 50$ and $66.67 \leq H < 90$ to $50 \leq H < 66.67$ separately. Neither of the results from these tests end up yielding a significant result with $t$-values of 1.42 and -0.63 respectively. Thus, neither of the changes in mean premiums between the three middle intervals are significantly different from each other.

Another way of framing the value of control is by looking at the bidder’s Acquired stake of the target firm in the event of a tender offer. The interpretation of the relationship between the two variables is that greater pro rata premiums have to be paid in order to get a greater stake or control in the firm, including the compensation to minority shareholders. This indicates that minorities receive a minority discount when acquiring relatively smaller stakes which could be an expression of DLOC (Schweihs, 2010). Fig. 2 shows the observations of accomplished transactions and the premium paid. The largest premiums are found when companies acquire the whole firm in one tender offer. The distribution seem to mirror Fig. 1 of Pre-ownership which indicates correspondence between Pre-ownership and Acquired stake. In contrast to Pre-ownership, the variable Acquired takes no consideration to the already owned stake. Hence, the variable makes no difference between the first and the last acquired percent.
Fig. 2. The control premium and acquired stake in percentage of outstanding shares based on 123 tender offers on publicly traded firms between 2007-2018. Tender offers with acquired stakes of 0 are excluded.

The distribution of the third independent variable, the spread between blockholders is shown in Fig. 3. It should be noted that $(H_1 - H_2)$ does not consider whether it is the bidder’s ownership is one of these blockholders. The variable considers the ownership distribution of the target firm by measuring the two largest blockholders.
Fig. 3. The control premium and spread between the largest and second largest blockholder measured in numbers of outstanding shares. The sample is based on a of 140 tender offers on Swedish publicly traded targets between 2007-2018.

The sample indicates larger premiums are paid in transactions where the two largest shareholders have a similar size of ownership in the target firm, in accordance with the arguments of Rydqvist (1996). This indicates that target firms with a small difference between the largest and second largest blockholders should be associated with higher premiums and in other words, a relatively larger minority discount. Thus, in lack of a dominant owner, the premium for control will likely increase. Potentially, when there are many owners of approximately the same size, there are likely to be more owners who wish to attain control and the competition of those will likely increase (Rydqvist, 1996). In this case, a minority stake in the company with several equal owners have a larger opportunity to influence compared to a company with one dominant owner. Thus, a minority stake in a company with several equal owners where there is competition would be more desirable and be attributed with a premium. In contrast, with one dominant owner, the same stake of a minority position is not as powerful in relation to the largest owner and the premium for control may therefore be lower.

4.2 Bivariate analysis of ownership prior to the announcement

In order to further analyze whether the ownership structure have a substantial impact on the Control premium, we run bivariate analyses without control variables. The four models in Table
4 each consist of one variable and an intercept. All variables represent a measure connected to ownership structure and furthermore control.

Throughout the simple linear regressions, the intercepts remain strongly significant. The intercept displays the expected premium with the independent variable at zero. The estimates are based on the 175 and 140 observations respectively of our sample. All four of the models indicate a positive premium, irrespective of the variable used for measuring control. Neither of the models have a particular high Adj. R². It is not surprising since time as a dimension is not considered in panel data. Moreover, the low Adj. R² indicates that there should be more factors behind the offered premium. A low Adj. R² is to be expected as we estimate discounts due to lack of control which in theory is only a part of the minority discount. As Damodaran (2005) proposes, it is more likely that the ability to create wealth from changes in management would ascertain the premium.

Table 4

Bivariate analysis.

This table shows 4 models where the dependent variable is the Control premium. The base sample consists of 175 observations including Pre-ownership from 0 to less than 100%. All 175 tender offers are included regardless of their deal status. The first column illustrate the bidder’s ownership stake prior to the announcement of the tender offer. The second column illustrates the Acquired stake in percentage. The third column outlines the voting spread between the largest and second largest holder of voting rights (V₁-V₂). The fourth column outlines the spread between largest and second largest holder of shares outstanding (H₁-H₂).

<table>
<thead>
<tr>
<th>Model Variable</th>
<th>I Control premium</th>
<th>II Control premium</th>
<th>III Control premium</th>
<th>IV Control premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.435***</td>
<td>0.265***</td>
<td>0.369***</td>
<td>0.385***</td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Pre-ownership</td>
<td>-0.005***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.000)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquired</td>
<td></td>
<td>0.001*</td>
<td></td>
<td>-0.004*</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.051)</td>
<td></td>
<td>(0.051)</td>
</tr>
<tr>
<td>(V₁-V₂)</td>
<td></td>
<td>-0.003</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.135)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(H₁-H₂)</td>
<td></td>
<td></td>
<td>-0.004*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0.051)</td>
<td></td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.082</td>
<td>0.016</td>
<td>-0.009</td>
<td>0.020</td>
</tr>
<tr>
<td>N</td>
<td>175</td>
<td>175</td>
<td>140</td>
<td>140</td>
</tr>
</tbody>
</table>

*** Significant at 1%
** Significant at 5%
* Significant at 10%
Model I in table 4 describes the effect on the tender offer premium caused by the bidder’s ownership before the announcement of the tender offer. The regression analysis confirms the linear relation with a negative impact earlier presented in Fig. 1, which is also identified by Betton, Eckbo and Thorburn (2008). This can be interpreted from the negative constant and the level of significance. Thus, the larger stake the bidder has before the announcement, it is more likely that the tender offer premium correspondingly will decline. This phenomena could be explained by value enhancing control transfers through internal mechanism, management turnovers and proxy fights (Choi, 1991). Firstly, Hirshleifer and Titman (1990) find that it gives the ability to dilute the minorities and thereby increase the probability of completing the tender offer. Secondly, a reasonable explanation for why investors with large initial ownership pay smaller premiums is due to lower information asymmetry which enables the bidder to better estimate the true value of the firm argued by Hirshleifer and Titman (1990), given that non-toehold bidders tend to overpay in accordance with the reasoning of Damodaran (2005). This could also explain why the largest premiums in our sample are offered by bidders without toeholds. Finally, Povel and Sertsios (2014) argue that toeholds enhance management influence and may contribute to mitigating the agency problem type I involved in tender offer transactions, where managers of target firms oppose bids. The offered premium can thereby be lower as management is under influence. Agency problems are indeed a major issue in many acquisitions which is highlighted by the research field (Jensen and Meckling, 1976).

In model I, both the Pre-ownership variable and the intercept are statistically significant at the 1 % level. This indicates a solid impact of the variable. The intercept shows that the premium for a tender offer coming from a bidder without ownership is expected to be 43,5% on average. Furthermore, the constant illustrates that each additional percent the bidder owns prior to the announcement lowers the premium with half a percent. Moreover, the average premium among the 97 observations without any prior ownership have an average premium of 44,31%. Hence, there is a small difference when estimating the average and expected Control premium including or excluding the observations with or without ownership. This points to a relatively certain estimation but considerations should also be taken to the high standard deviation of 41,42% concerning all premiums. Although the relationship presented in Fig. 1 may not appear to be strictly linear, the regression confirms a linear impact. However, as 100 of the 175 observations have an ownership of below 5%, reframing the relationship with toeholds alone may indicate another relation. Moreover, models in Table 4 contains no control variables that
could address the control premium more accurately and dislocate the effect from the independent variables.

In Model II, the variable of Acquired represent the reported deal in percentage of the target firm. The effect is positive at the 10% level of significance, suggesting that the larger stake the bidder acquires, the larger the premium. The results from the constant of model II in Table 4 suggest that there is indeed a non pro-rata relationship between the acquired stake and the premium paid. A pro-rata valuation of shares would yield a flat relation, not showing a significant constant.

As all observations of the variable Acquired above zero has led to a transaction, the intercept could arguably indicate the level with the highest premium that would still not be accepted in a deal by the current shareholders. At 26.5%, the intercept shows strong significance in its accuracy suggesting that shareholders on average would expect a higher premium than this in order to accept the tender offer.

Model III, which includes the variable of voting spread between the two largest blockholders of voting rights, does not support an impact on the bid premium. However, it should be noted that the constant yielded a p-value of 0.13 which is not far from making it significant at the 10% level. Nonetheless, the intercept is strongly significant indicating a higher premium with two equally strong owners, measured in voting rights. However, the overall large premiums can be contributing to this result. Moreover, the constant is still not significant as it would be if the measurement of Rydqvist (1996) would be applicable and the level of confidence is only above 80%. Overall, the relation between the two strongest owners of specifically voting rights and the premium paid in acquisitions is not apparent.

However, Model IV that captures the spread in holdings between the two largest shareholders shows greater correspondence with Rydqvist (1996) and the value of control measurement. In opposition to the spread of voting rights, the spread between blockholder’s shares, (H1-H2) shows significant impact with a p-value of 0.07. The negative constant illustrates that a lower difference in number of shares between the two largest owners implies higher valuation of control, arguably due to the competition in accordance with Rydqvist (1996). A potential interfering factor could be that dual class shares are not applied in all firms observed. Hence,
the spread of blockholders measured in shares could arguably be considered more accurate as it is measured equally among all observations.

The nature of the observations do not fully indicate a linear relation between ownership and premium due to the deviating premiums. Furthermore, the variables measuring control of shares are bounded to 100 as the upper limit for control. The relation looks more complex as to why a transformation of data via logarithmic linear regression analysis is performed.

4.2.1 Transforming the data
A regression analysis with the remaining observations where ownership is above zero is tested and presented in Table 5. The results still show a significance although 0.1% lower of each percent in ownership. This means that the slope seem to stagnate as the bidder purchase a toehold. A plausible nonlinear relation could be a decline in premium followed by a stagnation as ownership is capped to 100%. The nonlinear relation can be tested with ownership as a logarithmic function shown in Table 5.
Table 5
Bivariate and loglinear analysis.
This table shows 5 models where the dependent variable is the Control premium. The sample for Model I and II consists of 78 observations excluding Pre-ownership of 0. The sample for Model III consists of 87 observations excluding Pre-ownership and Acquired values of 0. The sample for Model IV and V consists of 139 observations excluding spread values of 0. The first and second columns illustrate the bidder’s ownership stake prior to the announcement of the tender offer where the latter is an expression of a logarithmic function of Pre-ownership. The third column outlines a logarithmic function of Acquired stake. The fourth column outlines a logarithmic function of the voting spread between the largest and second largest holder of voting rights. The fifth column outlines a logarithmic function of spread between largest and second largest holder of shares outstanding.

<table>
<thead>
<tr>
<th>Model Variable</th>
<th>I Control premium</th>
<th>II Control premium</th>
<th>III Control premium</th>
<th>IV Control premium</th>
<th>V Control premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.389***</td>
<td>0.178***</td>
<td>2.252***</td>
<td>0.260***</td>
<td>0.338***</td>
</tr>
<tr>
<td></td>
<td>(0,000)</td>
<td>(0,000)</td>
<td>(0,000)</td>
<td>(0,000)</td>
<td>(0,000)</td>
</tr>
<tr>
<td>Pre-ownership</td>
<td>-0.004**</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0,031)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ln(Pre-ownership - Pre-ownership)</td>
<td></td>
<td>-0.077**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0,024)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ln(Acquired)</td>
<td></td>
<td></td>
<td>0.045***</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>(0,003)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ln(V1-V2)</td>
<td></td>
<td></td>
<td></td>
<td>-0.027</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0,156)</td>
<td></td>
</tr>
<tr>
<td>ln(H1-H2)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>-0.032</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(0,102)</td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0.048</td>
<td>0.053</td>
<td>0.090</td>
<td>0.011</td>
<td>0.010</td>
</tr>
<tr>
<td>N</td>
<td>78</td>
<td>78</td>
<td>87</td>
<td>139</td>
<td>139</td>
</tr>
</tbody>
</table>

*** Significant at 1%
** Significant at 5%
* Significant at 10%

The first model in Table 5 should test the relation of all existing ownerships and the premium per share. Model I excludes a potential additional positive effect on the premium of having no ownership at all and thereby supposedly isolates the fraction that is owned to a more linear relation. The results still yield a negative relation, though with lesser impact and statistical significance. The corresponding regression of Table 4 are arguably affected by the non-toehold offers which include premiums well above average causing the slope to be steeper. This points towards an additional premium of more than the expected 0,4% when bidders’ ownerships are 0 compared to 1%. The intercept of Model I in Table 5 also indicates a 4,6% lower expected premium of 38,9% without a Toehold, compared to earlier estimated 43,5% from Table 4, which included all tender offers. A test of a declining and stagnating relation between Pre-
ownership and Control premium is displayed in Model II of Table 5 where the independent variable is reframed in order to normalize the observations.

The second model of Table 5 describes Pre-ownership with an exponential relation to control premium as a logarithmic function. The result of the log-linear regression yields a negative significant constant, in resemblance to the simple linear ordinary least squares of Table 4 where it showed a stronger significance. However, evaluation of the bidder’s ownership excluding the ones without ownership is best described as the logarithmic function. This can be deduced from the p-values of Model I and II in Table 5.

The log-linear regression models exclude negative premiums in order to state a correct logarithmic function. The exponential function with a negative constant indicates a stagnating relation with the steepest slope found where Pre-ownership approach zero. This further indicates an extra expected premium for bidders who do not have any toehold.

Furthermore, as the slope stagnates when Pre-ownership increases, the result of Model II in Table 5 indicates that the pricing in premium per share is not equal irrelevant of the bidder’s ownership. The slope retrieved from Table 4 is by the results of this model, not accurate when considering all fractions of ownership. Smaller premium of a tender offer is here to be expected from additional ownership, but the decrease is arguably not as substantial.

The third model, including Acquired stake of the deal continues to mirror the earlier measurement of ownership prior to the announcement. In correspondence with what the bidder already controls, the premium paid per share seem to increase exponentially with the fraction acquired. The results confirm a more complex relation when considering the acquired percentage and premium per share. The level of significance increased dramatically compared to Table 4 which points to this non-linear relation being more accurate. Thus, the minority discount seem applicable where an investor looking to acquire a larger stake has to pay extra for the value of control. Correspondingly, the smallest position one can acquire yields the most minority discount.

Concerning the spread between blockholders, a linear relation seem more accurate based on the results of Table 4 and 5. Going forward, the independent variables can be further evaluated by limiting the ownership stake to toeholds only.
4.2.2 Toeholds prior to the announcement

In this section, we replace the variable Pre-ownership with the new variable Toehold which only includes ownership stakes ranging between 5-50% in accordance with the definition of Betton, Eckbo and Thorburn (2009).

As the non-linear relation of Pre-ownership tends to indicate a stagnation of premium per share, a specific analysis of Toehold ownership is in place. The analysis is made in order to see how the control variables interact with our dependent variable when running them one by one. Table 6 displays the analyses of toehold ownership impact.

Table 6

Bivariate Analysis.

This table shows 4 models where the dependent variable is the Control premium. The base sample consists of 51 observations including Pre-ownership from 5 to less than 50% denoted as Toehold. All 51 tender offers are included regardless of their deal status. The first column illustrate the bidder’s ownership stake prior to the announcement of the tender offer (Toehold). The second column illustrates the bidder’s acquired stake (Acquired). The third column illustrates the spread between the largest and the second largest holders of voting rights ($V_1-V_2$). The fourth column outlines the spread between the largest and second largest blockholder of shares outstanding ($H_1-H_2$).

<table>
<thead>
<tr>
<th>Model Variable</th>
<th>Control premium I</th>
<th>Control premium II</th>
<th>Control premium III</th>
<th>Control premium IV</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0.548***</td>
<td>0.231**</td>
<td>0.215**</td>
<td>0.320***</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.011)</td>
<td>(0.023)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>Toehold</td>
<td>-0.009*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.059)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acquired</td>
<td></td>
<td>0.001</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.494)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>($V_1-V_2$)</td>
<td></td>
<td>0.002</td>
<td></td>
<td>-0.005</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.700)</td>
<td></td>
<td>(0.300)</td>
</tr>
<tr>
<td>($H_1-H_2$)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.052</td>
<td>-0.011</td>
<td>-0.022</td>
<td>0.003</td>
</tr>
<tr>
<td>N</td>
<td>51</td>
<td>51</td>
<td>40</td>
<td>40</td>
</tr>
</tbody>
</table>

*** Significant at 1%
** Significant at 5%
* Significant at 10%

Toehold has a negative constant with a p-value of 0.059 indicating a negative relationship between the bid premium and Pre-ownership, which is in line with the arguments of Goldman and Qian (2005) and Betton and Eckbo (2000). However, the effect is not as significant as the impact of all ownership sizes measured in Table 4. The slope of Acquired is small and not
significant which could in fact imply that there is a pro rata valuation of the remaining shares when the bidder has a toehold.

Furthermore, neither the spread variable \((V_1 - V_2)\) nor \((H_1 - H_2)\) turn out to be significant, implying that no conclusion can be drawn specifically for toeholds when looking at these two control variables outlined by Rydqvist (1996). The number of observations are relatively low in this model due to the absence of defined toeholds. Hence, the sample size should be taken into consideration when interpreting the results of the models in Table 6.

Throughout section 4.2, the variables are tested individually in models without addressing other aspects that may inflict the control premium. Proceeding to the next section, the models will be extended by including control variables.
4.3 Multivariate analysis of ownership prior to the announcement

4.3.1 Ownership prior to the announcement

Multivariate analyses are conducted in order to elaborate on how the variables of Pre-ownership, \((V_1-V_2)\) and \((H_1-H_2)\) interact with the control variables. The earlier estimated impacts from Table 4 and 5 may be reallocated to other events which further test the accuracy of impact. The analysis is conducted through four models which are displayed in Table 7.

### Table 7
Multivariate Analysis.
This table shows 4 Models where the dependent variable is the Control premium. The base sample consists of 142 observations including Pre-ownership from 0 to less than 100%. All 142 tender offers are included regardless of their deal status. The first column illustrates the bidder’s ownership stake prior to the announcement of the tender offer with regards to control variables of reported Deal size in USD million, Free float in percent and dummy variables for Mandatory (denoted 1 if mandatory) and Competitive bids (denoted 1 if competitive). The second column illustrates the Acquired stake and includes the same control variables as in column I. The third column outlines the voting spread between the largest and second largest owner of voting rights \((V_1-V_2)\) including Acquired stake and Deal size. The fourth column outlines the spread between largest and second largest holder of shares outstanding \((H_1-H_2)\) including Acquired stake and Deal size.

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable</th>
<th>I Control premium</th>
<th>II Control premium</th>
<th>III Control premium</th>
<th>IV Control premium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intercept</td>
<td>0,329* (0,060)</td>
<td>0,120 (0,346)</td>
<td>0,274*** (0,000)</td>
<td>0,286*** (0,000)</td>
</tr>
<tr>
<td></td>
<td>Pre-Ownership</td>
<td>-0,004** (0,020)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Acquired</td>
<td>0,001 (0,108)</td>
<td>0,001* (0,060)</td>
<td>0,001* (0,060)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>((V_1-V_2))</td>
<td></td>
<td>-0,003 (0,167)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>((H_1-H_2))</td>
<td></td>
<td></td>
<td></td>
<td>-0,004* (0,066)</td>
</tr>
<tr>
<td></td>
<td>Deal size</td>
<td>1,4∙10^{-5}* (0,074)</td>
<td>1,7∙10^{-5}*** (0,037)</td>
<td>1,7∙10^{-5}** (0,025)</td>
<td>1,7∙10^{-5}** (0,023)</td>
</tr>
<tr>
<td></td>
<td>Free float</td>
<td>0,001 (0,466)</td>
<td>0,002 (0,150)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mandatory</td>
<td>-0,156 (0,112)</td>
<td>-0,213** (0,023)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Competitive</td>
<td>0,224 (0,113)</td>
<td>0,236* (0,098)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Adj. R^2 | 0,118 | 0,100 | 0,048 | 0,059
N | 142 | 142 | 140 | 140

*** Significant at 1%
** Significant at 5%
* Significant at 10%
Model I in Table 7 includes the percentage stake of Pre-ownership, including toeholds of 5-50% which the bidder has in the target firm prior to the announcement. Hence, the model should capture the effect of all types of ownerships, neither limited to controlling stakes nor toeholds. The Pre-ownership variable is significant with a negative constant still implying that a larger stake owned by the bidder in associated with less bid premium, which is congruent with earlier regressions. The level of confidence still exceeds 95% with control variables which gives ground to draw conclusions about Pre-ownership and its negative effect on the premium. This estimation is in line with the findings of Choi (1991), Hirshleifer and Titman (1990) and Betton, Eckbo and Thorburn (2008).

The models also include Deal size which has a positive and significant constant though modest in Model I where it is at the 10% level. The result shows that the size of the transaction, expressed in USD million, has a positive effect on the bid premium. In other words, a greater nominal offer on the remaining shares is associated with a higher premium. The implication of this finding is that larger deals concern larger companies and hence, implies larger bid premiums.

Nonetheless, as Model I considers both Pre-ownership and Deal size, the positive constant of Deal size could simply indicate less offered premiums in squeeze-outs (Bates, Lemmon and Linck, 2006). However, the size of the transaction is affected by both the valuation of the company but also the targeted fraction of shares. If the announced tender offer targets a low amount of shares due to an already large toehold, the Deal size would arguably decrease as the variable of Pre-ownership increases, causing collinearity with low levels of significance on both variables. A correlation between the variables shows -0.086, suggesting limited collinearity. Hereby, it is more likely to address the effect of larger and higher valued firms which should be accompanied by larger premiums.

The variable that should capture parts of the DLOM discussed by Schweih (2010) is the Free float. Free float in model I shows no sign of significance and signals to be more redundant than useful when explaining the premium along with remaining variables. It could be explained by the argument of the DLOM which ought to be minimized as all observations can be considered marketable as they are listed companies. Still, if DLOM exists in listed companies, the results
indicate that *Free float* is not an efficient variable to capture its effect on the premium and minority discount. Moreover, neither of the dummy variables included in Model I show impact on the premium. However, both mandatory and competitive bids are close to be considered significant at the 10% level, with p-values of 0.112 and 0.113 respectively. The rationale of having a dummy for mandatory bids is simply because a firm is required to place a mandatory bid when holdings of 30% and 50% (Lag (2006:451) om offentliga uppköpserbjudanden på aktiemarknaden, 2006), which could lead to bids with the intention of not acquiring the potential target but do so only because of regulation. Although the dummy variables may not be suitable to mark as significantly influential, they do help to allocate the residuals to miscellaneous variables. Arguably, it would seemingly be false to claim that these dummy variables do not have an effect due to the p-values.

Neither *Acquired* nor *Free float* of Model II ended up being statistically significant at the 10% level. However, *Mandatory* bids show a significant impact with a p-value of 0.023, which indicates that the premium is affected negatively if the bid is of a mandatory nature.

Competitive bids and premiums are positively related. The dependent variable is controlled for and showed a p-value of 0.098 and the rationale behind this phenomena is that a bidding competition contributes to a stock price runup in the case of an auction which is in line with the arguments of Betton, Eckbo and Thorburn (2009). Moreover, auction theory indicates that toehold bidding benefit the given bidder over rival bidders.

In resemblance with earlier regressions, the voting spread \((V_1-V_2)\) in Model III shows no solid level of significance, which prevents us from drawing any conclusions on the relationship with the premium that Rydqvist (1996) argues. Also, *Acquired* is significant with a p-value of 0.06. Key insight in this model is that \((V_1-V_2)\) do not turn out to be significant but this does not necessarily imply that our study contradicts Rydqvist’s (1996) arguments. Rather, it can be explained by the fact that our data do not only consist of companies with dual class shares which might have impacted the outcome. Model III can be compared with Model IV since the difference lies is in the fact that \((H_1-H_2)\) turned out to be significant, which implies that we can tell more about the spread of the largest and the second largest holder of shares than the spread of the largest and second largest holder of voting rights. Nevertheless, this is more congruent with the arguments of Rydqvist (1996).
4.3.2 Transforming the data

The logarithmic functions of the variables *Pre-ownership* and *Acquired* are tested in the multivariate models in order to further estimate the accuracy of the relation beyond identified potential interfering factors. The overall results indicate less accurate impact of the models which are presented in Table 8. Transformation of data is advocated when variance of the residuals are not constant and heteroscedasticity may be occurring (Kleinbaum et al. 2008). Hence, the variables with bounded intervals of zero to 100 are transformed to logarithmic expressions. However, transforming the data also implies a normalization of the observations which can enhance weak uncertain relations.
Table 8
Multivariate analysis.
This table shows 4 models where the dependent variable is the Control premium. The sample for Model I consists of 60 observations excluding Pre-ownership of 0. The sample for Model II consist of 62 observations excluding Pre-ownership and acquired values of 0. The sample for Model III and IV consists of 58 observations excluding Pre-ownership, acquired and spread values of 0. The first column illustrates a logarithmic function of the bidder’s ownership stake prior to the announcement of the tender offer with regards to control variables of reported Deal size in USD million, Free float in percent and dummy variables for Mandatory and Competitive bids. The second column illustrates a logarithmic function of the Acquired stake prior to the announcement of the tender offer with regards to control variables of reported Deal size, Free float and dummy variables for Mandatory (denoted 1 if mandatory) and Competitive bids (denoted 1 if competitive). The third column outlines a logarithmic function of Acquired stake along with voting spread between the largest and second largest holder of voting rights ($V_1 - V_2$) and the control variable of reported Deal size. The fourth column outlines a logarithmic function of Acquired stake along with voting spread between the largest and second largest holder of shares ($H_1 - H_2$) and the control variable of reported Deal size.

<table>
<thead>
<tr>
<th>Model</th>
<th>Variable</th>
<th>I: Control premium</th>
<th>II: Control premium</th>
<th>III: Control premium</th>
<th>IV: Control premium</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intercept</td>
<td>0.183 (0.223)</td>
<td>0.202 (0.150)</td>
<td>0.291 (0.000)</td>
<td>0.216 (0.033)</td>
</tr>
<tr>
<td></td>
<td>$\ln\left[\frac{\text{Pre-ownership}}{100 - \text{Pre-ownership}}\right]$</td>
<td>-0.025 (0.549)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$\ln\left[\frac{\text{Acquired}}{100 - \text{Acquired}}\right]$</td>
<td>0.029 (0.182)</td>
<td>0.032 (0.112)</td>
<td>0.002 (0.121)</td>
<td>-0.006* (0.051)</td>
</tr>
<tr>
<td></td>
<td>$(V_1 - V_2)$</td>
<td>-0.358 (0.176)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>$(H_1 - H_2)$</td>
<td></td>
<td></td>
<td>-0.052 (0.821)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Deal size</td>
<td>$-3.0 \cdot 10^{-5}$ (0.408)</td>
<td>$1.4 \cdot 10^{-5}$ (0.658)</td>
<td>$1.6 \cdot 10^{-5}$ (0.605)</td>
<td>$2.2 \cdot 10^{-5}$ (0.462)</td>
</tr>
<tr>
<td></td>
<td>Free float</td>
<td>-0.001 (0.690)</td>
<td>0.001 (0.589)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mandatory</td>
<td>-0.132 (0.205)</td>
<td>-0.100 (0.302)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Competitive</td>
<td>0.884*** (0.001)</td>
<td>-0.052 (0.821)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adj. $R^2$</td>
<td>0.186</td>
<td>0.000</td>
<td>0.061</td>
<td>0.107</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>60</td>
<td>62</td>
<td>58</td>
<td>58</td>
<td></td>
</tr>
</tbody>
</table>

*** Significant at 1%
** Significant at 5%
* Significant at 10%

The Dummy variable turned out to be the only significant variable in Model I of Table 8 and the model fails to align the earlier seemingly clear impact of the Pre-ownership variable. However, as the multivariate analyses of Table 7 was executed with the same control variables, the models of Table 8 merely neglects the log-linear relation of Pre-ownership. With this in
mind, it should noted that model I in Table 8 yields the highest recorded adj. R² among all models in this paper which implies that other factors indeed are contributing to the control premium. Nevertheless, the spread between blockholders measured in shares, remains with a negative significant impact presented in Model IV in Table 8. In both Models III and IV where Free float, Competitive and Mandatory bids are excluded, the transformed logarithmic function of acquired stake indicate p-values of slightly above 10. We conclude that the models show less explanatory results when testing the logarithmic functions.

4.4 Applying the minority discount on firm valuation

A firm with a majority owner has fewer shares left that are acquirable for other investors. Considering the arguments of Damodaran (2005), the majority owner has already paid a premium for value of control and hence there is not much minority discount left. Moreover, the threshold of being the largest controlling owner in number of shares is being lowered when the existing largest owners are equally as influential. A single dominant owner signals that control for minority owners is hard to attain. Based on this argument, the discount is expected to be greater in firms with dispersed ownership. This aligns the argumentation of Damodaran (2005), claiming that only parts of the value of control is reflected by the market valuation. Accordingly, low control premiums are not simply due to low value of control, rather it depends on the fact that the firm most certainly already had a high valuation prior to the tender offer.

A bivariate analysis is conducted in order to analyze how the valuation measured by EV/EBIT, EV/EBITDA and EV/S relates to the Control premium. The results can indicate whether profitability valuation is connected to the value of control. Roll (1986) laid the foundation of the CEO hubris hypothesis claiming that bidders overvalue their targets and pay too much. In contrast, Damodaran (2005) argues that the premium paid simply reflects the value of control. The effect of the market valuation prior to the tender offer is described in Table 9 where two of the value multiples indicate a negative impact on the offered premium.
Table 9
Bivariate Analysis
This table shows 3 models where the dependent variable is the Control premium. The sample of Model I consists of 102 observations excluding EV/EBIT of less than 0. The sample of Model II consists of 92 observations excluding EV/EBITDA of less than 0. The sample of Model III consists of 158 observations. The first, second and third column illustrate the target’s ratios EV/EBIT, EV/EBITDA and EV/S respectively prior to the announcement of the tender offer. The value multiples were inverted from the announced price of the tender offer with the derived minority discount.

<table>
<thead>
<tr>
<th>Model Variable</th>
<th>I Control premium</th>
<th>II Control premium</th>
<th>III Control premium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>0,419***</td>
<td>0,0425***</td>
<td>0,391***</td>
</tr>
<tr>
<td></td>
<td>(0,00)</td>
<td>(0,000)</td>
<td>(0,000)</td>
</tr>
<tr>
<td>EV/EBIT</td>
<td>-0,003</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0,192)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>EV/EBITDA</td>
<td></td>
<td>-0,005*</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0,081)</td>
<td></td>
</tr>
<tr>
<td>EV/S</td>
<td></td>
<td>-0,013***</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0,001)</td>
<td></td>
</tr>
<tr>
<td>Adj. R²</td>
<td>0,007</td>
<td>0,023</td>
<td>0,066</td>
</tr>
<tr>
<td>N</td>
<td>102</td>
<td>92</td>
<td>158</td>
</tr>
</tbody>
</table>

*** Significant at 1%
** Significant at 5%
* Significant at 10%

The negative constant in Model I is not significant. Thus, the valuation based on EV/EBIT does not statistically explain the effect on the premium offered in a tender offer. However, Model II of Table 7 has a significant negative constant, implying that for each time the value of the firm increases by one earnings before interest tax depreciation and amortization, a lower premium of 0,5% is to be expected. This estimation is significant with at the 10% level meaning that the firms with lower valuation multiples are more likely to be acquired with higher premiums. This finding goes in line with Damodaran (2005) who claims that minority discount is already priced in each firm but to a different extent. This could indicate an upper boundary with value of control where premiums paid reflect how much was left out in the expected value of control. A low valuation increases the range to the full potential value. Hence, high valued firms with high expectations of future earnings could already have the control aspect taken into account when appraising the value. Furthermore, lower valuation and higher premiums. The difference between premiums and valuation prior to the tender offer signals that there are high benefits of control as argued by Holmén and Knopf (2004).
One would perhaps expect shareholders in high valued firms to require more premium when valuations of the firms are already higher than average. Furthermore, the CEO hubris explained by Roll (1986) would arguably indicate that premiums are too high. One could apply his argument by stating that low valued firms should not have a higher premium and vice versa. Low valued firms may have lower growth prospects and should all else unchanged thereby perhaps have lower premiums. The valuation multiple models points to the opposite where high valued firms are associated with lower premiums. However, a takeover naturally comes with changes.

The future opportunities for firm growth may be substantial for the value, but it is neglected in the premium by the models of value multiples in Table 9. Nonetheless, the findings are in line with the arguments of Damodaran (2005) concerning the value of control and furthermore no considerations are taken to whether the offer is accepted or rejected. Similarly, Akhigbe, Martin and Whyte (2007) find that firms with weak stock price performance experience higher valuation in tender offers.

Model III in Table 9 further supports the view of Damodaran (2005) with higher level of significance. This is represented in the same way as the premium and thereby the minority discount is negatively impacted by higher valuation prior to the announcement. However, the assumption of control valuation should be considered quite simplistic as it rules out any other factors in the valuation. Here, Damodaran (2005) seem to contrast Akhigbe, Martin and Whyte (2007) in pricing of valuation, who argue that growth prospects have a larger role. The high valuation may also be due to other factors driving value per share.

Having that said, the assumption of Damodaran (2005) seem appropriate with the value estimations derived from the premiums. Moreover, 128 out of the 158 observations had a $EV/S$ of above 3,05 which is the average of the sample. That further indicates a higher frequency of tender offers occurring on low valued firms. Naturally, the mean of such a measurement is largely affected by the upper part of the value multiples as these have a lower bound of 0. The highest estimated premiums had $EV/S$ values of 1,2, 0,7 and 0,4 respectively. In contrast, the median of the sample is 0,88 which is above the second and third largest premiums but are still relatively low valuations. This supports the view of Schwartz (1982), Palepu (1986) and Song and Walking (1993) who find that low valued firms have a higher probability of being acquired but contradicts Akhigbe, Martin and Whyte (2007) who find the opposite.
Finally, our results indicate that the ownership structure affects the revealed minority discount. Hence, the non-pro rata valuation of shares should be considered in negotiations of equity claims. However, the exact relation is not fully evaluated which calls for future research. The residuals of our models indicate that variables beyond share control in the target firm can be included for greater accuracy in estimating the control premium. The largest potential minority discount is found in firms lacking a dominant owner. However, the discount may only be obtained when another shareholder seeks control. Furthermore, as shown by the spread between blockholders of outstanding shares, the spread between dual class shares can be comparable to the premium for control in tender offers.
5. Robustness tests

Since we expect multicollinearity between Pre-ownership, Acquired, \((V_1-V_2)\) and \((H_1-H_2)\) we estimate the correlation which should give an indication of it. The correlation between Pre-ownership and Acquired is estimated to -0.461 which shows signs of a relation. The correlation between variables measuring blockholder spread is 0.927 showing a strong relation.

The heteroscedasticity of our sample can be observed by plotting the predicted values of the model and their standardized residuals which explains the accuracy of the predictions. We notice a higher degree of variance in Control premium where the Pre-ownership is small which could be a sign of heteroscedasticity. Error in variance could appear as the standardized residuals may increase as the input variables increases (Kleinbaum et al., 2008). The residuals of each predicted value from the multiple regression of Model I in Table 7 is presented in Fig. 4. Appearing patterns may indicate heteroscedasticity in the model including observations of Pre-ownership.

Our sample of tender offers indicates a cluster among the average premium with small residuals. However, this is also where the largest spread between standardized residuals of the predicted values appear. This could point to where the model including variables Ownership, Free float, Mandatory and Competitive is most inaccurate to estimate the Control premium.
The same reasoning is applied for Model IV in Table 7, which includes the independent variables *Acquired* and 

\((H_1-H_2)\), illustrated in Fig. 5. However, the residuals seem to be more concentrated without a specific pattern which is more in line with the assumptions of multiple regression (Kleinbaum et al., 2008).

![Fig. 5](image)

**Fig. 5.** Predicted values and residuals of the model describing control premium as the dependent variable of the bidder’s acquired stake and the spread of shares between the two largest blockholders, with regards to control variables of reported *Deal size*, *Free float* and dummy variables for *Mandatory* and *Competitive* bids.

The *Control premium* could potentially also be an effect of the conditional offer. Arguably, an offer including a higher premium is more likely to be conditional in order to avoid the acquisition of a partial minority interest only. In our sample, 81 offers were conditioned to 90% of the outstanding shares with an average premium of 33,08% while the unconditional offers averaged 32,48%. Remaining conditional offers ranging between 40-80% had an average premium of 54,37% which includes the extreme case of Wayfinder Systems AB with a premium of 258%. Hence, the distribution does not particularly indicate a specific relation between the conditional offer and the *Control premium*.

In order to better capture the liquidity aspect, Betton, Eckbo and Thorburn (2008) use a dummy variable for penny stocks and main lists which in this case potentially could have an impact on the *Control premium*. Including a dummy variable for *Main list* in the multivariate analysis of *Pre-ownership* in Model I in Table 7 reduces the overall p-values but without changing the level of significance. Arguably, the variable of *Deal size* coincides and captures a portion of
the potential effect. However, the positive constant of the dummy variable yields a p-value of 0.319 which is not enough to confirm an actual impact of a main list. Also, the adjusted model lowers the adjusted R square to 0.109 which indicates a less accurate model by considering the main list. The dummy variable is treated as 1 if the company was listed on Nasdaq OMX A- or O-list during the announcement of the tender offer. Data is retrieved from Skatteverket.
6. Conclusions

Our research suggest that minority discounts can be applied in all publicly traded firms but is only exposed in the event of a tender offer transaction. The largest minority discount and premium for control can be found in low valued firms with tight ownership spreads where a potential bidder does not have a majority position nor a toehold. The ownership of the acquirer is best described with a constant negative impact on the premium for control. Our study indicates that each percent the bidder owns prior to its tender offer reduces the offered premium with approximately two percent of a correspondent bid without toehold. The observations point to an additional effect of having a toehold expressed by lower estimated premiums. In contrary, a squeeze out-effect where minorities receive additional premium cannot be confirmed. Additionally, the effect of acquired stake on the premium indicates a positive linear relationship, although it is better described as a logarithmic function where premiums are expected to compound in regards to the acquired stake. However, the distinct relation seem ambiguous as the variance alternates depending on the bidder’s ownership and its acquired stake. Overall, the discounts have a high degree of variance which makes the estimation of an average seem as an inaccurate metric.

We find no clear evidence of the spread between the two largest blockholders of voting rights having an effect on the premium for control. Rather, the spread between the two largest blockholders of shares is what seemingly contributes to the estimation of the premium. In this case, shares with additional voting rights do not seem to have the ultimate impact. As we show, the distribution of ordinary shares seem to be more important in tender offer premiums. The impact of voting rights contra outstanding shares can arguably be further evaluated in future research. Moreover, the squeeze out effect of minority shareholders yields vague results which calls for a focused investigation with additional squeeze out events in order to better estimate the potential minority gains.
References


