Tender Offers versus Block Trades: Empirical Evidence

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Abstract

In this paper we test whether the determinant of a block trade and tender offer probabilities differ and whether the relative magnitude of the security and private benefits can explain the choice of transfer mode. We investigate the Swedish market for corporate control and use the wedge between cash flow rights and voting rights as a proxy for the incentives to extract private benefits. Our results indicate the importance of considering the control transfers through takeovers and block trades as two distinctive events. The likelihood of a public tender offer (block trade) decreases (increases) with the use of dual class shares. The results are consistent with our general hypothesis that the likelihood of block trades relative to public tender offers increases with the incumbent's incentives to extract private benefits.

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JEL Classification: G34; G32

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1. Introduction

Researchers in corporate finance have focused considerable attention on issues affecting transfer of control to the most efficient user of corporate resources.[1] The market for corporate control represents the institutional framework facilitating the control changes. The typical modes of control transfer in publicly traded companies are block trades and tender offers.[2] Until recently the finance literature tended to treat the two transfer modes as equivalent as long as a block trade or tender offer would results in the same party having control (Burkart, Gromb, and Panunzi, 2000). Burkart et al. (2000) argue that the incentive effect of the controlling party's final holding has largely been overlooked in the control transfer literature (e.g. Grossman and Hart, 1988; Bebchuk, 1994; Zingales, 1995) and is likely to have a significant effect on the choice of a transfer mode. One suggested factor affecting this choice is interdependence of security benefits and private benefits attached to a controlling ownership stake. Recent empirical literature shows that the selection of equity investments differs significantly between investors who enjoy private benefits and investors who enjoy only security benefits (e.g. Giannetti and Simonov, 2006). To our knowledge, our paper is the first to illustrate the critical importance of private and security benefits for the choice of transfer mode in an equity transactions involving change of control.

In this paper we test whether the determinant of a block trade and tender offer probabilities differ and whether the relative magnitude of the security and private benefits can explain the choice of transfer mode. We hypothesize that the security and private benefits tend to be substitutes, with private benefits proportionately increasing with a decrease in a

[1] See e.g. Grossman and Hart (1980) and Shleifer and Vishny (1986) for theoretical models. For U.S. empirical evidence on the likelihood of takeovers see e.g. Walkling and Long (1984), Walkling (1985), Morck *et al.* (1989), Mikkelson and Partch (1989), Ambrose and Megginson (1992, Song and Walkling (1993), Shivdasani (1993) and Comment and Schwert (1995) and Espahbodi and Espahbodi (2003). For U.K. empirical results on the likelihood of takeovers, see e.g. Weir (1997) and Sinha (2004).

[2] Control changes through a block trade tend to be more common than tender offers. In 2000, only 27 percent of the changes in control of U.S. firms were brought about by public tender offers (Schmid, 2002).

controlling ownership stake and with an increase in a wedge between cash flow and control rights. A wedge between cash flow rights and voting rights can be achieved by the use of dual class shares and stock pyramids. A greater proportion of private benefits would likely increase the incentives to preserve these benefits and therefore increase the probability of a block trade transfer mode (Burkart et al., 2000). Given that private benefits tend to be internalised in a tender offer we expect that the likelihood of a tender offer would tend to increase with a reduction in the factors used as proxies for private benefits of control.

Little is known about the markets of corporate control outside the Anglo-Saxon countries. Denis and McConnell (2003) point out that takeover activity does not appear to be an important governance mechanism around the world. Franks and Mayer (2001) and Jenkinson and Ljungqvist (2001) point out that relative to public tender offers, block trades are more common in Europe (Germany). Bethel, Liebeskind, and Opler (1998) find that the market for partial corporate control (block trades) plays an important role in limiting agency costs in U.S. corporations. However, Franks and Mayer (2001) point out that there are marked differences between the Anglo-Saxon countries and continental Europe (Germany) in terms of dynamic relations involving transfers of control. The gains from German block trades are small and appear to accrue solely to large blockholders.

The concentrated ownership structure of firms in non Anglo-Saxon countries is also very different from the typical dispersed ownership structure in the U.S. and the U.K. (La Porta et al., 1999). Typically, firms outside the Anglo-Saxon countries have a controlling shareholder, often a family that can block any takeovers attempts if the owner does not accept the terms of the bid. Furthermore, control (votes) is often separated from ownership of cash flow rights by dual class and pyramids. As far as we know, empirical results on the effect of separation voting rights from cash flow rights on the market for corporate control are scarce.

In this paper we investigate the Swedish market for corporate control. Exploring the effect of private benefits of control on a choice of a control transfer mode in the context of the Swedish equity market offers some advantages. First, Sweden has an extreme separation of ownership and control. It ranks #1 in terms of the use of dual class shares and #2 in terms of the frequency of pyramid structures (after Belgium) (La Porta, Lopez-de-Silanes, and Shleifer, 1999).[3] Thus, we have a simple measure of the incentives to extract private benefits from the corporation, the separation between ownership and control due to dual class shares and pyramids. This measure varies both between firms and within firms over time and it has also been used in earlier literature (see e.g. Claessens, Djankov, Fan, and Lang, 2002; Faccio, Lang, and Young, 2001; Giannetti and Simonov, 2006).

Second, Sweden has the highest percentage of widely held firms in Europe and, by European standards, a highly capitalized stock market (Faccio and Lang, 2002). The percentage of foreign investments on the stock market is comparable to the U.K. and higher than in the U.S.. Fifty percentage of the stock market is held by institutional investors and 27 percent is held directly by households. These numbers are among the highest in Europe and comparable to the U.S. levels (Guiso, Haliassos, and Jappelli, 2003). Thus, conclusions based on events on the Swedish stock market probably allow generalizations beyond the Swedish market (Giannetti and Simonov, 2006).

Most of the existing financial economics literature on the likelihood of control changes relies on binary choice models. We adopt another approach and estimate hazard rate of the takeover and block trades, respectively. We use panel data where a majority of the firms are not taken over during our sampling period. The hazard function approach allows us to investigate whether, given that a firm has not been taken over (experienced a block trade)

[3] Typically, Swedish firms issue A and B shares. The A-shares are one-share one-vote while the B shares are one-share 0.1 votes.

up to a certain point, changes in particular characteristics (e.g. ownership) of the firm will lead to a takeover (block trade) event.

We use an unbalanced panel of 200 large Swedish non-financial firms listed on the Stockholm Stock Exchange 1985-2000. The sample contains 1706 firm years. On average about 70 percent of the Swedish stock market capitalization is included in the sample each year. The sample includes 40 successful non-partial tender offers and 69 block trades.

The evidence we present in this paper points out the importance of studyng the control transfers through takeovers and block trades as two distinctive events. According to our expectations we find that some important differences in factors determining the likelihood of the two events. Combining these events in a single model would lead to obscuring the information conveyed by a choice of a transfer mode (Burkart et al., 2000). Increase in the largest shareholder's ownership stake tends to increases (decreases) the likelihood of a public tender offers (block trade). Conversely, the use of dual class shares by the largest shareholder decreases (increases) the likelihood of a public tender offer (block trade). These results are consistent with our general hypothesis that the security and private benefits tend to be substitutes. Private benefits are proportionately increasing with a decrease in a controlling ownership stake and with an increased separation between cash flow and control rights. Finally, it appears as if pyramids and dual class shares have different empirical implications in terms of the market for corporate control. While dual class separation appears to decrease the likelihood of tender offers, pyramidal separation increases the likelihood of tender offers. Pyramidal separation is not related to the likelihood of block trades.

The rest of the paper is organized as follows. The next section outlines our hypotheses and describes the data. Section 3 discusses the survival analysis methodology. Section 4 presents the empirical results and final section summarizes and concludes.

2. Hypotheses and data

2.1. Hypotheses Public Takeovers and Block Trades

Grossman and Hart (1980) show that, due to the free-rider problem, an outsider will never take over a diffusely held firm in order to implement the value-improving changes. Shleifer and Vishny (1986) consider a firm with a large minority blockholder and a fringe of small shareholders. When the large shareholder's return on his own shares suffices to cover monitoring and takeover costs, performance improving public takeovers will be possible. Either the large shareholder himself makes a public takeover or he facilitates for a well-informed outsider, who has no initial position in the firm, to make a public takeover. The outsider and the incumbent large shareholder would simply split the gains from the rise in the price of the incumbent's shares. The more shares the incumbent owns the more likely it is that the return associated with improved performance will cover monitoring and takeover costs. Viewed in another way, the more shares the incumbent owns the easier it is to convince small shareholders that a low bid premium indicates a small performance improvement rather than an attempt to profit at their expense. If the incumbent accepts a bid by an outsider it is convincing because, as the incumbent's stake in firm increases it is in his own interest to accept takeover bids associated with some lower value improvements. This is the basis for our first hypothesis

Hypothesis 1: The risk of a public takeover is increasing in the largest shareholder's ownership in the firm.

Shleifer and Vishny (1986) do not consider the possibility that the large minority shareholder derives private benefits of control and how this would affect the probability of a takeover. Burkart, Gromb, and Panunzi (2000) also consider control transfers in firms with a dominant

minority shareholder and otherwise dispersed owners. In Burkart et al. the incumbent is both willing and able to improve firm performance by monitoring, replacing top management, or by taking an active part in the firm's management. However, the incumbent's influence over corporate decisions also enables him to pursue own goals and extract private benefits. The incumbent can sell the minority block to an outside bidder in a negotiated block trade or as part of a public takeover. All private benefits are transferable to the bidder and the bidder is therefore willing to compensate the incumbent for the private benefits. The bidder will improve firm performance irrespective of transfer mode. However, compared to a block trade, a public acquisition leads to more concentrated ownership. The controlling shareholder's incentive to extract private benefits decreases with ownership concentration since he internalizes more of the inefficiencies associated with extraction of private benefits when the size of the block increases (If he acquires the whole firm there are no private benefits of control). Burkart et al. consider the incumbent and the bidder as a coalition. The coalition has to acquire shares at the post tender offer value since the dispersed shareholder free-ride in tender offers. Thus, since the coalition is not compensated for the reduction in private benefits associated with more concentrated ownership, only the block is traded. We relax this condition and base our second hypothesis on the argument that the relative contribution to the value of the controlling block of private benefits relative to security benefits increases with a decrease in the size of the controlling block.

Hypothesis 2: The risk of a block trade is decreasing in the largest shareholder's ownership in the firm.

When the large shareholder's control of voting rights are separated from cash flow rights by the use of dual class of shares and/or stock pyramids, the large shareholder's mitigation of the

free-rider problem is reduced. Grossman and Hart (1988) also show how deviations from one share one vote can reduce the likelihood of takeovers in the presence of private benefits of control.

Hypothesis 3: The risk of a public takeover is decreasing in the large shareholder's separation of voting rights and cash flow rights.

Finally, other things equal, a larger wedge between the voting and the cash flow rights is likely to increase the relative magnitude of the private benefits for the controlling owner since it increases his ability/incentive to extract private benefits. Therefore a larger wedge between voting rights and cash flow rights should increase the likelihood of a block trade.

Hypothesis 4: The risk of a block trade is increasing in the large shareholder's separation of voting rights and cash flow rights.

The private benefits of control aren't easy to determine or quantify, therefore, it is very difficult to design an accurate proxy (Dyck and Zingales, 2004). Following the existing literature on corporate governance (e.g. Bebchuk, Kraakman, and Triantis, 1999; La Porta, Lopez-de-Silanes, and Shleifer, 2002), we use the wedge between voting rights and cash flow rights as a gauge on the ability/ incentive to extract private benefits. Claessens et al. (2002) use the wedge between voting rights and cash flow rights as a gauge on entrenchment. Furthermore, Morck et al. (2005) argue that entrenchment must stem from private benefits of control, i.e. if there are no private benefits of control the controlling shareholder has no incentives to entrench himself.

There are a number of other methods that have been used to measure private benefits. One proxy is the premium paid for a controlling block of shares (Barclay and Holderness, 1989; Dyck and Zingales, 2004). Needless to say, this proxy can only be constructed for firms that experience a block trade and cannot be used to predict a block trade. A second proxy for private benefits is the premium paid for voting shares when a company has both voting and non-voting shares (Nenova, 2003; Zingales, 1994). Although many Swedish firms have dual class shares, many of them would only have the low voting B-shares traded while the controlling owner would often keep all A-shares. Hence, in many cases it is impossible to measure the voting premium. Relying on this measure would reduce our sample size by roughly 75 percent. Furthermore, Rydqvist (1996) shows that the voting premium dramatically increases at control contests. It is likely that the voting premium would increase prior to public tender offers and block trades. Thus, the interpretation of this variable in terms of predicting public tender offers and block trades would be somewhat ambiguous. Empirical studies that attempt to measure the private benefits of control generally find that the "valuation" proxies for private benefits of control in Sweden are among the lowest in the world (see Nenova, 2003; Dyck and Zingales, 2004).

2.2. Sample Selection

We start with an unbalanced panel dataset containing accounting data for 211 large non-financial Swedish firms listed on the Stockholm Stock Exchange 1985-2001. The accounting data is collected from the Findata Trust database. The sample contains the vast majority of the largest non-financial public firms during this time-period. Some large firms that were only listed for one or two years before delisting are not included in the sample.

The accounting data is combined with ownership data from Sundqvist (1985-1993) and Sundin and Sundqvist (1994-2001). This source reports the 25 largest owners in all listed

firms as of January each year. Sundin and Sundqvist provide detailed information on coalition structures and families in a wide sense. Thus, if two families are known to cooperate their shareholdings are aggregated in Sundin and Sundqvist. We have followed their definitions of ownership coalitions.[4] After the collection of ownership data the sample is reduced to 200 firms and 1706 firm years.

To identify control block trades we collect information on the identity of the largest voteholder coalition each firm year. When there is a change in the identity of the largest voteholder we collect information about the change from Sundqvist (1985-1993), Sundin and Sundqvist (1994-2001) and the Affärsdata database. Affärsdata contains Swedish business articles and news from 1981 to today. It now covers 90 sources. We identify 119 control changes (change in the identity of the largest voteholder) in our sample and classify them as due to block trades (69 obs), reconstructions at financial distress (12 obs), accumulation of shares by an outsider by acquisitions of minority blocks and/ or open market trade (35 obs), and open market divestment by the controlling owner (3 obs). Since we are interested in control changes where the incumbent and an outsider negotiate the control transfer we focus on the 69 block trades. The other control changes do not involve a negotiated control transfer between the incumbent and the outsider gaining control.

We also identify 23 indirect control changes due to block trades (16 obs), non-partial takeover (2 obs), and accumulation of shares by an outsider (5 obs). We define a control change in firm B as indirect when there is a control change in firm A and firm A controls firm B. We do not define the indirect ownership change in firm B as control change (non-partial takeover or block trade) since the ownership in firm B does not change. The takeover activity within Swedish pyramids has been analyzed by Holmen and Knopf (2004) and Doukas et al. (2002).

[4] Bergström and Rydqvist (1990) used a similar principle for grouping Swedish shareholders into coalitions.

A first rough estimate of non-partial takeover activity is also collected from Sundin and Sundqvist (1986-2001) since they report all delistings. However, they do not distinguish between actual non-partial takeovers, minority buyouts, and going private transactions. We are only interested in transactions where there has been a change in control, i.e. not the minority buyouts and going private transactions. To separate going private transactions from actual non-partial takeovers we use daily newspapers.[5] We also examine the ownership structure of the firm the years preceding the delisting.

In Sweden, almost all non-partial takeovers are preceded by a public tender offer (Bergström and Rydqvist, 1989). According to Swedish law, any shareholder or group of shareholders in the target, who has 10% of the shares, can block a merger. Therefore, the terms of the tender offer are often negotiated between the bidder and the large shareholders of the target before the public announcement. When the large blockholders have accepted the terms of the bid, a follow-up tender offer is made for all target shares, including the blockholders' shares (Rydqvist, 1993). Most bids are non-partial and are contingent upon 90% of the shareholders accepting the offer. The fact that we only look at successful takeovers suggests that all takeovers in our sample are friendly.

Our final takeover sample consists of 47 successful non-partial tender offers. Seven successful tender offers were preceded by a block trade, i.e. an outsider acquired the controlling block from the incumbent and then made a tender offer for remaining shares. We classify these seven observations as block trades since control was transferred at the block trade, not at the tender offer. Thus, our final non-partial tender offer sample includes 40 observations. Together with the block trades, control changes due to financial distress, accumulation of shares by an outsider, and divestment in the open market we have 159 control changes of which 25 percent (40 of 159) are public tender offers. This is similar to the

[5] Part of this data was provided by Kristian Rydqvist.

27 percent reported by Schmid for the U.S. in year 2000. In our total sample 24 firms were subject to minority buyouts and four firms were delisted due to bankruptcy.

Table 1 panel A summarizes our sample. On average our sample contains roughly 100 firms each year and comprises roughly 70 percent of the Swedish stock market capitalization. On average 3 firms are taken over each year and 4 firms were subject to control block transfers each year.

2.3. Descriptive Statistics

In Table 2 we provide descriptive statistics for the 200 firms and 1706 firm years in our sample. The largest block of equity contains 29 percent of the firm's cash flow rights on average (*Unadj Equity*). When the controlling owners' net investment in the firm is adjusted for pyramid structures the average controlling owner holds 21 percent of the firm's cash flow rights. If firm B is controlled by firm A, *Equity* in firm B is adjusted for pyramid structures by multiplying the ultimate owner's fraction of cash flow rights in firm A with firm A's fraction of cash flow rights in firm B. This is in line with e.g. Claessens et al. (2002). However, we define equity ownership for the largest voteholder in each firm and do not use any cut off levels. Claessens et al (2002) define firms where no shareholder holds 10 percent of the voting rights as having dispersed ownership. In only 34 observations in our sample (less than 2% of the sample) is the largest voting block smaller than 10 percent. We control for holdings through multiple control chains according to Faccio and Lang (2002). The average ratio between *Equity* and *Unadj Equity* is 2.224. The median is 1.000 since less than 50 percent (31 percent) of the firms are part of a pyramid structures (see panel B). The average controlling owner holds almost 50 percent of the voting rights (*Votes*).[6] The difference in excess of

[6] We define *Votes* as the ultimate owner's fraction of voting rights in the firm independent of pyramid structures. Claessens et al. (2002) define *Votes* as the fraction of voting rights in the weakest link in terms of voting rights in the pyramid. We have run all our tests with Claessens et al.'s (2002) definition. *Votes* becomes smaller for about

pyramid structures is due to the high frequency of dual class shares. Seventy-nine percent of the firms in our sample have dual class shares (see panel B).The median controlling shareholder has almost 50 percent more voting rights than cash flow rights (*Votes/ Unadj Equity*) and twice as much voting rights as pyramid adjusted equity (*Votes/ Equity*).[7] The median controlling owner has been the largest voteholder for 11 years (*Tenure).*

We also define a cross-ownership dummy (unreported). For firm B it is equal to one if Firm A controls firm B and firm B owns shares in firm A, and zero otherwise. Only 82 observations in our sample (4.8%) were involved in cross-ownership. The hazard models reported in the next section do not include this variable since we are not aware of a technique to construct a continuous variable based on cross-ownership structures. The effect of dual class of shares and pyramid are measured as continuous variables since we want to capture the degree of separation, not just the existence of dual class shares and pyramids. We note, however, that including the cross-ownership dummy does not affect any of the other results and the dummy per se is insignificant in all models.

The median firm has assets with a book value of 1525 million SEK (*Size*), is 47 years old (*Age*), invests an amount equal to 8.5 percent of total assets (*Investment*), generates a return of 12.4 percent return on total assets (*Profitability*), has financed 23.7 percent of total assets with long term debt (*Leverage*), has 56.4 percent of total assets in short term assets (*Liquidity*), and has a *Tobin's q* of 1.146. *Tobin's q* is defined as the sum of the market value of equity and book value of total debt divided by the book value of total assets.

The sample is split by whether the firm was subject to a control change 1985-2000. Successful non-partial takeovers and block trades are defined as control changes. All years

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half of the pyramidal firms. The block trade results reported below are virtually unchanged. The tender offer results, however, become somewhat less significant statistically.

[7] Faccio and Lang (2002) and Giannetti and Simonov (2006) analyze the ratio of voting rights and cash flow rights. Claessens et al (2002) analyze the difference between voting rights and cash flow rights. In our empirical work we take the natural logarithm of the ratios in order to reduce the impact of extreme values. Using the differences generates similar but somewhat weaker results statistically.

within the same ownership spell (N=609) prior to a successful non-partial takeover or a block trade are classified as belonging to a firm experiencing a control change. An ownership spell is defined as all firm years with the same controlling owner. Thus, at control block transfers and other control changes, new ownership spells begin.[8] At a non-partial takeover the firm is delisted and no new ownership spell begins.

The median difference test suggests that the controlling owners in firms experiencing a control change have less voting rights (*Votes*) and cash flow rights after controlling for pyramid structures (*Equity*). There is no difference in equity ownership if we do not adjust for pyramid structures (*Unadj Equity*) since the separation between votes and capital, due to pyramid structures, (*Unadj Equity/ Equity*) is larger for firms experiencing control changes. The separation between votes and capital (*Votes/ Unadj Equity*) due to dual class shares does not differ between the subsamples. The total separation (*Votes/ Equity*) is larger in firms experiencing control changes.[9] The descriptive statistics does not suggest a significant relation between control tenure and control changes.

The firms experiencing control changes are of similar size and age as the firms not experiencing control changes. Firms experiencing control changes are less profitable than firms not experiencing control changes while there are no significant differences in terms of leverage and liquidity. The mean difference in terms *Tobin's q* is driven by extreme values – the median difference suggests no significant difference.

In panel B we report statistics for five binary variables. Two thirds of the firms in our sample have a family, an individual or a group of individuals as controlling shareholder (*Family*). A firm is classified as family-controlled when there is a traceable family or other

[8] We have 200 firms, 69 control block transfers, and 73 other ownership changes resulting in 342 ownership spells. The 69 block trades are related to 53 firms. Thus, some firms experienced more than one block trade during the sample period. Furthermore, 15 firms experienced a block trade before becoming a non-partial takeover target. Note, however, that if it is the shareholder gaining control by the block transfer who makes the non-partial tender offer for remaining shares, the tender offer is not classified as a takeover but as a going private transaction.

[9] Note that mean differences are tested on the natural logarithm of *Unadj. Equity/ Equity, Votes/ Unadj. Equity, Votes/ Equity, Tenure, Firm Size, Firm Age* and *Tobin's q*.

group of individuals who ultimately controls the largest voting block of shares in the corporation.[10] Admittedly, in firms with a passive financial institution as the largest shareholder, a family with the second largest voting block may still hold a considerable influence. However, when a financial institution is the largest shareholder, typically the other large shareholders are also financial institutions and there are no families among the largest shareholders. Furthermore, even when a financial institution is the largest vote holder, its vote fraction is generally much smaller than for controlling families. Thus, even if a family would be the second largest vote holder, the family's vote fraction would on average be only half of families being the largest vote holder.

The case for aggregating the ownership of different ownership categories (independent of coalitions structures), when classifying firms into different ownership types, is less strong since the Swedish corporate law does not allow for cumulative voting when the board of directors is elected (La Porta *et al*.,1998). Thus, different families can cast their votes on the same candidates when the board of directors is elected, but a certain family cannot cast all its votes on a particular candidate.

Almost 80 percent of the firms have dual class shares. In 28.2 percent of the firms, the controlling shareholders hold all A-shares and only the B-shares are traded on the Stockholm Stock Exchange. In roughly 40 percent of the dual class firms the controlling shareholder holds all A-shares. Thirty one percent of the firms are controlled by a pyramid structure and in 43 percent of the firms the second largest shareholder holds at least 10 percent of the voting rights. Family firms (dual class firms and pyramid firms) are less (more) likely to experience a control change according to a simple proportion test. Finally, an outside block holder increases the probability that the firm will experience a control change.

[10] Consistent with the Holderness and Sheehan's (1988) study of the role of majority shareholders in publicly held corporations for firms where the largest shareholder is a family or other group of individuals, we don't distinguish between managerial and non-managerial shareholders (the vast majority of the family owners are insiders).

In panel C the firms experiencing a control change are split by whether they are non-partial takeover targets or subject to control block transfers. All ownership spells prior to the non-partial takeover and block trades, respectively are classified accordingly. The difference tests indicate that ownership spells associated with non-partial takeover have more unadjusted equity voting rights, vote to equity ratio, longer control tenure, and larger, older, and more profitable firms compared to ownership spells subject to control block transfers. Furthermore, the difference tests in panel D indicate that non-partial takeover targets are more likely to be family firms, dual class firms, pyramid firms, and it is more likely that the controlling owners holds all A-shares compared to ownership spells associated with control block transfers.

3. Survival analysis methodology

Survival analysis methodology is well-suited to analyses of factors explaining the likelihood of a change in firm's control (e.g. Cameron and Trivedi, 1996).[11] In our context, the changes in control constitute an instance of competing risks.[12] We choose to look at two competing risks - the change in the controlling owner of a firm due to transfer of the controlling block of shares and the change due to non-partial tender offers. The observation "spell" for a firm is a time until change in the controlling owner or the end of the observation period. Therefore, the spells ending up with a control transfer due to causes other than block trade or tender offer are treated as censored resulting in the beginning of a new observation spell for the firm. As a result, at each point in time within a spell firms can be considered to be in one of the three mutually-exclusive states - the status-quo state, the state of takeover, and the state of block trade. Over time, all firms are exposed to a chance of transiting from the status-quo state to one of the two alternative states – block trade or takeover.

[11] Survival analysis deals with the modelling of time-to-event data, also known as transition data (or survival time data or duration data). Comprehensive treatments of these models can be found in Cox and Oakes (1984), Lancaster (1990), and Blossfeld and Rohwer (1995).

[12] One should note that the absence of control change can be considered as a residual risk.

For the present analysis we adopt an independent competing risks specification. In an independent competing risks model, the hazard associated with a takeover is assumed to be independent from that of a block trade, conditional on the effects of the independent variables.[13] Estimation of an independent competing risks model is thus exactly equivalent to estimation of separate models for each risk, while treating control transfers due to the other risk(s) and the situations of no control transfer as censored.[14]

The advantage of the adopted methodology over more traditional Ordinary Least Squares or multinomial regressions is the ability of the survival analysis to directly account for the sequential nature of the data, and its ability to handle censoring and incorporate time-varying covariates (Jenkins, 2005).

In our approach, the hazard rate captures the chances of takeover or block trade within a year conditional on survival (no such event) up to that point.

The unconditional probability of not experiencing event k (where k is takeover or block trade) from the start of the observation period (t=0) until time $t>0$ for firm i in our sample is equal to $\lambda_{ik}(t)dt$, where $\lambda_{ik}(t)$ is the hazard function defined by the equation

$$\lim_{dt\to 0^+} \frac{\Pr\left[t+dt \geq T_i \geq t \,\middle|\, T_i \geq t\right]}{dt} = \lambda_{i\,k}(t)$$

and dt is an infinitesimal interval of time. Alternatively, $\lambda_{ik}(t)dt$ can be interpreted as an unconditional probability of a firm i experiencing an event in tiny interval of time $[t, t+dt]$.

[13] An important advantage of independent competing risks models is their computational tractability. Extensions to allow for correlated risks have been introduced in the literature, but have not been used much in applied work yet. In fact, the assumption of conditional independence is not very unrealistic given that if a particular covariate affects the hazard of more than one event, and it is in the model, then its effect is "controlled for". We use a large number of covariates, many of which vary with or are a function of time, which would likely mitigate the potential conditional dependence between the risks involved. In addition, if we assume that the dependence is due to a common unit effect, the inclusion of "unobserved heterogeneity" term in our models would also ensure conditional independency of risks.

[14] For continuous time models, the log-likelihood for a model with multiple destinations has a separability property meaning that one can estimate a multiple-destination survival model by estimating a number of single-destination models separately, one for each destination (competing risk). With the discrete data, like in our case, an independent competing risk model can still be estimated by setting up the likelihood function as the likelihood for a standard multinomial logit model applied to re-organised data (Allison, 1982). For interval-censored data with relatively small interval hazard it is common to assume that the continuous time hazard rate was constant within each interval.

The (instantaneous) hazard rate function for firm *i* at time $t>0$ is assumed to take the proportional hazards form

$$\lambda_{ik}(t) = \lambda_{0k}(t)\exp(X_{it}'\beta)$$

where $\lambda_{0k}(t)$ is the unknown baseline hazard at time *t* which may take a parametric or non-parametric form, and X_{it} is a vector of covariates summarizing observed differences between firms at time *t*; and β is a vector of parameters to be estimated.

Note that the probability density function in our context is a time to failure function that gives the instantaneous probability of the event. That is, in a survival experiment where the event is firm takeover, the value of the density function at time T is the probability that a firm will be taken over precisely at time T. This differs from the hazard function, which gives the probability conditional on a firm having survived to time T.[15]

Although survival of firms occurs in continuous time, our data calls for the discrete time specification of the model given that the spell length is observed only in one-year intervals. In other words, the underlying continuous durations are only observed in disjoint time intervals $[0 = a_0, a_1)$, $[a_1, a_2)$, $[a_2, a_3)$, … , $[a_{k-1}, a_k = \infty)$. Our covariates (e.g. firms' characteristics) may vary between time intervals but are assumed to be constant within each of them.

In the discrete case, hazard of exit to a particular destination *k* in the *j*th interval is given by

$$h_{jk}(X_{it}) = \Pr\{T \in [a_{j-1}, a_j) \mid T > a_{j-1}\}$$

In our case all intervals have length of one year, so the recorded duration for each firm *i* corresponds to the interval $[t_{i-1}, t_i)$. Firms are recorded as either experiencing takeover or block trade during the interval, or as still is remaining in status-quo. The former group,

[15] In this paper we use the terms "hazard rate of takeover/block trade" or "takeover/block trade risk" instead of "takeover/block trade probability" since what we model is the probability per time unit that a firm that has survived to the beginning of the respective interval will be taken over or the controlling shareholder will sell her block of shares in that interval.

contributing completed spell data, are identified using censoring indicator c_i=1. For the latter group, contributing right-censored spell data, c_i=0. The number of intervals comprising a censored spell is defined here to include the last interval within which the firm is observed.

The log-likelihood for each event *k* can be written in terms of the hazard function as:

$$LogL_k = \sum_{i=1}^{n} \left\{ c_i \log \left\{ h_{ikt}(X_{ikt_i}) \prod_{s=1}^{t_i-1} [1 - h_{sk}(X_{is})] \right\} + (1 - c_i) \log \left\{ \prod_{s=1}^{t_i} [1 - h_{sk}(X_{is})] \right\} \right\}$$

where the discrete time hazard in the *j*th interval is

$$h_{jk}(X_{ij}) = 1 - \exp\left[-\exp(X_{ij}'\beta + \gamma_{jk}) \right] \text{ with } \gamma_{jk} = \log \int_{a_{j-1}}^{a_j} \lambda_{0k}(\tau) d\tau .$$

This specification allows for a fully non-parametric baseline hazard with a separate parameter for each duration interval. Alternatively, the γ_{jk} may be described by some semi-parametric or parametric function, e.g. $\theta_k(j)$.

If we define an indicator variable y_{ikt}=1 if firm *i* experienced an event during the interval [*t-1,t*], and y_{ikt}=0 otherwise, then the log-likelihood can be rewritten in sequential binary response form:

$$\log L_k = \sum_{i=1}^{n} \sum_{j=1}^{t_i} \left\{ y_{ikj} \log h_{jk}(X_{ij}) + (1 - y_{ikj}) \log \left[1 - h_{jk}(X_{ij}) \right] \right\}$$

This is one specification of log-likelihood, which we estimate for each event.

Our second specification incorporates a Gamma distributed random variables to describe unobserved (or omitted) heterogeneity between individuals.

The instantaneous hazard rate is now specified as

$$\lambda_{ik}(t) = \lambda_{0k}(t) \varepsilon_i \exp(X_{it}'\beta_k) = \lambda_{0k}(t) \exp(X_{it}'\beta_k + \log(\varepsilon_i))$$

where ε_i is a Gamma distributed random variable with unit mean and variance $\sigma^2 \equiv v$, and the discrete-time hazard function is now

$$h_{jk}(X_{ij}) = 1 - \exp\left[-\exp(X_{ij}'\beta_k + \gamma_{jk} + \log(\varepsilon_i)) \right]$$

The likelihood functions of the second model are:

$$LogL_k = \sum_{i=1}^{n} \log\{(1-c_i)A_{ik} + c_i B_{ik}\}$$

where

$$A_{ik} = \left[1 + v\sum_{j=1}^{t_i} \exp\left[X_{ij}'\beta_k + \theta_k(j)\right]\right]^{-(1/v)} \text{ and}$$

$$B_{ik} = \left[1 + v\sum_{j=1}^{t_i-1} \exp\left[X_{ij}'\beta_k + \theta_k(j)\right]\right]^{-(1/v)} - A_i, \text{ if } t_i > 1, \text{ or} = 1 - A_i, \text{ if } t_i = 1$$

where $\theta_k(j)$ is a function describing duration dependence in the hazard rate. The first model's log-likelihood function is the limiting case as $v \to 0$.

4. Empirical Results

In this section we report the results of estimation of discrete time proportional hazards regression models with the hazard rate of control changes as dependent variable.[16] We first combine the non-partial takeover and block trade events. In section B and C we then estimate competing risk models for non partial takeover and block trades, respectively.

A. *The probability of a control change*

In this section we estimate the risk of control changes using the hazard regressions models. We include several independent variables. Our first two hypotheses deal with the ownership fraction of the largest shareholder and we therefore include the largest shareholder's voting fraction (*Votes*). Two capture the effect of separation of voting rights from cash flow rights we include two variables. The effect of dual class shares is captured by the natural logarithm

[16] The models are estimated using pgmhaz8 procedure of STATA 8.2. For each specification, two models are estimated by maximum likelihood methods: (1) the Prentice-Gloeckler (1978) model; and (2) the Prentice-Gloeckler (1978) model incorporating a gamma mixture distribution to summarize unobserved individual heterogeneity, as proposed by Meyer (1990). We estimate fully non-parametric specification for the baseline hazard with four interval-specific baseline hazards.

of the ratio of the largest shareholder's vote fraction and the unadjusted equity fraction (*Ln(Votes/ Unadj Equity*)). The effect of pyramid structures is captured by the natural logarithm of the ratio between largest shareholder's unadjusted equity fraction and the pyramid adjusted equity fraction (*Ln(Unadj Equity/ Equity*)). We split the total separation into two parts in order to investigate whether dual class and pyramids indeed are perfect substitutes empirically or whether they have different implications in terms of the market for corporate control (see Attig et al., 2003; Faccio and Lang, 2002).

Families most likely hold under-diversified portfolios to a larger extent than non-family owners. They therefore have incentive to sell their control block and diversify their portfolios. However, families most likely derive more non-transferable private benefits of control than non-family owners. This would suggest that they have less incentive to sell their control block since they will not be compensated for non-transferable private benefits. It is an empirical question whether the incentives to diversify the family's portfolio is stronger than the incentives to hang on to the private benefits of control. We therefore include a *Family* dummy variable in all estimated models. It is equal to one if a family, an individual or a group of individuals control the firm, and zero otherwise.

Based on Stulz (1988) we test whether firm *Leverage* is related to the hazard rate of control changes. By increasing firm leverage the controlling shareholder can increase his control of voting rights and thereby hindering takeovers. *Firm Size*, *Investment* level, *Profitability* (ROA), *Liquidity*, and an *Outside Block* Dummy are included as control variables. These are roughly the same control variables as the variables used by e.g. Palepu (1986), Ambrose and Megginson (1992), and Dickerson *et al.* (2002) when estimating the probability of takeovers. Bohren et al (2005) show that the probability that a shareholder will

close an equity position is a function of how long the owner has held this position. Based on this we also include the largest shareholder's control *Tenure* as an independent variable.[17]

The results of a model for the pooled hazards of takeovers and block trades are reported in Table 3. The higher the controlling owner's voting fraction the smaller the probability of a control change (in M1 and M3). This is contrast to Shleifer and Vishny (1986). However, they consider public tender offers, not control changes in general. We return to this issue below. We do not find any non-linear relation between the largest shareholder's voting fraction and the probability of a control change (in M3 and M4). Morck et al. (1988) and McConnell and Servaes (1990) have documented non-linear relation between managerial ownership and firm performance. The results do not indicate that separation of voting rights from cash flow rights affect the probability of a control change. Larger firms are less likely to experience control changes. All other control variables are insignificant.

B. The probability of a non-partial takeover

To investigate our hypotheses on the difference in the effects of factors determining the hazard of takeovers and block trades we estimate competing risk models separating the two control changing events. We first analyze the tender offers. The results are reported in Table 4. We use the same independent variables as in the previous section. In M1 and M3 we do not find any support for our first hypothesis that the likelihood of public tender offers increases with the largest shareholder's ownership fraction. However, controlling for a non-linear relation between ownership and the likelihood of a public tender offer by including *Votes Squared* the results indicate the likelihood of a public tender offer indeed increases with the largest shareholder's ownership fraction. The likelihood of public takeovers increases up the inflection point at roughly 54 percent. We interpret the negative sign on the squared term as if

[17] In all estimated models we have substituted *Tenure* with firm age. The results are virtually unchanged. Since the variables are highly correlated we do not use both the estimations.

the relation becomes flat, not necessarily negative, above 54 percent. Interestingly, the inflection point is not statistically different from 50 percent. Both Shleifer and Vishny (1986) and Burkart et al. (2000) model 50 percent as sufficient for absolute control and argue that higher ownership stakes are motivated by other reasons such as tax laws and synergy effects.

When we allow for a non-linear relation between ownership and the likelihood of public tender offers the variable capturing the effect of dual class shares (*Ln(Votes/ Unadj Equity*)) becomes significantly negative. This result is in line with our third hypothesis. The larger the private benefits, approximated by the separation of voting rights from cash flow rights, the less likely is an event of a public tender offer (Burkart et al., 2000). Furthermore, it appears as if dual class shares work as an anti-takeover device (Grossman and Hart, 1988; Jarrell and Poulsen, 1988).

The pyramid variable (*Ln(Unadj Equity/ Equity*)), however, is positively significant. Thus, a larger pyramidal wedge leads to higher takeover risk. It is important to mention that takeovers within the same pyramid are not included among the public tender offers since they are defined as going private transactions. Takeovers within the pyramids do not result in a change in the identity of the controlling owner. Thus, it appears as if dual class shares and pyramids are not perfect substitutes in terms of the market for corporate control. In fact, the have the opposite significant signs in our tender offer model. Dual class shares appear to be used, as least partly, as a takeover defence. Pyramids, on the other hand, might be used in order to facilitate tunnelling or to exploit a comparative financial advantage (Bertrand et al., 2002); Holmen and Hogfeldt, 2005). Consistent with Stulz (1988), leverage is negatively significant in the tender offer model. All other variables are insignificant.

C. The probability of a block trade

We now turn to the block trades. The same models are estimated with the risk of a control block transfer as dependent variable. The results are reported in table 5. Consistent with our second hypothesis, the largest shareholder's voting fraction significantly reduces the likelihood of a block trade (see M1 and M3). This relation is not non-linear (see M2 and M4). Furthermore, the separation of voting rights due to dual class shares is positively significant, consistent with our fourth hypothesis. Again the results for the pyramid variable (*Ln(Unadj Equity/ Equity)*) is different from the dual class shares variable. It is insignificantly negative. Thus, also in terms on block trades it appears as if pyramids and dual class shares have different implications.

The family indicator variable is negatively significant in all four models. While family firms might be associated with more private benefits, some of the private benefits in family firms are not transferable to outsiders. For example, having a large listed firm carrying the family name is associated with benefits for the founding family (Barclay, Holderness, and Pontiff, 1993). However, these benefits are most likely not transferable to a new owner. Therefore, the negative relation between family control and the likelihood of a block trade is not necessarily inconsistent with the conjecture that block trades are more likely when the private benefits are larger.

Larger firms are less likely to experience block trades and there are some weak evidence that profitable firms are less likely to experience a block trade. The other control variables are insignificant.

To sum up, our results indicate the importance of considering the control transfers through takeovers and block trades as two distinctive events. The determinants of the likelihood of the two events differ significantly and pooling these events in a single model would lead to obscuring the information conveyed by a choice of a transfer mode (Burkart et al., 2000). The likelihood of a public tender offers (block trade) increases (decreases) with the

largest shareholder's ownership stake. Additionally, the likelihood of a public tender offer (block trade) decreases (increases) with the use of dual class shares. Burkart el al. (2000) argue that private benefits will increase the likelihood of block trades relative to public tender offers. Thus, the results are consistent with our general hypothesis that the security and private benefits tend to be substitutes with private benefits proportionately increasing with a decrease in a controlling ownership stake and with an increase in a wedge between cash flow and control rights. Finally, it appears as if pyramids and dual class shares have different empirical implications in terms of the market for corporate control.

5. Conclusion

In this paper we attempt to fill in the gap in the corporate control literature by investigating the effect of the size and structure of controlling party's equity position on the choice of control transfer mode. Following Burkart et al. (2000), we argue that the choice between block trade and tender offer transfer modes is likely to be significantly affected by interdependence of security benefits and private benefits attached to controlling ownership stake. Given that private benefits tend to be internalized in a non-partial takeover of the company the incentive of this transfer mode would be lower relative to the block trade when the private benefits are large. We argue that the magnitude of private benefits is likely to increase relative to security benefits when the controlling owner has a smaller stake in a company and when she enjoys more control rights relative to cash flow rights (e.g. through the use of dual class shares). Our results support this conjecture. The likelihood of a public tender offers increases with the largest shareholder's ownership stake while the opposite true for the probability of the block trade transaction. Moreover, the greater proportion of control rights to cash flow rights of a controlling owner positively affects the likelihood of block trade and has a negative effect on the probability of a tender offer.

Overall, we emphasize the importance of investigating block trades and tender offers as two competing events. Combining these control change events in a single model would lead to obscuring the information conveyed by a choice of a transfer mode.

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Table 1. *Frequency of successful tender offers and control block transfers among large Swedish non-financial firms listed on the Stockholm Stock Exchange 1985-2000*

Year	1. Number of Sample Firms	2. Percentage of market capitalization	3. Number of non-partial Takeovers of Sample Firms	4. Percentage of Sample Firms being taken over	5. Number of Block Trades in Sample Firms	6. Percentage of Sample Firms subject to Control Block Trades
1986	80	60.3	0	0.0	3	3.7
1987	89	70.7	1	1.1	3	3.4
1988	91	66.9	1	1.1	3	3.3
1989	88	60.1	1	1.1	2	2.3
1990	95	73.1	2	2.1	2	2.1
1991	95	70.1	2	2.1	5	5.3
1992	92	71.2	1	1.1	4	4.3
1993	93	72.8	2	2.1	10	10.7
1994	95	78.4	2	2.1	1	1.1
1995	110	81.1	0	0.0	4	3.6
1996	118	78.3	5	4.2	7	5.9
1997	133	81.2	5	3.7	10	7.5
1998	141	75.6	1	0.7	5	3.5
1999	140	70.5	12	8.5	3	2.1
2000	127	53.0	6	4.6	7	5.5
2001	119	70.5	6	5.0	0	0.0

Note: In this table we provide statistics on the number of sample firms, the frequency of successful non-partial tender offers, and control block transfers among Swedish non-financial firms listed on the Stockholm Stock Exchange 1986-2001. The sample consists of 200 firms and 1706 firm years. 40 firms were subject to successful non-partial tender offers and 69 firms experienced control block transfers.

Table 2. *Descriptive statistics large Swedish non-financial firms 1985-2000*

Panel A: Continuous variables

	Total Sample, N=1706		No Change of controlling owner, N=1097		Change of controlling owner, N=609		Difference	
	Mean	Median	Mean	Median	Mean	Median	t-test	Ranksum test
Unadj. Equity	0.323	0.290	0.330	0.300	0.314	0.270	1.596	1.343
Equity	0.258	0.210	0.271	0.220	0.235	0.180	3.453***	3.396***
Unadj Equity/ Equity[1]	2.224	1.000	2.138	1.000	2.380	1.000	-3.296***	-3.807***
Votes	0.489	0.490	0.506	0.510	0.471	0.450	2.935***	3.133***
Votes/ Unadj Equity[1]	1.927	1.468	1.989	1.500	1.816	1.403	1.453	1.317
Votes/ Equity[1]	4.356	1.904	4.570	1.786	3.970	2.193	-1.938*	-3.187***
Tenure[1]	26	11	26	12	28	9	1.352	1.206
Firm Size[1]	9561	1525	9196	1386	10220	2006	-0.521	-0.800
Firm Age[1]	59	47	55	48	66	45	0.662	-0.544
Investment	0.112	0.085	0.110	0.083	0.116	0.088	-1.210	-0.589
Profitability	0.081	0.124	0.039	0.039	0.030	0.032	2.104**	2.908***
Leverage	0.261	0.237	0.264	0.232	0.256	0.238	0.923	0.018
Liquidity	0.539	0.564	0.539	0.553	0.540	0.583	-0.108	-0.672
Tobin's q[1]	1.538	1.146	1.594	1.145	1.436	1.149	1.673*	0.158

[1] mean difference tested on the natural logarithm of these variables.

Panel B: Binary variables

	Total Sample, N=1706	No Change of controlling owner, N=1097	Change of controlling owner, N=609	Difference
	Proportion	Proportion	Proportion	Proportion test
Family	0.673	0.730	0.598	5.633***
Dual Class Shares	0.789	0.773	0.819	-2.251**
Controlling owner holds all A-shares	0.282	0.289	0.271	0.793
Pyramid	0.310	0.274	0.374	-4.278***
Outside Block	0.432	0.403	0.484	-3.255***

Panel C: Comparison firms subject to non-partial takeovers and firms subject to control block transfers (Continuous variables)

	Non-partial Takeover Targets, N=300		Firms Subject to Control Block Transfers, N=309		Difference	
	Mean	Median	Mean	Median	t-test	Ranksum test
Unadj. Equity	0.336	0.300	0.292	0.240	2.947***	3.796***
Equity	0.232	0.179	0.239	0.190	-0.455	-0.893
Unadj Equity/ Equity[1]	2.839	1.000	1.935	1.000	5.716***	5.309***
Votes	0.502	0.480	0.442	0.410	3.267***	-3.281***
Votes/ Unadj Equity[1]	1.644	1.396	1.983	1.428	-3.051***	-1.591
Votes/ Equity[1]	4.322	3.039	3.628	1.908	3.481***	3.761***
Tenure[1]	36	21	19	6	6.053***	5.904***
Firm Size[1]	9550	3142	10871	1197	4.456***	4.655***
Firm Age[1]	84	65	48	34	5.927***	5.436***
Investment	0.102	0.086	0.131	0.091	-3.197***	1.392
Profitability	0.039	0.035	0.021	0.028	2.776***	2.814***
Leverage	0.258	0.249	0.254	0.228	0.261	0.910
Liquidity	0.542	0.585	0.539	0.583	0.181	0.096
Tobin's q[1]	1.362	1.155	1.509	1.144	-0.574	0.510

[1] mean difference tested on the natural logarithm of these variables.

Panel D: Comparison firms subject to non-partial takeovers and firms subject to control block transfers (Binary variables)

	Non-partial Takeover Targets, N=300	Firms Subject to Control Block Transfers, N=309	Difference
	Proportion	Proportion	Proportion test
Family	0.690	0.500	4.577***
Dual Class Shares	0.853	0.786	-2.146**
Controlling owner holds all A-shares	0.343	0.200	3.961***
Pyramid	0.480	0.272	5.306***
Outside Block	0.483	0.485	-0.052

Note: In this table we provide summary statistics for the 200 firms and 1706 firm years in our sample. In panel A and B the sample is split by whether the firm was subject to a successful non-partial tender offer or a control block transfer 1985-2000. All ownership spell years (N=609) prior to the successful non-partial takeover or control block transfer are classified as change of controlling owner. In Panel C and D the sample of firms experiencing changes in controlling ownership are split by whether the firm was subject to a non-partial takeover or a control block transfer. All ownership spell years prior to the event are classified as non-partial takeover targets or firms subject to control block transfers, respectively. *Unadj. Equity* is defined as the controlling shareholder's (largest voteholder) fraction of cash flow rights in the firm, unadjusted for pyramid structures. *Equity* is defined as the controlling shareholder's (largest voteholder) fraction of cash flow rights in the firm, adjusted for pyramid structures. *Votes* is defined as the controlling shareholder's fraction of voting rights in the firm. *Tenure* is defined as the number of years the controlling shareholder has been the largest voteholder in the firm. *Firm Size* is defined as the book value of total assets in Million SEK. *Firm Age* is defined as the number of years since the firm was founded. *Investment* is defined as total capital expenditure divided by the book value of total assets. *Profitability* is equal to Earnings Before Interest, Taxes, and Depreciation (EBITD) divided by the book value of total assets. *Leverage* is equal to the value of long term debt divided by the book value of total assets. *Liquidity* is equal to the value of short term assets divided by the book value of total assets. *Tobin's q* is defined as the sum of market value of equity and book value of debt divided by the book value of total assets. *Family* is equal to one if the ultimate controlling shareholder is a family, an individual, or a group of individuals, and zero otherwise. *Dual Class Shares* is equal to one if the firm has issued shares with differential voting rights, and zero otherwise. *Controlling owner holds all A-Shares* is equal to one if the controlling owner holds all A-shares (high voting shares) and zero otherwise. *Pyramid* is equal to one if the firm is controlled by a pyramid structure (i..e the largest voteholder is another listed firm), and zero otherwise. *Outside Block* is equal to one if the second largest shareholder holds at least 10 percent of the voting rights, and zero otherwise. Median

Difference tested by means of Wilcoxon- Ranksum test. *** Significant at the 1% level; ** Significant at the 5% level; * Significant at the 10% level.

Table 3. *Estimated models of the hazard rate of a control change*

	M1	M2	M3	M4
	Without Unobserved Heterog		Gamma Dist. Unobserved Heterog	
Votes	-0.93*	0.10	-0.96*	0.36
	(0.52)	(2.08)	(0.55)	(2.25)
Votes Squared		-1.12		-1.44
		(2.20)		(2.38)
Ln(Votes/ Unadj Equity)	0.16	0.14	0.20	0.18
	(0.20)	(0.20)	(0.22)	(0.23)
Ln(Unadj Equity/ Equity)	0.14	0.14	0.14	0.13
	(0.14)	(0.14)	(0.15)	(0.15)
Family	-0.32	-0.32	-0.33	-0.33
	(0.22)	(0.22)	(0.24)	(0.24)
Leverage	-0.33	-0.34	-0.26	-0.26
	(0.62)	(0.62)	(0.67)	(0.68)
Ln(Firm Size)	-0.13**	-0.13**	-0.14*	-0.14*
	(0.07)	(0.07)	(0.07)	(0.07)
Profitability	-1.30	-1.29	-1.31	-1.30
	(0.89)	(0.88)	(0.94)	(0.94)
Investment	0.15	0.15	0.02	0.00
	(0.89)	(0.89)	(0.93)	(0.94)
Liquidity	-0.53	-0.49	-0.55	-0.49
	(0.51)	(0.52)	(0.54)	(0.55)
Ln(Tobin's q)	0.00	0.01	-0.01	0.00
	(0.22)	(0.22)	(0.23)	(0.24)
Ln(Tenure)	-0.01	-0.01	-0.01	-0.01
	(-0.00)	(-0.00)	(-0.00)	(-0.00)
Outside Block	0.19	0.15	0.22	0.17
	(0.20)	(0.21)	(0.22)	(0.23)

Note: In this table we report models estimating the hazard rate of the firm being subject to a control change. The sample consists of 200 firms and 1706 firm years. 40 firms were subject to successful non-partial tender offers and 69 firms were subject to negotiated control block transfers. We report models without unobserved heterogeneity (M1 and M3) and with Gamma distributed unobserved heterogeneity (M2 and M4), respectively. Coefficients are reported with standard errors in parenthesis. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. *Votes* is defined as the controlling shareholder's fraction of voting rights in the firm. *Unadj. Equity* is defined as the controlling shareholder's (largest voteholder) fraction of cash flow rights in the firm. *Equity* is defined as the controlling shareholder's (largest voteholder) fraction of cash flow rights in the firm, adjusted for pyramid structures. *Family* is equal to one if the ultimate controlling shareholder is a family, an individual, or a group of individuals, and zero otherwise. *Leverage* is equal to the value of long term debt divided by the book value of total assets. *Firm Size* is defined as the book value of total assets in Million SEK. *Firm Age* is defined as the number of years since the firm was founded. *Investment* is defined as total capital expenditure divided by the book value of total assets. *Profitability* is equal to Earnings Before Interest, Taxes, and Depreciation (EBITD) divided by the book value of total assets. *Liquidity* is equal to the value of short term assets divided by the book value of total assets. *Tobin's q* is defined as the sum of market value of equity and book value of debt divided by the book value of total assets. *Outside Block* is equal to one if the second largest shareholder holds at least 10 percent of the voting rights, and zero otherwise. The duration dependency of hazard rate is captured by four dummy variables corresponding to four-year duration intervals. Ln denotes the natural logarithm.

Table 4. *Estimated models of the hazard rate of a successful non-partial tender offer*

	M1	M2	M3	M4
	Without Unobserved Heterog		Gamma Dist. Unobserved Heterog	
Votes	0.95	8.31**	0.95	9.72*
	(0.86)	(4.17)	(0.86)	(5.19)
Votes Squared		-7.44*		-8.70*
		(4.10)		(5.01)
Ln(Votes/ Unadj Equity)	-0.6	-0.74*	-0.6	-0.78*
	(0.38)	(0.40)	(0.38)	(0.46)
Ln(Unadj Equity/ Equity)	0.43**	0.42**	0.43**	0.38
	(0.21)	(0.21)	(0.21)	(0.24)
Family	0.31	0.26	0.31	0.26
	(0.38)	(0.38)	(0.38)	(0.42)
Leverage	-2.62**	-2.76**	-2.62**	-3.11**
	(1.13)	(1.14)	(1.13)	(1.44)
Ln(Firm Size)	0	0.02	0	0.05
	(0.11)	(0.11)	(0.10)	(0.13)
Profitability	0.32	0.24	0.32	0.02
	(2.35)	(2.32)	(2.34)	(2.35)
Investment	-2.76	-2.5	-2.76	-2.8
	(2.41)	(2.39)	(2.41)	(2.60)
Liquidity	0.16	0.4	0.16	0.48
	(0.88)	(0.89)	(0.88)	(1.01)
Ln(Tobin's q)	-0.02	0.04	-0.02	0.02
	(0.37)	(0.36)	(0.37)	(0.41)
Ln(Tenure)	-0.01	-0.01	-0.01	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)
Outside Block	0.58	0.3	0.58	0.3
	(0.36)	(0.38)	(0.36)	(0.40)

Note: In this table we report models estimating the hazard rate of the firm being subject to a successful non-partial tender offer. The sample consists of 200 firms and 1706 firm years. 40 firms were subject to successful non-partial tender offers.. We report models without unobserved heterogeneity (M1 and M3) and with Gamma distributed unobserved heterogeneity (M2 and M4), respectively. Coefficients are reported with standard errors in parenthesis. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. *Votes* is defined as the controlling shareholder's fraction of voting rights in the firm. *Unadj. Equity* is defined as the controlling shareholder's (largest voteholder) fraction of cash flow rights in the firm. *Equity* is defined as the controlling shareholder's (largest voteholder) fraction of cash flow rights in the firm, adjusted for pyramid structures. *Family* is equal to one if the ultimate controlling shareholder is a family, an individual, or a group of individuals, and zero otherwise. *Leverage* is equal to the value of long term debt divided by the book value of total assets. *Firm Size* is defined as the book value of total assets in Million SEK. *Firm Age* is defined as the number of years since the firm was founded. *Investment* is defined as total capital expenditure divided by the book value of total assets. *Profitability* is equal to Earnings Before Interest, Taxes, and Depreciation (EBITD) divided by the book value of total assets. *Liquidity* is equal to the value of short term assets divided by the book value of total assets. *Tobin's q* is defined as the sum of market value of equity and book value of debt divided by the book value of total assets. *Outside Block* is equal to one if the second largest shareholder holds at least 10 percent of the voting rights, and zero otherwise. The duration dependency of hazard rate is captured by four dummy variables corresponding to four-year duration intervals. Ln denotes the natural logarithm.

Table 5. *Estimated models of the hazard rate of a negotiated control block transfer*

	M1	M2	M3	M4
	Without Unobserved Heterog		Gamma Dist. Unobserved Heterog	
Votes	-2.13***	-3.43	-2.16***	-3.42
	(0.69)	(2.53)	(0.71)	(2.63)
Votes Squared		1.47		1.42
		(2.75)		(2.86)
Ln(Votes/ Unadj Equity)	0.55**	0.58**	0.60**	0.62**
	(0.23)	(0.24)	(0.27)	(0.27)
Ln(Unadj Equity/ Equity)	-0.09	-0.09	-0.08	-0.08
	(0.20)	(0.20)	(0.21)	(0.21)
Family	-0.54**	-0.55**	-0.56*	-0.57*
	(0.27)	(0.27)	(0.30)	(0.29)
Leverage	0.97	0.98	1.14	1.13
	(0.77)	(0.77)	(0.89)	(0.88)
Ln(Firm Size)	-0.20**	-0.20**	-0.20**	-0.20**
	(0.09)	(0.09)	(0.09)	(0.09)
Profitability	-1.46	-1.48	-1.55	-1.56
	(0.94)	(0.94)	(1.03)	(1.03)
Investment	0.96	0.96	0.83	0.85
	(0.93)	(0.93)	(0.99)	(0.99)
Liquidity	-0.80	-0.84	-0.78	-0.82
	(0.64)	(0.64)	(0.67)	(0.67)
Ln(Tobin's q)	-0.02	-0.02	-0.01	-0.02
	(0.28)	(0.28)	(0.29)	(0.29)
Ln(Tenure)	0.00	0.00	0.00	0.00
	(0.01)	(0.01)	(0.01)	(0.01)
Outside Block	-0.04	0.01	0.00	0.04
	(0.25)	(0.27)	(0.27)	(0.29)

Note: In this table we report models estimating the hazard rate of the firm being subject to a negotiated control block transfer. The sample consists of 200 firms and 1706 firm years. 69 firms were subject to negoatiated control block transfers. We report models without unobserved heterogeneity (M1 and M3) and with Gamma distributed unobserved heterogeneity (M2 and M4), respectively. Coefficients are reported with standard errors in parenthesis. ***, **, and * denote significance at the 1%, 5%, and 10% level, respectively. *Votes* is defined as the controlling shareholder's fraction of voting rights in the firm. *Unadj. Equity* is defined as the controlling shareholder's (largest voteholder) fraction of cash flow rights in the firm. *Equity* is defined as the controlling shareholder's (largest voteholder) fraction of cash flow rights in the firm, adjusted for pyramid structures. *Family* is equal to one if the ultimate controlling shareholder is a family, an individual, or a group of individuals, and zero otherwise. *Leverage* is equal to the value of long term debt divided by the book value of total assets. *Firm Size* is defined as the book value of total assets in Million SEK. *Firm Age* is defined as the number of years since the firm was founded. *Investment* is defined as total capital expenditure divided by the book value of total assets. *Profitability* is equal to Earnings Before Interest, Taxes, and Depreciation (EBITD) divided by the book value of total assets. *Liquidity* is equal to the value of short term assets divided by the book value of total assets. *Tobin's q* is defined as the sum of market value of equity and book value of debt divided by the book value of total assets. *Outside Block* is equal to one if the second largest shareholder holds at least 10 percent of the voting rights, and zero otherwise. The duration dependency of hazard rate is captured by four dummy variables corresponding to four-year duration intervals. Ln denotes the natural logarithm.