"The disappearing 'Deutschland AG' – an analysis of blockholdings in German large caps"

| AUTHORS | Kerstin Fehre
Marc Steffen Rapp
Bernhard Schwetzler
Marco O. Sperling |

NUMBER OF REFERENCES

0

NUMBER OF FIGURES

0

NUMBER OF TABLES

0

Kerstin Fehre (Germany), Marc Steffen Rapp (Germany), Bernhard Schwetzler (Germany), Marco O. Sperling (Germany)

The disappearing 'Deutschland AG' – an analysis of blockholdings in German large caps

Abstract

The German corporate governance system changed substantially over the last ten years. Meanwhile, ownership structures of German firms changed significantly. The paper examines the phenomenon of changing ownership structures by studying blockholdings of German large caps between 1997 and 2006. It examines the dynamics of blockholdings by analyzing the evolution of free float and block trades, where at least 5% of voting rights change hands. Two findings emerge. First, the authors find that free float increases from 65% in 1997 to 75% in 2006, mainly caused by German financials and German government entities. Simultaneously, they observe a surprisingly high number of block trades: on average 1.6 block trades per firm from 1997 to 2006. Second, the authors find that particularly individuals and German industrials are guarantors for a stable ownership structure. German financials or German government entities as blockowners increase the free float and the likelihood of block trades. Moreover, block trades are more likely to occur in firms having foreign investors as owners. The findings are of interest with respect to the evolution of the so-called 'Deutschland AG' but also with respect to the current anchor shareholder discussion.

Keywords: free float, block trades, ownership, Germany.
JEL Classification: G30, G32, G34.

Introduction

From a theoretical perspective the concentration of a firm's ownership structure is supposed to be determined by the trade-off resulting from benefits and costs of blockholders[1]. While large shareholders may serve as monitors disciplining management (e.g., Shleifer, Vishny, 1986; La Porta et al., 1998), they may enjoy private benefits of control (e.g., Grossman, Hart, 1988). Franks and Mayer (2001) report on an active market for blocks of shares in Germany meaning that control blocks are traded rather frequently[2]. This leads to the question what determines the dynamics of ownership structures. For instance, under which circumstances a change in the level of a firm's free float will be empirically observable? Or more specifically, given a certain ownership structure, under which conditions will the ownership structure remain stable and under which is it supposed to change?

Interested in these questions, one has to keep in mind that a change in firm's ownership structure may come in three shapes. First, a blockholder may sell a substantial stake of the firm to dispersed shareholders. Such a *block sale* is accompanied by an increase in the firm's free float. Second, two existing blockholders may trade a stake in the firm or an existing blockholder may sell a stake to a new emerging blockholder. Such a *block trade* does not affect the free float. Third, a new investor may enter the scene and acquire a substantial stake of the firm from small shareholders. Such a *block acquisition* results in a decreasing free float.

In this paper we examine the dynamics of blockholdings (and its complement free float) in German large caps. Based on a hand-collected data set of ownership data from 1997 to 2006 we address the following three questions: (1) How did blockholdings evolve over time? (2) What determines the change in a firm's free float? (3) What determines the probability of a block trade? Therefore, we collect ownership data for DAX30 firms and examine the evolution of free float and block trades, where at least 5% of voting rights change hands. After presenting descriptive data, we run regression analyses (OLS and probit models) to examine the behavior of blockholdings. Thereby, we use two classes of explanatory variables: ownership structures and firm characteristics a year prior to the (possible) change in ownership structure.

Two findings emerge. First, we find that free float of German large caps increases from 65% in 1997 to 75% in 2006. This is mainly caused by German financials and the German government, where former shareholders reduced their average stake from 4.69% in 1997 to 0.62% in 2006. Moreover, we observe a surprisingly high number of block trades: on average our data show 1.6 block trades per firm from 1997 to 2006. In other words, the (unconditional) probability for a blocktrade in a German large cap over the next year is about 17%. Second, having German financials or German government entities as blockowners increases for one thing the

[1] A blockholder is generally defined as an individual or an entity holding at least 5% of voting rights of a publicly traded company (e.g., Mehran, 1995). This threshold is in line with current SEC and (former) German regulations (Gesetz über den Wertpapierhandel, WpHG).

[2] Trading of large blocks of shares is an important event. It may result in a significant change in ownership structure which may be followed by changes in board composition, governance, or even an attempt to takeover.

likelihood of block trades and for another thing the free float. Thus, we find that only individuals and German industrials are guarantors for a stable ownership structure. This finding is of interest with respect to the evolution of the so-called 'Deutschland AG' but also with respect to the current anchor shareholder discussion[1].

We challenge our findings in two ways. First, we add various measures of firm characteristics as explanatory variables to our regression models. According to theory, firm characteristics play an important role (see e.g., Helwege et al., 2007). For instance, acquiring blocks of bigger firms should be more difficult. Further, for firms who are heavily committed to research and development (R&D) informational asymmetries between incumbents and outsiders should be more severe. Similarly, shortly after a firm's initial public offering (IPO) it might not be possible to sell a block of shares without discounts. Finally, poor past performance might make it more likely that someone tries to acquire a firm. Second, we redo the analysis on a different set of ownership data. Ownership structures are often characterised by substantial cross-holdings and the use of indirect means of control. Thus, while most of our analysis relies on direct ownership data, we also challenge all our findings by an analysis based on ultimate ownership data following Faccio and Lang (2002).

The remainder of the paper is organized as follows. In section 1 we briefly discuss literature on ownership structures. In section 2 we present our research design, data set, and descriptive statistics. The regression analysis examining the dynamics of block-holdings in German large caps is presented in section 3. We conclude in the final section.

1. Ownership structures, blockholders, and block trades

Berle and Means (1932) mark the beginning of discussion of principal agent problems in large firms. It can be seen as the beginning of a scientific discussion about corporate ownership structures. The authors predict that modern corporations in economies with well-developed capital markets will not be run by its owners but by specialized managers. They report to dispersed (or atomistic) shareholders only providing their capital but not participating in day-to-day business. Hence, Berle and Means (1932) predict that the modern corporation will be widely held.

This hypothesis remains untested for a long time. Shleifer and Vishny (1986) as well as Holderness and Sheehan (1988) are among the first providing evidence on ownership structures for the U.S. Shleifer and Vishny (1986) find more than three quarter of their sample firms having at least one shareholder owning more than 5% of voting rights. Similarly, Holderness and Sheehan (1988) do not confirm the existence of the widely held firm in general: about 13% of their sample firms trading at the NYSE or AMEX do have a majority shareholder owning at least 50.1% (but less than 95%). Concentration of ownership is generally even higher in countries with less developed capital markets. Evidence for this is found in La Porta et al. (1999), who examine ownership structures in 27 countries worldwide. Similar results are found in Faccio and Lang (2002) and Thomsen et al. (2006), both examining the European landscape. Berglöf and Perotti (1994) investigate corporate governance structures in Japan and figure out that it seems to be normal that within the "keiretsu" large equity stakes are held among members.

Germany yields some special characteristics. The market for equity is rather small compared to its equivalents in the U.S. or the UK, prototypes of capital market-based economies. There is considerable concentration of ownership even for the largest firms in Germany whereas corporate ownership in Anglo-Saxon countries tends to be more dispersed (e.g., La Porta et al., 1999). One reason might be that corporate governance, particularly shareholder protection, is perceived to be weaker. Several studies examine ownership structures of German firms[2]. Gorton and Schmid (2000) find that merely 35% of all German firms are widely held. Using an ultimate owner specification, Faccio and Lang (2002) find that only approx. 10% of German firms are widely held. Qualitatively similar results are found in Heiss and Köke (2004). Franks et al. (2006) investigate the historical development of ownership structures in Germany. A common finding of all studies is the fact that ownership structures of German firms seem to be dominated by large blockholdings.

Consequently, the effect of blockholders becomes an important issue examined in several studies[3]. Shleifer and Vishny (1986) point out that the existence of a blockholder helps to overcome the free riding prob-

---

[1] An anchor shareholder is a shareholder who has a long-term interest in the firm. Anchor shareholders are perceived as guarantors of stable ownership structures.

[2] Studies examining ownership structures of German firms are among others Adams (1999), Gorton and Schmid (2000), Franks and Mayer (2001), Faccio and Lang (2002), Heiss and Köke (2004), Franks et al. (2006), Kaserer and Moldenhauer (2008), Andres (2008).
[3] While we will only review the important arguments, Holderness (2003) provides a survey of the blockholder literature.

lem of monitoring. While costs of monitoring management are fixed, benefits of monitoring are a function of ownership in cash flow rights of the firm. Thus, for small shareholders monitoring costs are prohibitively high, since they would only reap a small fraction of the corresponding benefits. Therefore, it is usually assumed that small shareholders will not monitor the management[1].

However, blockholders have the critical mass of voting and cash flow rights so the costs of monitoring are outweighed by the benefits[2]. Small shareholders obviously benefit from the monitoring activity of blockholders. In the literature these benefits are inter alia called *shared benefits from blockholding*. However, there are also benefits that blockholders do not share with other shareholders. The phenomenon that (controlling) blockholders use their power to transfer resources out of the firm into their own pockets is often called *tunneling* (see, e.g., Grossman, Hart, 1988). At best, these *non-shared benefits* may be interpreted as an extra compensation for their monitoring effort. In an empirical study Thomsen et al. (2006) document a negative association between blockholders and firm performance in Europe. According to the authors one reason may be that due to weak corporate governance blockholders are able to tunnel resources efficiently out of the firm.

The evidence is inconclusive for Germany. Nenova (2003) finds that for German firms voting rights have a considerable value (approx. 9.5% of firm value) and concludes that there seems to be significant private benefits for corporate control. In contrast, Kaserer and Moldenhauer (2008) find a generally positive effect of blockholders for corporate performance. The study of Andres (2008) indicates that this effect is mainly driven by founding families.

Given that there are benefits and costs of blockholdings, our next issue of interest is the question under which circumstances we will observe a reallocation of large blocks of a firm's voting rights. Interestingly, this question did not receive much attention so far. Some studies cover the effect of asymmetric information and monitoring behavior. Díaz Díaz and García Olalla (2004) investigate block trades in Spain. They find a higher probability of trading by insiders and conclude that insiders benefit from a

superior set of information. Other studies examine the premium to be paid for block trades. Mikkelson and Regassa (1991) find an average premium of 10% for cash offers. However, there seems to be no study examining the issue in the German context, which provides a particularly interesting setting.

2. Research design, sample construction, and descriptive statistics

In this section we present our research design, data set, and descriptive statistics.

2.1. Research approach and sample. We aim at analyzing the dynamics of blockholdings of German large caps. Thus, we look at ownership data for German firms listed in the DAX30. Blockholders are identified and free float is defined as the residual. For each firm, we compare its ownership structure in time *t* with its ownership structure one year before (*t*-1).

There are three scenarios of interest illustrated in Figure 1. In the *stable ownership structure* scenario (Scenario 1), all blockholders keep their stakes and no new blockholder emerges. The firm's free float changes in Scenario 2a and 2b. A blockholder reduces his position or a new blockholder enters the scene. In the *block trade* scenario we distinguish two sub-scenarios (Scenario 3a and 3b). In the *block trade between incumbents* scenario one blockholder reduces its holdings by at least 5%, while a second already existing blockholder increases its holding by the same amount. In the *entering block trade* scenario, an existing blockholder reduces its holdings by at least 5%, while a new blockholder enters the scene.

We use direct ownership of voting rights in our sample. However, German ownership structures are often characterized by substantial cross-holdings. Therefore, we also collect ultimate ownership data using the algorithm of Faccio and Lang (2002) with a 10% threshold and challenge the findings obtained from direct ownership. The results of this robustness test are in line with the findings reported here.

Our initial sample consists of all firms listed in the DAX30 between January 1, 1997 and December 31, 2006[3]. We remove financial firms (SIC 6000-6999) from the sample since most of the commonly used control variables do not work well with these industries. This leaves a sample of 254 firm years[4].

---

[1] This affect is called *rational apathy.*
[2] A special group of blockholders are (founding) families. In general, families seem to be good monitors, since family controlled firms exhibit superior performance (e.g., Anderson, Reeb, 2003; Andres, 2008). Nevertheless, the dark side of this family ownership is that under certain circumstances there may be conflicts between them and minority shareholders (see Maury, 2006).

[3] Since the composition of the DAX30 changes over time, we dynamically adjust the index and the composition at the end of each year. We obtain the information about index composition from Deutsche Börse AG.
[4] In our regression analysis we control for various effects. Missing data in control variables further reduces our sample by 23 firms.
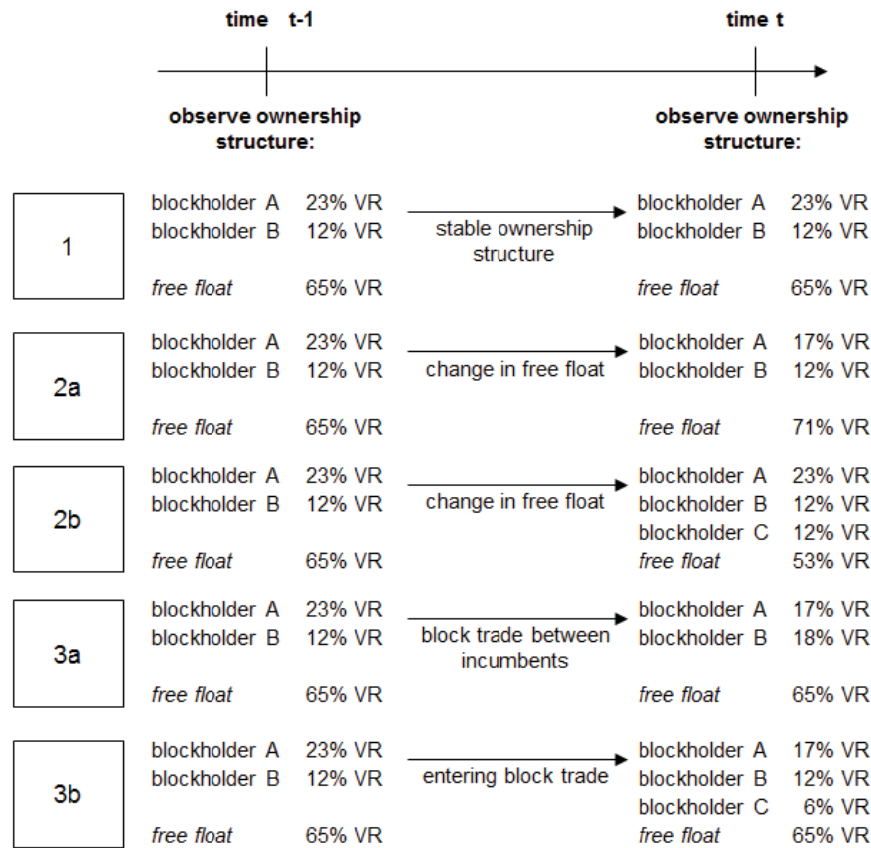
Fig. 1. Research design

2.2. Ownership data. For collecting ownership data, we use two different data sources[1]. First, we extract information about ownership of each firm year from the November editions of Commerzbank's 'Wer gehört zu wem? – Beteiligungsverhältnisse in Deutschland' CD-ROMs. In case that certain information is not provided, we search for the information in the CD-ROM editions of Hoppenstedt's 'Aktienführer'[2].

We define a firm's free float as the residual holdings of voting rights after taking blockholders into account:

$$FF_t = 100 - \sum_{i=0}^{n} VR_{i,t},$$ (1)

where FF_t is the percentage of voting rights in free float and $VR_{i,t}$ are voting rights in the hands of blockholder i at time t[3].

Since we want to investigate what determines the changes in free float, we look at relative changes in free float (FF_t^{rel}) for each firm year defined in equation (2).

$$FF_t^{rel} = \frac{FF_t - FF_{t-1}}{F_{t-1}}.$$ (2)

Relative changes in free float have the advantage of better reflecting the changes of voting power of one share in the hands of the blockholders than absolute changes in free float.

For robustness test we look at absolute changes in free float FF_t^{abs} defined in equation (3).

$$FF_t^{abs} = FF_t - FF_{t-1}.$$ (3)

Our general results are confirmed when using this definition[4].

We define *blockholdings* as packages of voting rights in a particular firm owned by a single individual or entity and exceeding a certain threshold of all voting rights issued by the firm. In line with legislation effective during the observed period, we use 5% of voting rights as threshold[5].

---

[1] Collecting ownership data for German firms is always time-consuming, since it involves several steps to be accomplished by hand.
[2] When Hoppenstedt's CD-ROMs are unavailable, we take the information from hard copy editions of Hoppenstedt's 'Aktienführer'.
[3] Note that there might be discrepancies to the free float figure provided by Deutsche Börse AG for some firm years, as Deutsche Börse AG, Commerzbank, and Hoppenstedt measure free float at different times.

[4] See Appendix A.
[5] German disclosure law (Gesetz über den Wertpapierhandel, (WpHG)) – as well as SEC – requires disclosing ownership of voting rights if exceeding 5%. Note, since January 2007, German legislation is even stricter requiring disclosure of shareholding when exceeding 3% of voting rights (see Section 21(1) WpHG). Since the average participation at the shareholder assembly is between 40%-60% of all voting rights blockholders owning only 5% might have a decisive impact in polls.

After collecting ownership data, we compare ownership structure for each firm in year t and $t+1$ to identify block trades as described above. To challenge our findings, we use two different definitions of block trades, resulting in two overlapping samples. The first definition comprises all block trades while in the second all block trades between incumbents and outsiders. The results for our sample on entering block trades generally confirm our findings[1].

We categorize blockholders into six groups. The first group, called individuals (INDIV), comprises (groups of) individuals and non-corporate, unlimited liability companies directly controlled by individuals. In contrast to the U.S. there are numerous non-corporate companies ('Personengesellschaften') holding shares[2]. This tends to make research on German ownership structures more difficult. We use liability of owners to proxy for the owner group: the German legal forms GbR (non-trading partnership), OHG (trading partnership), and KG (limited partnership) are directly linked to individuals since their owners are fully liable. We, therefore, assume that there is a strong link between the 'company' and the fully liable individual-owner and count them as individuals[3].

The second group are German non-financial or industrial firms (GERIND)[4].

German financial firms (GERFIN) are the third group of owners. It comprises banks, insurances, financial service firms and mutual funds[5].

German government sector entities and the state of Germany are the fourth group (GERGOV). Governments are prone not to maximize the value of assets under their control since entities owned by the government are more likely to be subject to politically rather than economically-driven decision making[6].

Foreign investors are the fifth group of blockholders (FORGN) made up of all non-German investors. The last group is called undisclosed (UNDIS) comprising all investors not fitting into another group. This is especially important for investors whose identity cannot be determined because disclosure rules of owners using legal forms KGaA (limited partnership by shares), GmbH (limited liability company), and GmbH & Co. KG are not as strict as for listed entities[7].

---

[1] See Appendix B. Figure 1 illustrates the way we construct the sample with regard to free float and block trades.
[2] A special treatment in terms of taxation might be the reason.
[3] Most blockholders in this category are founding families still controlling a significant share of equity.
[4] While suspected otherwise for a long time, cross-holdings and pyramids among German industrials are rather low. Mostly equity holdings are rooted in business relationship or come from spin-off decisions.
[5] Until the mid-1990s, there have been considerable cross-holdings among these firms as we will show later on.
[6] We consider banks that are owned by the government such as WestLB or KfW as government sector entities.
[7] When determining ultimate ownership, we stop if we find such a firm in a control chain for these reasons.

2.3. Control variables. Several firm characteristics may have an impact on free float as well as on the probability of block trades. The data for constructing control variables is obtained from Datastream and Worldscope[8].

1. *Firm size.* We proxy size by the natural logarithm of net sales or revenues (WC01001). In a robustness test, we run the analysis with the natural logarithm of total assets (WC02999). The results remain the same under the alternative size specification[9].

2. *Research & development.* A firm with high R&D expenditures might exhibit higher information asymmetries between blockholders and outside shareholders. Outsiders may not be able to evaluate the prospects of research projects correctly. Besides controlling for R&D expenses which we proxy by the data items R&D expenses (WC01201) over net sales or revenues (WC01001), we include a R&D dummy which is one if the firm has R&D expenses and zero otherwise. Following the approach of Helwege et al. (2007), we check whether firms conducting R&D are fundamentally different from non-R&D firms. We expect block trades to be less likely when firms are committed to R&D. Finally, we check our results for robustness by using R&D expenses over total assets instead of net sales or revenues.

3. *Initial public offerings.* We take into account that there is a strong decrease in (inside) ownership during ten years after an IPO (see, e.g., Helwege et al., 2007). However, it is not clear whether a strong decline in inside ownership is caused by block trades or frequent sales of small packages of shares. Since it is not unusual that firms enter DAX30 one or two years after an IPO, it is necessary to control for this influence. We put the IPO dummy equal one if the firm's IPO is less than ten years ago and zero otherwise. Nevertheless, we expect the sign of IPO to be positive.

4. *Performance.* Poor past performance is one of the most important reasons why firms are taken over by a raider, possessing superior management skills (see, e.g., Grossman, Hart, 1980). Therefore, the probability of being taken over should be higher in case of poor past performance. However, Franks and Mayer (2001) conclude that gains from change of control are rather limited in Germany. Therefore, we consider the impact of past performance as being rather ambiguous. We took the annual total return (annual changes in total return index/Datastream item RI) of the previous year to proxy for past performance.

---

[8] We give the corresponding data items in parenthesis.
[9] Regression tables are available upon request.

2.4. Descriptive statistics. In Table 1, we provide summary statistics for our data set on ownership (Panel A) and for the control variables used in the regression models (Panel B). The owner group individuals is the most important group of blockholders in German firms (in terms of voting rights) with an average stake of 9.48%. It is followed by the German government entities holding on average over all firm years about 6.11%. The reason for the comparable high stakes is formerly state owned firms in which some equity is still owned by the government. The average stakes of German financials, German non-financials, and foreign investors are roughly the same. However, it should be noted that maximum stake as well as the standard deviation is much lower for German financials than for the other two groups.

Concerning control variables, the average net sales or revenues is about EUR 19.97 bn. In 85% of firm years, R&D expenditures are positive and 16% of all firm years exhibit a positive IPO dummy. Formerly state-owned companies and spin offs/joint ventures of large German non-financials entered the DAX30 shortly after their IPO[1].

Table 1. Summary statistics

Panel A: Summary statistics of aggregate ownership structure (from Commerzbank's 'Wer gehört zum wem? – Beteiligungsverhältnisse in Deutschland')						
	INDIV	GERJND	GERFIN	GERGOV	FORGN	UNDIS
Mean	9.48	3.41	3.51	6.11	3.43	4.69
Median	0.00	0.00	0.00	0.00	0.00	0.00
Maximum	90.00	71.87	31.30	74.00	64.00	45.73
Minimum	0.00	0.00	0.00	0.00	0.00	0.00
Std dev	20.75	12.61	6.75	15.84	9.64	8.96
Max VIF	1.34	1.47	1.15	1.24	1.47	1.27
Observations	221	221	221	221	221	221
Panel B: Summary statistics of firm characteristics (from Worldscope)						
	SIZE	RD/SALES	RDEX		IPO	PERF
Mean	16.81	4.19	0.85		0.16	14.15
Median	16.98	2.31	1.00		0.00	8.40
Maximum	18.90	20.97	1.00		1.00	162.71
Minimum	13.35	0.00	0.00		0.00	-70.21
Std dev	1.08	5.25	0.36		0.36	39.63
Max VIF	1.65	1.58	1.42		1.75	1.06
Observations	218	205	205		205	198

The development of ownership concentration is shown in Table 2. The aggregate stake of individuals fluctuates only slightly over time, while the stake of German industrials peaks in 2000 and 2001. During these years, there have been the IPOs of two Siemens spin-offs/joint ventures. The aggregate stake held by German financials decreases sharply from 4.69% in 1997 to 0.62% in 2006. We read this as sign for a diminishing role of German financials as major shareholders. We encounter cross-holdings mainly clustered around German financial firms like Münchener Rückversicherungs AG, Allianz AG as well as Bayerische Vereinsbank AG, especially in the early years of our study (see Figure 2). The firms involved in this net are heavily interlinked on direct ownership level. When looking at ultimate owners, most of them are widely held. However, direct ownership interconnections disappear within five year (Figure 3)[2]. Nonetheless, we can say little about the influence of German financials since representation on boards did not decrease in a similar magnitude (see Dittmann et al., 2010). The stake of German government also decreases strongly over time since a large fraction of equity in formerly state owned companies has been sold. The average stake of the blockholder group undisclosed remains fairly constant over time[3].

Generally, the average stake held by blockholders decreases strongly over the ten years of our sample. On average, blockholders own 35.96% of voting rights in 1997 and 24.83% in 2006. Arguing that block holdings may serve as a substitute for good corporate governance (e.g. Shleifer, Vishny, 1986), this might be seen as an indicator that the market rewards the efforts of German regulators to improve the German corporate governance environment.

---

[1] The most prominent examples are the IPOs of Deutsche Telekom AG in 1996 and Deutsche Post AG in 1996 in case of formerly state owned companies, Infineon AG which went public in 2000 after being spun off from Siemens AG, and EPCOS AG which began as a joint venture between Siemens AG and the Japanese Matsushita Electronic Industrial Co., Ltd. in 1999 and went public soon after.

[2] Allianz AG took over Dresdner Bank AG in 2001. Due to this fact, they own 77.33% of voting rights. One of the main reasons might be the 2001 change in corporate tax regime which allowed firms to sell off equity without being taxed for accumulated capital gains.

[3] We are conservative in grouping owners. Therefore, limited liability investment companies owned by other firms might end up in the group undisclosed (see section 2.2) so the average stake of all other groups might be too low.

For our sample period we identify 40 block trades[1]. Table 3 lists the distribution of block trades over the years. Although there is no significant clustering of block trade activity over time, we identify three peaks: the first peak are six block trades in 2000 which we attribute to increased merger activity at the height of the so-called 'internet bubble'. The 2002 peak (seven block trades) might be caused by the 2001/2 change of tax code which virtually tax exempts capital gains on corporate level. The last peak in 2006 (six block trades) might also be caused by increased M&A activity due to industry consolidation.

Table 2. Development of ownership structure

Year	INDIV	GERIND	GERFIN	GERGOV	FORGN	UNDIS	SUM
1997	10.93	1.94	4.69	8.37	4.30	5.46	35.96
1998	10.74	1 84	4.45	6.03	426	4.76	32.08
1999	10.02	4.51	5.27	6.15	3.03	4.52	33.50
2000	10.31	7.04	4.04	4.52	3.53	4.20	33.64
2001	9.33	7.62	2.44	6.50	1.65	4.91	32.45
2002	9.44	2.88	4.33	6.03	2.42	5.38	30.48
2003	8.18	2.41	2.62	639	3.12	5.42	28.14
2004	8.46	1.95	2.48	6.16	3.56	4.52	27.13
2005	844	3.35	0.59	4.14	556	3.97	26.05
2006	8 78	3.08	0.62	3.59	5.15	3.61	24.83
Average	9.46	3.66	3.15	5.79	3.66	4.67	30.39

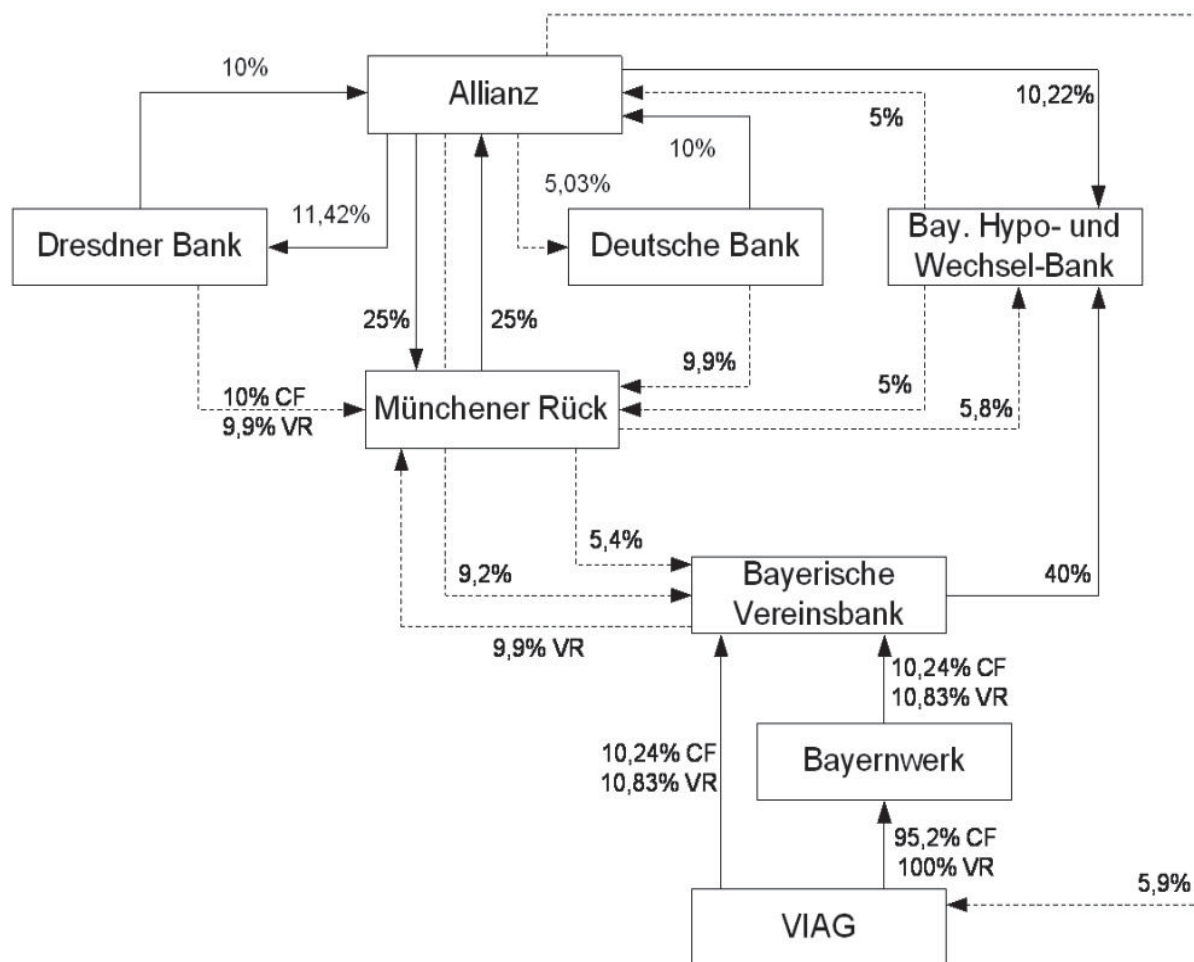**Fig. 2. Cross-holdings among major German banks and insurances in 1997[2]**

---

[1] For our analysis of entering block trades (EBT) we find 35 trades. The results on EBT are exhibited in Appendix B.
[2] Significant cash flow (CF) and voting rights (VR) are shown as lines between firms. There is no deviation from 'one share-one vote principle', if cash flow and voting rights are not stated separately.
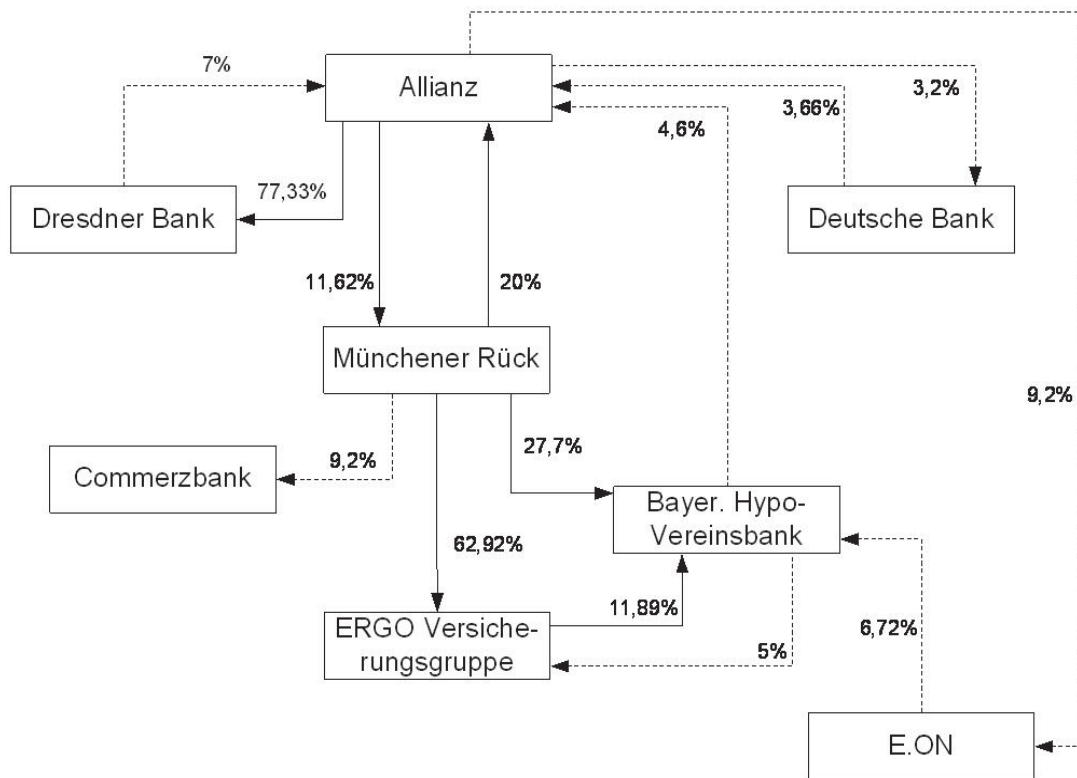
Fig. 3. Cross-holdings among major German banks and insurances in 2002[1]

Table 3. Sample distribution by number of block trades

Year	Firms		Firm years
	Absolute	Relative	
1998	2	8.00	25
1999	3	12.00	25
2000	6	24.00	25
2001	4	15.38	26
2002	7	26.92	26
2003	4	15.38	26
2004	3	11.54	26
2005	5	19.23	26
2006	6	24.00	25
Total	40	17.39	130

3. Analysis on free float and block trades

For regressing changes in free float on ownership data and firm characteristics we use OLS regression models. We control for heteroskedasticity by using robust standard errors. We use probit models for regressing block trade activity on ownership structure and control variables[2]. In this case we correct standard errors using Huber/White adjustments (see White, 1980).

We use five specifications for our regressions. In the first specification we include the six different owner group variables and the constant term. In the following specifications we add control variables. Table 1 provides maximum variance inflation factors (VIFs) for all our control variables over all subsequently examined regression specifications. All VIFs are far below 2 indicating that we are not faced with the problem of multicollinearity.

First, we present the results of relative changes in free float and then our results for block trades. Third, we critically examine our results and discuss short-comings of our study.

3.1. Results for relative changes in free float. In the regression of relative changes in free float, we find that German financials and the German government as owners do have a positive impact on relative changes in free float. These effects are highly statistically significant in most cases (see Table 4). The coefficients are roughly the same throughout all model specifications (0.004 in most cases) while foreign investors exhibit statistically significant influence only in specification (1) and (2) German industrials are weakly statistically significant in three cases.

Our results have ample implications with respect to the stability of ownership structure. Having German industrials, and to a certain extent, also individuals as owners seems to lead to a stable ownership structure (with respect to blockholders) while German financials or the German government lead to a rather unstable structure. Unfortu-

[1] Significant cash flow (CF) and voting rights (VR) are shown as lines between firms. There is no deviation from 'ones hare-one vote principle', if cash flow and voting rights are not stated separately.
[2] See Hoetker (2007) for a discussion of the use of probit models in management research.

nately, we cannot make any predictions about foreign investors since the statistical significance of their impact is unsettled.

Our control variables do not have statistical significant impact on free float. This is rather surprising but might be a hint that changes of free float can be best explained by looking at ownership structure. Concerning the model quality we can state that except for the R&D dummy we have no sign changes in the specification (with exception of the constant). Further, the adjusted R^2 is rather stable among all model specifications. It has its lowest value in specification (4) and the highest value in (1). The number of observations decreases when introducing more control variables which is caused by a lack of data availability in Thomson Datastream/Worldscope.

3.2. Regression results on block trades. In the regression of all block trades, we find that having German financial firms and foreign investors as owners has a positive impact on the probability of a block trade, in fact, it is highly statistically significant (see Table 5). This strong influence can be found in all five model specifications (an exception is the influence of foreign investors in specification (3) which only exhibits weak statistical significance). In case of German financials, this impact might be caused by effects of 2001 corporate tax reform. In its aftermath, many German financials sold significant parts of their equity in German

firms. There is a statistically significant positive impact on the probability of a block trade when German government owns stakes. This effect stays stable for all model specifications. The reason for this influence may be that there are formerly state owned companies in the DAX30. During the 1990s the German government was only able to sell equity of state owned firms in certain tranches due to liquidity restrictions at the German stock market.

Surprisingly, size does not have a statistically significant influence in model specifications (2)-(4) and only becomes statistically significant when controlling for past performance in specification (5). However, firms committed to R&D seem to be fundamentally different since the R&D dummy does have a highly significant negative impact.

This might be caused by additional information asymmetries between blockholders and outside shareholders who might not be able to estimate the correct value of research projects without having access to insider information. R&D/sales does not have any statistical significance on block trades. Past performance, controlled for in specification (5), does not have any statistically significant influence. However, when controlling for past performance the IPO dummy becomes statistically significant and negative. It might be that shortly after an IPO it is harder to sell large fractions of shares due to reasons of liquidity and informational asymmetries[1].

Table 4. Relative changes in free float

We use an OLS regression to estimate the relative changes in free float (see equation (2)) between t and $t + 1$, given ownership structures and firm characteristics in t. For each model specification we present regression coefficients (corresponding heteroskedasticity consistent standard errors in parenthesis). *, **, *** denote statistical significance at the 10%, 5%, 1% levels, respectively.

Variables	(1)		(2)		(3)		(4)		(5)	
Intercept	-0.061**	(0.028)	0.092	(0.240)	0.050	(0.242)	0.004	(0.266)	-0.008	(0.271)
Individuals	0.005	(0.002)	0.005	(0.003)	0.005	(0.003)	0.005	(0.003)	0.005	(0.003)
German industrials	0.002*	(0.001)	0.003*	(0.001)	0.003*	(0.001)	0.003	(0.001)	0.001	(0.000)
German financials	0.004**	(0.001)	0.004**	(0.001)	0.004***	(0.001)	0.004***	(0.001)	0.005***	(0.001)
German government	0.004***	(0.001)	0.004***	(0.001)	0.004***	(0.001)	0.004***	(0.001)	0.004***	(0.001)
Foreign investors	0.003**	(0.001)	0.003***	(0.000)	0.002*	(0.001)	0.002	(0.001)	0.001	(0.001)
Undisclosed	0.002	(0.001)	0.002*	(0.001)	0.002	(0.001)	0.002	(0.001)	0.002	(0.001)
Firm size			-0.009	(0.013)	-0.005	(0.012)	-0.003	(0.013)	-0.003	(0.013)
R&D/sales					0.000	(0.003)	0.000	(0.003)	-0.002	(0.004)
RDEX dummy					-0.024	(0.049)	-0.024	(0.050)	-0.010	(0.051)
IPO dummy							0.031	(0.035)	0.045	(0.037)
Performance									0.000	(0.000)
Observations	222		219		206		206		198	
Adj. R^2	0.098		0.097		0.089		0.085		0.097	

---

[1] Again, the number of observations decreases slightly when introducing more control variables due to poor data quality.

Table 5. Regression of all block trades on ownership data

We use a probit regression to estimate the probability of a block trade between t and $t + 1$, given ownership structures and firm characteristics in t. For each model specification we present regression coefficients (corresponding Huber/White adjusted standard errors in parenthesis). *, **, *** denote statistical significance at the 10%, 5%, 1% levels, respectively.

Variables	(1)		(2)		(3)		(4)		(5)	
Intercept	-1.488***	(0.199)	1.217	(1.866)	1.708	(2.303)	2.619	(2.427)	3.455	(2.488)
Individuals	0.004	(0.005)	0.002	(0.005)	0.000	(0.006)	0.000	(0.006)	0.001	(0.006)
German industrials	0.018**	(0.007)	0.009	(0.008)	0.012	(0.008)	0.028*	(0.014)	0.013	(0.015)
German financials	0.039***	(0.014)	0.010***	(0.015)	0.053***	(0.016)	0.054***	(0.016)	0.052***	(0.016)
German government	0.014**	(0.006)	0.016**	(0.006)	0.023***	(0.007)	0.025***	(0.008)	0.021**	(0.009)
Foreign investors	0.028***	(0.010)	0.030***	(0.010)	0.023*	(0.011)	0.01***	(0.015)	0.048***	(0.016)
Undisclosed	0.020*	(0.010)	0.022**	(0.010)	0.017	(0.011)	0.028**	(0.013)	0.023*	(0.012)
Firm size			-0.163	(0.111)	0.161	(0.136)	-0.215	(0.143)	-0.258*	(0.147)
R&D/sales					0.016	(0.021)	0.02	(0.023)	0.007	(0.026)
RDEX dummy					0.800**	(0.350)	0.882**	(0.349)	-0.770**	(0.351)
IPO dummy							-1.039	(0.649)	-1.074*	(0.651)
Performance									0.004	(0.002)
Observations		221		218		205		205		197
McFadden R^2		0.076		0.086		0.142		0.167		0.184

3.3. Critical examination. Even though the results explain some circumstances surrounding block trades, there are at least some issues to be considered: one problem is poor coverage of ownership data in Germany. Although we used data from two prominent sources, there are still some gaps in our sample, especially for the early years of the sample. Even for Germany's largest firms disclosure requirements were not very strict during these years. One possibility to at least partly overcome this problem would be collecting ownership data for a larger scope of firms. However, problems regarding disclosure of ownership data are even more serious for smaller firms.

Further, one should be cautious when transferring our results to firms not listed in the DAX30. Liquidity in these market segments tends to be rather low. Generally, the number of German firms trading at stock exchange is small compared to the U.S. or UK. We would expect results to be different for these economies.

The third issue is that we cannot control for interaction between blockholders or coalitions of them. We would like to do this since theory suggests its relevance. However, the sample is too small to conduct such an analysis.

Conclusion

We aim at analyzing the dynamics of blockholdings of German large caps. Change in a firm's ownership structure may come in three shapes. First, a blockholder may sell a substantial stake in the firm to dispersed shareholders, which increases the firm's free float. Second, a block trade may happen. This does not affect the free float of a firm. Third, a new investor emerges and acquires a substantial stake of the firm from small shareholder resulting in a decreasing free float for the firm. To examine the issue we collect ownership data for DAX30 firms from various sources. After presenting some descriptive statistics, we use regression analysis (OLS and probit models) to examine the behavior of blockholdings.

Two findings emerge. First, we find a substantially increasing free float of German large caps from 1997 to 2006; a fact mainly driven by German financials and the German government. Moreover, we document that the (unconditional) probability for a block trade in a German large cap over the next year is some 17%. Second, we find that having German financials or German government entities as blockowners increases the likelihood of block trades and an increasing free float. Moreover, block trades are more likely to occur in firms having foreign investors as owners. Thus, we find that only individuals and German industrials are guarantors for a stable ownership structure. This finding is of interest with respect to the evolution of the so-called 'Deutschland AG' but also with respect to the current anchor shareholder discussion.

We challenge our findings in two ways. First, we add various measures of firm characteristics as explanatory variables to our regression models. Second, we redo the analysis on a different set of ownership data. These analyses reinforce our findings. An interesting next step for this line of research would be to analyze the interaction among blockholders and the agendas of different owner groups with respect to their persistence in a particular firm. Moreover, the question who is actually leaving seems to provide a fruitful field for further research.

References

1. Adams, Michael (1999). 'Cross holdings in Germany', *Journal of Institutional and Theoretical Economics*, 155 (1), pp. 80-109.
2. Anderson, Ronald C. and David M. Reeb (2003). 'Founding-family ownership and firm performance: evidence from the S&P 500', *Journal of Finance*, 58 (5), pp. 1301-1328.
3. Andres, Christian (2008). 'Large shareholders and firm performance − an empirical examination of founding-family ownership', *Journal of Corporate Finance*, 14 (4), pp. 431-445.
4. Berglöf, Erik and Enrico Perotti (1994). 'The governance structure of the Japanese financial keiretsu', *Journal of Financial Economics*, 36 (2), pp. 259-284.
5. Berle, Adolf A. and Gardiner C. Means (1932). *The modern corporation and private property*, McMillian, New York, NY.
6. Díaz Díaz, Belén and Myriam García Olalla (2004). 'Asymmetric information and monitoring behavior in block trades: an empirical analysis for Spain', *Corporate Ownership and Control*, 2 (1), pp. 25-37.
7. Dittmann, Ingolf, Ernst G. Maug and Christo ph Schneider (2010). 'Bankers on the boards of German firms: what they do, what they are worth, and why they are (still) there', *Review of Finance*, 14 (1), pp. 35-71.
8. Faccio, Mara and Larry H.P. Lang (2002). 'The ultimate ownership of Western European corporations', *Journal of Financial Economics*, 65 (3), pp. 365-395.
9. Franks, Julian R. and Colin Mayer (2001). 'Ownership and control of German corporations', *Review of Financial Studies*, 14 (4), pp. 943-977.
10. Franks, Julian R., Colin Mayer and Hannes F. Wagner (2006). 'The origins of the German corporation – Finance, ownership, and control', *Review of Finance*, 10 (4), pp. 537-585.
11. Gorton, Gary and Frank A. Schmid (2000). 'Universal banking and the performance of German firms', *Journal of Financial Economics*, 58 (1-2), pp. 29-80.
12. Grossman, Sanford J. and Oliver D. Hart (1980). 'Takeover bids, the free-rider problem, and the theory of the corporation', *Bell Journal of Economics*, 11 (1), pp. 42-64.
13. Grossman, Sanford J. and Oliver D. Hart (1988). 'One sha re-one vote and the market for corporate control', *Journal of Financial Economics*, 20 (1/2), pp. 175-202.
14. Heiss, Florian and Jens Köke (2004). 'Dynamics in ownership and firm survival: evidence from corporate Germany', *European Financial Management*, 10 (1), pp. 167-195.
15. Helwege, Jean, Christo Pirinsky and René M. Stulz (2007). 'Why do firms become widely held? An analysis of the dynamics of corporate ownership', *Journal of Finance*, 62 (3), pp. 995-1028.
16. Hoetker, Glenn (2007). 'The use of logit and probit models in strategic management research: critical issues', *Strategic Management Journal*, 28 (4), pp. 331-343.
17. Holderness, Cliord G. (2003). 'A survey of blockholders and corporate control', *Economic Policy Review*, 9 (1), pp. 51-63.
18. Holderness, Cliord G. and Dennis P. Sheehan (1988). 'The role of majority shareholders in publicly held corporations', *Journal of Financial Economics*, 20, pp. 317-346.
19. Kaserer, Christoph and Benjamin Moldenhauer (2008). 'Insider ownership and corporate performance: evidence from Germany', *Review of Managerial Science*, 2 (1), pp. 1-35.
20. La Porta, Rafael, Florencio Lopez-De-Silanes and Andrei Shleifer (1999). 'Corporate ownership around the world', *Journal of Finance*, 54 (2), pp. 471-517.
21. La Porta, Rafael, Florencio Lopez-De-Silanes, Andrei Shleifer and Robert W. Vishny (1998). 'Law and finance', *Journal of Political Economy*, 106 (6), pp. 1113-1155.
22. Maury, Benjamin (2006). 'Family ownership and firm performance: empirical evidence from Western European corporations', *Journal of Corporate Finance*, 12 (2), pp. 321-341.
23. Mehran, Hamid (19 95). 'Executive compensatio n structure, ownership, and firm performance', *Journal of Financial Economics*, 38 (2), pp. 163-184.
24. Mikkelson, Wayne H. and Hailu Regassa (1991). 'Premiums paid in block transactions', *Managerial and Decision Economics*, 12 (6), pp. 511-517.
25. Nenova, Tatiana (2003). 'The value of corporate voting rights and control: a cross-country analysis', *Journal of Financial Economics*, 68 (3), pp. 325-351.
26. Shleifer, Andrei and Robert W. Vishny (1986). 'Large shareholders and corporate control', *Journal of Political Economy*, 94 (3), pp. 461-488.
27. Thomsen, Steen, Torben Pedersen and Hans Kurt Kvist (2006). 'Blockholder ownership: effects on firm value in market and control based governance systems', *Journal of Corporate Finance*, 12 (2), pp. 246-269.
28. White, Halbert (1980). 'A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity', *Econometrica*, 48 (4), pp. 817-838.

Appendix A. Absolute free float

Appendix A shows the results of the OLS regressions of absolute changes in free float on ownership structures and firm characteristics. Generally, our findings from the regression of relative changes are confirmed by this robustness test.

Table 6. Absolute changes in free float

We use an OLS regression to estimate the absolute changes in free float (see equation (3)) between t and $t + 1$, given ownership structures and firm characteristics in t. For each model specification we present regression coefficients (corresponding heteroskedasticity consistent standard errors in parenthesis). *, **, *** denote statistical significance at the 10%, 5%, 1% levels, respectively.

Variables	(1)		(2)		(3)		(4)		(5)	
Intercept	-2.184**'	(0.797)	9.194	(9.419)	7.542	(10.58)	6.112	(12.14)	2.602	(11.68)
Individuals	0.102***	(0.034)	0.092***	(0.035)	0.095**	(0.037)	0.097**	(0.038)	0.111***	(0.040)
German industrials	0.075	(0.045)	0.088*	(0.048)	0.097 **	(0.048)	0.083	(0.052)	0.049	(0.041)
Gentian financials	0.212***	(0.075)	0.205**	(0.079)	0.237***	(0.085)	0.241***	(0.085)	0.251***	(0.085)
German government	0.143***	(0.038)	0.149***	(0.039)	0.l46***	(0.047)	0.147***	(0.047)	0.174***	(0.054)
Foreign investors	0.117***	(0.044)	0.118***	(0.043)	0.100**	(0.048)	0.086	(0.057)	0.074	(0.070)
Undisclosed	0.084	(0.063)	0.086	(0.063)	0.085	(0.064)	0.079	(0.064)	0.083	(0.065)
Finn size			-0.669	(0.549)	-0.529	(0.597)	-0.449	(0.686)	-0.257	(0.658)
R&D/sales					0.082	(0.106)	0.087	(0.109)	0.050	(0.106)
RDEX dummy					-1.401	(2.150)	-1.403	(2.169)	-1.371	(2.146)
IPO dummy							0.979	(2.006)	1.452	(2.090)
Performance									0.005	(0.014)
Observations	222		219		206		206		198	
Adj. R^2	0.082		0.091		0.081		0.077		0.083	

Appendix B. Entering block trades

Appendix B shows our results for entering block trades, i.e., block trades between an incumbent and an outsider. The distribution of entering block trades over time is shown in Table 7. The results of our regressions are exhibited in Table 8.

Table 7. Sample distribution by number of entering block trades in each year

Year	Firms		Firm years
	Absolute	Relative	
1998	1	4.00	25
1999	2	8.00	25
2000	5	20.00	25
2001	4	15.38	26
2002	7	26.92	26
2003	4	15.38	26
2004	2	7.69	26
2005	4	15.38	26
2006	6	24.00	25
Total	35	15.22	230

Table 8. Regression of entering block trades on ownership data

We use a probit regression to estimate the probability of a block trade between t and $t + 1$ given firm characteristics in t. For each model specification we present regression coefficients (corresponding standard errors in parenthesis). *, **, *** denote statistical significance at the 10%, 5%, 1% levels, respectively.

Variables	(1)		(2)		(3)		(4)		(5)	
Intercept	-1.378***	(0.193)	1.190	(1.899)	1.603	(2.311)	2.615	(2.428)	3.471	(2.508)
Individuals	0.016**	(0.007)	0.007	(0.008)	0.010	(0.008)	0.027*	(0.014)	0.012	(0.015)
German industrials	0.031**	(0.014)	0.033**	(0.015)	0.044***	(0.016)	0.044***	(0.016)	0.043***	(0.016)
German financials	-0.012	(0.009)	-0.009	(0.009)	-0.013	(0.011)	-0.014	(0.012)	-0.016	(0.013)
German government	0.026**	(0.010)	0.028***	(0.010)	0.022*	(0.011)	0.040***	(0.015)	0.047***	(0.016)
Foreign investors	0.018*	(0.010)	0.020**	(0.010)	0.016	(0.011)	0.027**	(0.013)	0.023*	(0.013)
Undisclosed			-0.155	(0.113)	-0.154	(0.136)	-0.214	(0.143)	-0.260*	(0.148)
Firm size					0.011	(0.021)	0.015	(0.023)	-0.012	(0.026)

Table 8 (cont.). Regression of entering block trades on ownership data

Variables	(1)		(2)		(3)		(4)		(5)	
R&D/sales					-0.654*	(0.350)	-0.736**	(0.347)	-0.617*	(0.347)
RDEX dummy							-1.065*	(0.643)	-1.088*	(0.40)
IPO dummy									-0.003	(0.002)
Performance										
Observations		221		218		205		205		197
McFadden R^2		0.094		0.100		0.149		0.178		0.191