Financial distress, corporate control, and management turnover

Philipp Jostarndt and Zacharias Sautner*

October 2007

Abstract

We empirically investigate the effect of financial distress on corporate ownership and control. Our analysis is based on a panel of 267 German firms that suffered from repeated interest coverage shortfalls between 1996 and 2004. We track each firm's development over the distress cycle with particular attention on corporate ownership, restructuring, and management turnover. We find a significant decrease in ownership concentration. Private investors gradually relinquish their dominating role and thereby cease to be an effective source of managerial control. By contrast, ownership representation by banks and outside investors almost doubles. Shareholdings by executive and non-executive directors also substantially increase but have no effect on managerial tenure. Forced management turnover is mostly initiated by outside investors and banks and often occurs subsequent to debt restructurings, block investments, and takeovers.

Keywords: Corporate control, financial distress, restructuring
JEL Classification: G32, G33

*Philipp Jostarndt is from The Boston Consulting Group, Ludwigstraase 21, 80539 Munich, Germany. Email: jostarndt.philippj@bcg.com. Zacharias Sautner is from the Finance Group, University of Amsterdam, Roetersstraat 11, 1018 WB Amsterdam, The Netherlands, and from the Oxford Financial Research Center of Oxford University. Email: z.sautner@uva.nl. We would like to thank two anonymous referees, Dietmar Harhoff, Christoph Kaserer, Colin Mayer, Bernd Rudolph, Oren Sussman, and Felix Treptow for their detailed and thoughtful comments. Part of this work was written while Philipp Jostarndt was visiting scholar at the Saïd Business School, University of Oxford. This paper also benefited from conference and doctoral seminar presentations at the 2006 Annual Conference on Corporate Strategy (ACCS), Berlin, the 2006 FMA European Conference, Stockholm, the 2006 EFA Zürich Meeting, the University of Munich, the Technical University of Munich, and the University of Oxford. Research and Financial support by the German Academic Exchange Service (DAAD Stipend D/05/47437) is gratefully acknowledged. This paper's findings, interpretations, and conclusions are entirely those of the authors and do not necessarily represent the views of The Boston Consulting Group.

Electronic copy available at: http://ssrn.com/abstract=1028216

1 Introduction

According to corporate financial theory, the states of financial distress, default, and bankruptcy present a fundamental stage in the life-cycle of corporations that provokes substantial changes in the ownership of firms' residual claims and the allocation of rights to manage corporate resources [e.g. Jensen (1988), Wruck (1990)]. However, empirical results on how precisely these changes evolve have remained sparse and inconclusive.[1] For example, neoclassical models on financial distress typically suggest that default engenders a wholesale transfer of control to the firm's lenders who can costlessly restructure their claims to maximize firm value [e.g. Haugen and Senbet (1978)]. Yet the actual role of creditors in the restructuring of financially distressed firms has not been exhaustively scrutinized. Similarly, while financial theory traditionally proposes that managers personally suffer when their firms default or go bankrupt [e.g. Ross (1977)], there exists little evidence on what forces actually discipline managers in financially distressed firms. Finally, we currently know little about the intricate causes and consequences of control transfers in firms at the cusp of bankruptcy.

In this study we seek to address these and related issues by analyzing the following main questions: 1.) How do ownership structures change when firms are in distress, and 2.) Are ownership structure and changes therein related to management turnover when firms are in distress. By addressing the latter issue, we investigate the theoretic postulate that the relative effectiveness of alternative ownership and control structures is mirrored by their ability to replace poorly performing managers [see, e.g., Fama and Jensen (1983), Franks and Mayer (2001)].

Our contribution to the existing literature is threefold. First, our study provides evidence on distressed firms from a civil-law country, Germany, that has traditionally been considered as a country with rather weak shareholder and strong creditor protection [see LaPorta, Lopez-de Silanes, Shleifer, and Vishny (1998)]. Most existing studies have so far almost exclusively looked at the U.S. [see Altman and Hotchkiss (2006)].[2] However, the U.S. has a financial markets that is usually considered as having stronger shareholder and weaker creditor rights compared to Germany. Differences in legal regimes are likely to matter for changes in corporate control. Moreover, they possibly affect the power of the involved parties and hence influence the relationship between management turnover

[1] Most notable previous studies on corporate financial distress include Franks and Torous (1989) on reorganization of bankrupt firms under Chapter 11, Gilson (1989) on private costs of distress, Gilson (1990) on ownership and board composition of firms in default or bankruptcy, Gilson, John, and Lang (1990) on debt restructuring, and Gilson and Vetsuypens (1993) on CEO compensation. Wruck (1990) and Senbet and Seward (1995) provide surveys of the theoretic as well as empirical strands of literature.

[2] There is also a bit of evidence on the United Kingdom, see Franks and Mayer (2001).

Electronic copy available at: http://ssrn.com/abstract=1028216

and ownership structures when firms are in distress. Our paper therefore provides new insights by explicitly looking at a legal set-up that significantly differs from U.S.

Second, our study is executed in a bankruptcy framework that is particularly interesting for the analysis of changes in ownership and management. As we will show later, German corporations heavily engage in restructuring prior to actual bankruptcy. While roughly one-third of our sampled firms ultimately go bankrupt, formal proceedings appear to be protracted as long as possible. This sharply contrasts to previous evidence on distressed U.S. firms who tend to enter formal proceedings under Chapter 11 prematurely and thus perform a great deal of restructuring under court supervision [Franks and Torous (1989)]. This national peculiarity makes German data particularly interesting for studying the impact of financial distress as observed restructuring measures are not distorted by legal or regulatory influence but remain a matter of choice. Our analysis and findings are therefore interesting and relevant not only from a German but also from a more general finance and policy perspective.

Third, unlike the U.S. where companies tend to be widely held, ownership structures in Germany vary a great deal. An interesting aspect of our study is therefore the explicit consideration of the particularities of German ownership structures, which were traditionally characterized by ownership concentration, heterogeneity (ranging from private investors, banks, and strategic investors to management and directors) and dominance by large family investors. However, ownership structures have undergone substantial change in recent years [see Gorton and Schmid (2000)]. These factors provide us with a nice set-up to investigate the ownership dynamics of firms with various owner-types in a distress environment. Furthermore, they allow us to study the effects of different types of owners on management turnover by running a kind of "horse race" between them.

Our analysis is based on a sample of 267 German corporations that experienced back-to-back interest coverage shortfalls and steep share price declines between 1996 and 2002. This period coincides with the youngest economic crisis and the subsequent convalescence thereof and thus offers the analysis of a sample that was hitherto not obtainable. Our research design follows prior work by Gilson (1990) and Asquith et al. (1990) in that we (i) create a stratified sample of firms that meet a pre-determined distress-criterion at some time during the sampling interval and (ii) track each firm's development over the distress cycle. Firms exit the sample upon bankruptcy or financial recovery.

Our analysis follows a three-step approach. In a first step, we examine the impact of financial distress on corporate ownership. We find that ownership structures undergo substantial changes. Median ownership concentration, measured by a Herfindahl index, significantly declines from 26% in year -1 to 16% in year +4 relative to the onset of financial

distress. These results differ significantly from the evidence for the U.S. as documented, for example, by Gilson (1990). The decline in ownership concentration is mostly attributable to a systematic retreat of individual and family investors, traditionally the bulwark in corporate ownership structures in Germany. Conversely, ownership representation by banks and financial investors almost doubles over the same interval, although both groups of investors only acquire comparatively small stakes. Ownership by executive and non-executive directors also significantly increases over the distress interval. We also provide evidence on how firm characteristics and ownership structures in the year of distress are related to the documented ownership changes. The decline in ownership concentration, for example, seems to be weaker if firms have higher holdings of private and financial investors in the year of initial distress.

In a second step, we analyze how turnover of key-executives is affected by persisting distress. We find that average turnover rates in our sample are almost twice as high as conventional levels of turnover in Germany. Only 14% of the chief executives and 22% of the chairmen of the supervisory board who hold respective seats at the onset of financial difficulties are still in office at year +4 in distress time.

In a third step, we perform panel data regressions to investigate the relation between (changes in) corporate ownership and management turnover. After controlling for performance, we find that turnover is significantly affected by ownership composition and changes therein. For one, increasing ownership by executive and non-executive directors cannot insulate management from disciplinary turnover (a finding that differs, for example, from the evidence in Franks and Mayer (2001)). Also, turnover is not affected by overall ownership concentration or the size of holdings by private investors. Instead, turnover is mostly triggered by firm outsiders, especially banks and financial investors who acquire distressed claims through block investments and takeovers. Banks also replace managers upon defaults and in debt restructurings. Managerial tenure under financial distress is more affected by actual shifts in ownership and control rather than by absolute levels of ownership. Overall, this evidence suggests that corporate control mechanisms in Germany are still different from the U.S. (see Table 10.1 in Altman and Hotchkiss (2006) for an overview of U.S. studies). Our results are robust to alternative ownership specifications and definitions of management turnover and are not inflicted by panel attrition problems.

This study is structured as follows. Section 2 provides the theoretical background and derives the research questions. Section 3 provides the details of the sample selection, describes the data, and defines the key variables of interest. The empirical results, their

interpretation and robustness checks are contained in section 4. Section 5 concludes with a summary of the study's main findings and a brief outlook.

2 Theoretical Background, Related Literature, and Research Questions

In the empirical part of this paper, we look at two related questions: 1.) How do ownership structure change when firms are in distress?, and 2.) Are ownership structure and changes therein related to managerial turnover when firms are in distress? In this section, we provide a description of the hypotheses we have with regard to these two questions. Whenever possible, we hereby refer to theoretical models or related empirical evidence from other studies.

From an economic perspective, we expect that financial distress and corporate crises generally increase the need for effective monitoring. This amplified monitoring need should have implications for how ownership of different types of investors evolves during distress. In general, we would expect that ownership concentration increases as monitoring is facilitated due to lower free-rider effects if equity is not widely dispersed [see Shleifer and Vishny (1986)]. The paper by Gilson (1990) provides evidence consistent with this conjecture for distressed firms in the U.S. With regard to the evolution of different owner-types, we expect ownership by executive and non-executive directors to increase during distress as the incentive effects of equity-based compensation are greatest when firms are in a crisis [see Jensen and Meckling (1976) and Baker, Jensen, and Murphy (1988)]. However, directors are usually more wealth constraint and less diversified than, say, institutional investors. As a result of this, they might also be more hesitant to increase their ownership stakes in distress situations. The overall effect is therefore an empirical question. A similar argument can apply for private owners (such as families and individuals). On the one hand, they also have a need to reduce their holdings in distress to diversify risk. On the other hand, however, economic theory suggests that monitoring by private owners might be more effective in distress as they present ownership at the ultimate level and thus have better incentives to obey their fiduciary duties. By contrast, corporate owners such as industrial firms, insurance companies or mutual funds are fraught with additional agency conflicts and may be weaker monitors [see Von Thadden (1990)]. In Germany, this discrepancy is very pronounced due to the traditionally intensive ties between private shareholders and the firms they own. This argument would rather speak for an overall increase in the holdings by private investors.

Strategic and financial owners may be attracted by financial distress and are likely to increase their ownership positions to profit from distress situations (these types of investors are recently also called vulture investors). They may, for example, seek to actively contribute to the turnaround process if they dispose of the relevant industry and restructuring experience. Evidence consistent with this notion is provided by Hotchkiss and Mooradian (1997). They study a sample of 288 firms in distress and find that vulture investors gain control of more than 16% of these firms. Banks naturally get more involved when firms are in distress (see James (1995) and James (1995)). Banks can get (increased) ownership positions in distressed firms as they exchange their debt positions into equity holdings (e.g. through debt-to-equity swaps). However, the incentives to exchange debt into equity are frequently reduced due to the risk of subsequent payment obligations and due to unfavorable taxation rules imposed on the debtor.[3]

For our second question, we try to identify the disciplining role of different owner-types by looking at managerial turnover. Shleifer and Vishny (1986) show that ownership concentration mitigates free rider problems and increases the incentives to conduct effective monitoring. Their reasoning implies that a higher ownership concentration should be associated with larger turnover rates during financial distress. As formally documented in Scharfstein (1988), takeovers can also perform a role in disciplining incumbent management. In the case of distressed firms, this implicates that a management replacement is likely to follow the acquisition of a large block of shares. Similarly, Gilson (1989) shows that the increased involvement of banks during financial distress imposes a disciplinary effect on incumbent management and increases turnover. A likewise effect should hold for financial and vulture investors. Vulture investors, in particular, often have own management teams that are placed in the boards of their targets. The role of director holdings and holdings by private investors for managerial turnover are not formally modelled. However, one can expect that higher holdings of executive directors would rather mitigate managerial turnover. On the contrary, one can expect that the increased monitoring incentives that result from larger holdings by private investors generally have a positive effect on turnover. An overview of empirical studies that look at management changes for firms that are financially distressed is provided in Altman and Hotchkiss (2006). The paper by Demsetz and Villalonga (2001) provides a more general view of the effects of different owner-types (equity holdings by executive directors vs. equity holdings by other owners such as private owners, strategic or financial owners). Among other things, they point out how important it is to differentiate between different owner-types to properly understand the effects of monitoring on firm performance.

[3] The first case occurs if the value of the equity securities received exceeds that of the debt securities given. The second case is a special to German tax law.

3 Data Set and Definition of Variables

3.1 Sampling Procedure

Our sample of firms in financial distress is constructed as follows: We start off by identifying all publicly traded German corporations whose stock price and financial statement data are available on the German tapes of *Datastream* and *Worldscope*. The sampling interval embraces the years 1996-2003. The choice of the sample period results from data availability constraints: Mandatory ad-hoc publication of corporate news (such as restructuring-measures) are obtainable from no sooner than 1996, and 2003 was the last year for which financial statements were available when the sample was collected. From this population, we create a stratum of financially distressed firms using back-to-back interest coverage shortfalls as our instrument for stratification. In this manner, a firm enters the sample if in any two consecutive years—beginning in 1996—the firm's earnings before interest and taxes (Ebit) are less than its reported interest expense. Using insufficient interest coverage as an empirical proxy for financial distress directly reflects the flow based definition of distress which has been established in theory [e.g. Wruck (1990)]. Moreover, it also follows a widespread convention in the literature.[4] It also has the advantage that it presents an indicator of financial trouble for all firm types and does not impose any further restrictions on firm or capital structure characteristics. Our sample thus contains a more representative cross-section of financially troubled firms than if alternative, albeit more sophisticated, stratification criteria had been applied. One potential caveat with this approach, however, is that it deliberately excludes firms from the analysis that only suffer from minor or short-term financial difficulties.

After excluding observations from the financial services industry and after eliminating firms with insufficient financial statement coverage on *Worldscope* for at least one year, our sampling procedure yields a stratified sample of 267 firms (1016 firm-years). Similar to Gilson (1990) and Asquith, Gertner, and Scharfstein (1994), we use the following dating methodology to analyze financial distress. We start with year 0 which denotes the year of the initial interest coverage shortfall. For each firm in the sample, financial statement data, ownership information, and data on management and supervisory board composition are then tracked from year -1 onwards. In any given year, a firm exits the sample if it (i) files a formal bankruptcy petition or (ii) single-handedly recovers from financial distress. Bankrupt entities are excluded from further inspection because, contrary to most formal reorganizations under Chapter 11 of the U.S Bankruptcy Code,

[4] Among others, Asquith, Gertner, and Scharfstein (1994), and Hoshi, Kashyap, and Scharfstein (1990) use this sampling approach. Moreover, the Basel-Committee (2004), p. 131 uses interest coverage ratios for estimating a firm's default risk.

the vast majority of bankruptcy filings in Germany results in the liquidation of the debtor's estate. Formal bankruptcy in Germany is therefore mostly equivalent to ultimate failure (see, for example, Franks, Nyborg, and Torous (1996)). Conversely, firms that return to financial health are excluded so as to ensure that the observed changes in corporate control and management turnover are correctly attributed to the firms' feeble financial condition (otherwise the impact of distress on corporate restructuring could easily be overstated). Firms are considered as having recovered from distress if they fail to meet the underlying distress criterion in any two consecutive years after entering the sample.

The resulting calender time distribution of firms entering and exiting the stratum is depicted in Table 1. Evidently, the bulk of the sample entries is centered around the years 1999-2001. These years coincide with the zenith of the technology bubble and the onset of the general economic recession shortly afterwards. In consequence, about half of the firms entering the sample are listed on 'Neuer Markt', the former growth segment of the German Stock Exchange, which reflects the recession's relative impact on this particular sector of the economy. Roughly one third of all firms (76 firms) ultimately fail and file for bankruptcy. Table 1 shows that bankruptcies are most common at the height of the recession during the years 2001 and 2002. Most recoveries occur in 2004, the first year of overall economic convalescence. The remaining firms are either acquired somewhere along the distress cycle (55 firms) or are still pending in financial distress at the end of the sampling interval (96 firms). In the final sample, firms appear for a mean (median) of 3.56 (4.0) years. Only three firms appear the maximum number of nine years.

3.2 Sample Characteristics

For our subsequent analysis, data is obtained from different sources. Stock price and financial statement data is obtained from *Datastream* and *Worldscope*. Incomplete information is supplemented with data from the firms' annual reports and from the *Hoppenstedt* Financial Information Stock Guide. From the latter, we also obtain ownership data and information on management and supervisory board composition.

Table 2 contains selected summary statistics for our final sample of 267 firms (at year 0). The median firm in our sample has total assets worth 54.44 Mio. EUR and a market value of common equity of 49.49 Mio. EUR. By comparison, our firms are considerably smaller than the sampled firms in related studies by Asquith, Gertner, and Scharfstein (1994) and Gilson (1990). Corresponding values for total assets in these studies are 234.86 Mio. USD and 74.80 Mio USD, respectively. One explanation for these differences may be the recent sampling period in our study, which deliberately embraces the rise and fall

of relatively younger (and smaller) technology firms.[5] Our firms are also considerably smaller than their industry peers. Industry-adjusted data is based on median values of the universe of firms in *Worldscope* with the same two-digit FTSE Global Classification industry code. The median firm in our sample exhibits an extremely low interest coverage of -8.34 on a firm level (-9.08 on an industry level). Median leverage, defined as book value of total liabilities over book value of total capital, is 0.42. Perhaps surprisingly, our firms are only slightly higher leveraged than the median firms in their industry. This suggests that our firms' financial problems may be attributable less to overly rigorous interest obligations but rather to an above industry-average decline in operating profitability.

In order to detect how firms in our sample cope with their ongoing difficulties, we track corporate restructuring activities for each firm through a news research in the Börsenzeitung (the gazette of all German stock exchanges), in LexisNexis and in the DowJones&Reuters news retrieval. Collectively, these sources embrace all major German newspapers, electronic news-wires and trade register filings. Table 3 provides a synopsis of selected restructuring activities that were completed by our sample firms (presented in years relative to the onset of financial distress). Panel A shows the full sample including all 267 firms while Panel B excludes those 96 firms who where still pending in distress at the end of the sampling period. As the core focus of this paper is on corporate control, we restricted our attention to measures that directly affect the firms ownership and capital structures. Panel A shows that the most common financial response to distress by the firms in our sample is the infusion of fresh equity capital. In sum, we observe 117 equity issues, of which roughly one third (42 cases) are placed via rights issues while the remaining two thirds (75 cases) present private or public placements under the exclusion of subscription rights for existing owners. Debt restructurings take place in 64 and block-trades in 59 cases. Fresh equity is issued several times subsequent to write-downs of the par value of a firm's common stock (29 cases). These so called equity write-downs are completed to accommodate previously accumulated losses and often provide a last resort for over-indebted companies. Panel B shows that these general restructuring activity statistics also hold once we exclude the 96 firms that are still pending. However, in relative terms equity issues seem to be slightly less and takeovers (by definition) more likely.

Firms in our sample also heavily engage in debt restructuring. We follow Gilson, John, and Lang (1990) and define a debt restructuring as a transaction in which a firm obtains relief from its creditors either by a reduction or deferral of contractual payments,

[5] Indeed, neither Asquith, Gertner, and Scharfstein (1994) nor Gilson (1990) analyze NASDAQ listed firms, the counterparts of German Neuer Markt firms. Further below, we will discuss this issue in more detail.

a provision of fresh money, or the swap of debt securities against securities with residual or mezzanine claim. In contrast to U.S. evidence, unilateral relief from creditors in Germany is typically provided by house-banks who maintain close ties to their clients and thus incur fewer costs in a workout than, say, dispersed trade creditors. In consequence, the vast majority of debt restructurings in our sample present private renegotiations of bank debt.[6] Finally, firms in our sample are often subject to direct transfers of control through block investments, i.e. the engagement of new minority shareholders, and outright takeovers. Financial as well as strategic investors are the most active acquirers of substantial minority positions with about 40% of all transactions accounting to each of the two. Other types of investors, i.e. individuals, banks, and institutional investors only play a subordinate role. Table 3 also shows that restructuring activity tends to increase with enduring distress.

3.3 Determinants of Restructuring Outcomes

After having looked at the general characteristics of our sample firms, we try to get a better understanding of how firm characteristics are related to the observed type of the restructuring outcome (go bankrupt, get acquired, or recover). We therefore use a multinomial regression framework and regress the type of outcome on a set of firm and ownership characteristics (such as firm size, leverage, index listing or management ownership) and a dummy that captures management turnover. Firms still pending in the sample are defined as being the base case firms. The firm characteristics are measured in year 0, i.e. the year of the initial interest coverage shortfall. Management turnover is defined as as a change in the position of a company's top two executives (i.e. the CEO and the CFO) and measured over the available sample period. Our analysis in Table 4 shows that the observed outcome variable is unrelated to firm size, leverage, return on assets, and Tobin's Q. Furthermore, a listing at the Neuer Markt does not seem to be significantly related to the restructuring outcome. However, we have some evidence that suggests that firms that go bankrupt are significantly more likely to exhibit a management turnover (significant at the 1% level). Moreover, firms that are being acquired show a higher ownership concentration relative to the base case.[7] This finding suggests that takeovers are facilitated if ownership is very concentrated (see Shleifer and Vishny (1986)). Surprisingly, it also turns out that firms where management ownership in the year of distress is larger than 5% are significantly less likely to recover (compared to the base case). The sample size in Table 4 is less than 267 due to some data missings.

[6] With only 4 observations, public debt restructurings play a minuscule role in our sample.

[7] Ownership concentration is measured here with a dummy that is one if a firm has an owner that owns more than 50%).

3.4 Definition of Key Variables

For our empirical analysis, we need to construct a variable that measures the ownership concentration of the sample firms. Moreover, we need to measure discrete changes in ownership and have to detect in how far they are attributable to different types of owners. Finally, we also need a variable that measures management turnover.

3.4.1 Definition of Ownership Variables

Following earlier studies on corporate ownership in Germany, we use three different measures for the degree of ownership concentration in each firm [e.g. Gorton and Schmid (2000), Köke (2001)]. First, we use an approximation of the *Herfindahl* index, which measures the absolute level of concentration. The theoretical foundation for the use of the Herfindahl index as a measure for ownership concentration is provided by Demsetz and Lehn (1985). It is defined as $HI = \sum_{i=1}^{N} s_i^2$, where $s_i (i = 1, ..., N)$ is the fraction of common stock owned by the party i. Importantly, the Herfindahl index is based on equity control rights, i.e. on rights that descend from direct holdings of voting stocks. Thus, it does not include proxy votes. Second, we look at the size of the largest share block, *Top blockholder*, as well as at the combined stake of the three largest shareholders (*Top 3 blockholder*). The use of these measures is motivated by Shleifer and Vishny (1986) who argue that single blockholdings (rather than overall concentration) exert the strongest disciplinary effect on management. Finally, we explicitly consider the total *Freefloat* of a firm's shares as plausibility check for the former three measures. *Freefloat* is calculated as the residual from all share blocks reported by *Hoppenstedt*.

We use ownership information in *Hoppenstedt* to further distinguish different types of blockholders. We look at director blockholdings which are are holdings by (i) *Executive directors* (members of the executive board) or holdings by (ii) *Non-executive directors* (members of the supervisory board).[8] We also look at equity blockholdings of (iii) *Private investors* (family investors and individuals), (iv) *Banks*, (v) *Financial investors* (investment funds, insurance companies), or (vi) *Strategic investors* (non-financial firms and competitors). Furthermore, shareholdings by unspecified investors, public institutions, and employees as well as stakes held by the firm itself are commonly classified as (vii) *Miscellaneous* ownership.

[8] Note that German firms have a two-tier governance structure consisting of a management board and a supervisory board. The executive board consists of executive directors that are responsible for the day-to-day business of a corporation. The supervisory board consists of non-executive directors who are supposed to monitor the executive board.

Changes in ownership are measured in three ways, (i) variations in the Herfindahl index between years, (ii) block investments and (iii) takeovers. A *Block investment* (a dummy variable) is defined as the acquisition of a new minority stake by an outside investor (either through a blocktrade or a placement of new equity). By contrast, a *Takeover* is defined as an acquisition of a majority block of common shares (dummy variable). Block investments and takeovers are identified in LexisNexis and cross-checked with the annual edition of the *Hoppenstedt* Guide.

3.4.2 Definition of Management Turnover Variables

Following Gilson (1989) and Warner, Watts, and Wruck (1988), management turnover is defined as a change in position of a company's top two executives (i.e. the CEO and the CFO). In addition, we also consider the replacement of a firm's chairman of the supervisory board (documented in the robustness section). Turnovers are identified in LexisNexis and cross-checked with the annual edition of the *Hoppenstedt* Guide. Even though we would expect the majority of management replacements in our sample to take place involuntarily, there, of course, also occur regular changes such as retirements. Following Warner, Watts, and Wruck (1988), we consider all departures as unforced departures where the changes are due to (i) retirement, (ii) a change into advisory board, (iii) a change into bigger corporation, (iv) health, and (v) death.[9] By contrast, turnovers are classified as forced if they are due to (i) outright dismissal, (ii) resignation, or (iii) if no official reason was provided but the news coverage clearly indicates a disciplinary background. According to Gilson (1989), firms frequently do not comment management changes that result from dissatisfaction with managers' performance.

Table 5 summarizes definitions all variables and provides the corresponding data sources.

[9] The change of a former CEO into the supervisory board presents a German particularity that is heavily contested by the recently introduced German Corporate Governance Code. See Werder (2002).

4 Empirical Results

4.1 The Impact of Financial Distress on Ownership Structures

4.1.1 Descriptive Evidence on Ownership Dynamics

The main objective of this section is to investigate the impact of sustained financial distress on ownership and control of German corporations. Table 6 therefore presents changes in ownership concentration during financial distress. The sample size decreases over time as firms exit the sample due to recovery or bankruptcy and as ownership data is not available for all firms at all times. We thus focus on the six year interval ranging from years -1 to +4 although several firms are tracked for a longer time period.[10] From Table 6 it is apparent that ownership concentration substantially decreases in event time. The median Herfindahl index continuously declines from 26% in year -1 over 19% in year +1 to 16% in year +4. Corresponding figures for the share of the top blockholder (the combined share of the top three blockholdings) are 50%, 38%, and 36% (62%, 57%, and 53%), respectively. Conversely, firms' freefloat increases by almost 10 percentage points over the same interval. Decreases in ownership concentration (relativ to year -1) for all measures are statistically significant using a paired t-test for differences in means and a Wilcoxon signed-rank test for differences in medians.[11] This evidence conflicts with the proposition that ownership concentration increases under distress due to the increased monitoring need in financially distressed firms. Moreover, the results in Table 6 are inconsistent with Gilson (1990) who finds an increase in ownership concentration when firms are under distress.

A potential explanation for the discrepancy between our results and previous findings may lie in different points of departure for blockholders in the U.S. and Germany. In the U.S., shares are usually held by dispersed owners who need comparatively little stock accumulation in order to obtain a controlling interest in the firm. In Germany, by contrast, firms are typically held by majority owners who may continue to control the firm even after divesting significant fractions of their stakes. Alternatively, the type of blockholders in both countries may also explain the difference. In the U.S., the typical blockholder

[10] The smaller sample size in year -1 is attributable to the fact that a large number of firms entered the sample in the year following the going-public so that their inclusion could potentially bias the results. In year +5 the number of observations drops to 52, which makes year +4 a more reasonable upper end for the time frame. In our multivariate analysis in the subsequent section all observations are included and attrition is controlled for using a (quasi-) Hausman procedure as suggested by Verbeek and Nijman (1992).

[11] Both tests complete pairwise comparisons between two years and thus allow for different sample sizes over distress time.

is a well diversified institutional investor (e.g. mutual funds, pension funds, or private equity powerhouses) who deliberately invests in special situations such as distressed equity. German corporations, on the other hand, are frequently owned by individuals and families who are less diversified, more cash constraint and may thus exhibit a higher propensity to selling their stakes in an increasingly troubled company.

Evidence consistent with this argumentation is presented in Table 7, which describes the dynamics in the composition of ownership in distress time. Table 7 contains six groups of shareholders, (i) private investors, (ii) strategic investors, (iii) financial investors, (iv) banks, (v) executive directors, and (vi) non-executive directors. For each owner-type, two types of ownership information are provided. The top line values map the fraction of firms, in which a particular owner-type represents one of the top five shareholders. The bottom line values, depicted in parentheses, map average ownership shares in percent. Over the specified distress interval, we observe a substantial shift in the composition of ownership. First and foremost, private investors significantly reduce their investment. While at the time -1 private owners hold substantial shares in more than 76% of all firms, this frequency declines continuously to about 52% in year +4. In the same manner, their average ownership in our sample's firms declines from 35% to a mere 15%. The observed decline in private (i.e. family and individual) investors is statistically as well as economically significant. It is in line with the conjecture that private investors may be less inclined to hold claims of distressed equity over a sustained period of time. Since private investors present the largest owners in our sample their retreat also presents the most likely cause for the decline in overall ownership concentration that was illustrated in Table 6. Importantly, the decline in private ownership and overall ownership concentration over time is not driven by the firms in our sample that entered distress shortly after their initial public notation. Moreover, there are no insolvency or corporate governance rules in Germany that have caused the observed ownership changes.

Ownership by strategic and financial investors do not exhibit a statistically significant variation over the distress cycle. However, ownership by financial investors constantly increases from around 26% to 37% in relative frequency and from 6% to 10% in mean fraction of shares held. These figures clearly exceed conventional levels of financial ownership in German corporations, which Köke (2001) reports to be around 6% and may present a result of the increasing control transfer activity reported in Table 3.

Evidence on bank ownership during financial distress is more ambiguous. While average bank ownership does not increase significantly in distress time, the average number of firms, in which banks become major shareholders more than doubles from about 9% in year -1 to 19% in year +4. The observation that bank involvement proliferates under

continuing distress is consistent with the proposition that banks seem to be reluctant to increase their ownership stakes beyond a certain threshold. One reason for this incongruity certainly lies in the legal restrictions concerning bank ownership of distressed equity. Another explanation is that German banks who maintain close ties to their clients do not need large equity holdings in order to obtain a seat in the supervisory board and exert pressure on management. Instead, they often use proxy votes for deposit clients as well as frequent renegotiations of debt claims to gain influence on corporate decision making.

Panel B of Table 7 describes ownership by corporate directors over the distress cycle. Interestingly, ownership by executive and non-executive directors seems to increase significantly under financial distress. In year +4 corporate directors hold significant share blocks in more than 34% of all firms, compared with only 4% in year -1. Likewise, the overall fraction of shares held by directors increases from scantly 2% to almost 9%. Most of this rise is attributable to an increasing risk sharing by executive managers whose average stake rises from 2% in year -1 to 7.5% in year +4. This evidence is consistent with the proposition that incentive related benefits associated with stock based compensation of managers are greatest when a firms is operating unprofitably [e.g. Jensen and Meckling (1976)].[12]

4.1.2 Determinants of Ownership Dynamics

The main objective of this section is to investigate the determinants of the ownership changes during financial distress that were documented in the previous section. Table 9 and 10 therefore show OLS estimates of multivariate regressions relating ownership changes to a vector of firm and ownership characteristics. The dependent variable in these regressions is defined as the change in the respective ownership variable between year 0 and year 3 (e.g. in the Herfindahl index or in the shares held by strategic investors). Hereby, year 0 is the year of the initial interest coverage shortfall. All independent variables are measured in year 0. In our interpretation of the regressions, we focus on those ownership variables that showed significant changes during the distress period (see Table 6 and 7).

The tables show that the documented decrease in ownership concentration is negatively related to the holdings of private investors (families or individuals) as well as to the holdings of financial investors in the year of the initial distress. This finding holds irrespective of whether we measure ownership concentration by using the Herfindahl index or by

[12] We have no evidence suggesting that the increase in management ownership during the sample period is driven by equity given to new (replacement) managers. More specifically, we cannot find a significant relationship between managerial turnover and an increase in equity ownership by managers after the turnover event.

calculating the holdings of the largest blockholder. The negative relationship between initial holdings of private investors and the change in ownership concentration suggests that firms that initially have high holdings by families or individuals show a less pronounced decrease in ownership concentration. We also find that the increase in the equity holdings by executive and non-executive directors seems to be weaker if financial owners have larger equity holdings to begin with. We have no evidence suggesting that the changes in ownership by directors are related to the holdings of banks or other investors. The tables also show that the decline in the holdings by private investors is smaller if a firm is listed at the Neuer Markt and if it shows a higher degree of ownership concentration in year 0. Interestingly, the ownership reduction by private investors is stronger if the equity holdings of other owners (strategic investors, financial investors as well as banks) are larger in the initial period. This finding suggests that private investors trade their monitoring role against the cost of being undiversified. Private investors seem to be more willing to reduce their shares if they know that other blockholders are present and potentially willing to exercise monitoring. These substitution effects are also reflected in the positive coefficient of the private investor variable in the regressions in which we explain changes in holdings by financial and strategic investors. We cannot detect that the changes in bank ownership during distress are related to firm and ownership characteristics in a systematic manner.

4.2 The Impact of Financial Distress on Management Turnover

The replacement of top executives is a prevalent response to financial distress in our sample's firms.[13] Table 8 contains the time-series distribution of management turnover events for our sample over the period 1996-2004 (change in the position of a firm's top two executive directors). There is considerable variation in turnover rates over the sampled years, both, in terms of management changes per firm and in terms of the fraction of forced turnovers. However, amplitudes in both categories may be due to the relatively low number of observations in some years. Average annual turnover for the firms in the sample over the entire 1996-2004 interval amounts to 19%. This turnover number rather provides a conservative estimate of turnover risk given that managers whose companies go bankrupt (and hence leave our sample) lose their jobs. The average fraction of forced turnovers in our sample exceeds 80%, which indicates that premature departures of key executives in our sample is the rule rather than the exception. While previous evidence on management tenure in Germany is sparse, observed turnover rates clearly exceed conventional levels of turnover in German firms. Schrader and Lüthje (1995), for example, report average turnover rates of 11% for Germany's largest corporations during 1965-1993, 25%-35% of

[13] This is consistent with previous evidence by Ofek (1993) and Gilson (1989)

which occurred involuntarily. To control for differences in the sampling period, we also tracked turnover data for an unconditioned control sample of all Dax 100 corporations during the 1998-2003 interval.[14] Annual turnover rates for the control sample averaged 15%, roughly 50% of which were due to disciplinary departures. While these figures bear more resemblance to our sample of distressed firms, the difference in turnover rates suggests that executive directors in troubled firms experience significantly shorter tenure than their counterparts in non-distressed entities.[15]

Complimentary evidence on how turnover is affected by financial distress is provided in Figure 1. Similar to Gilson (1989), we track the survival of senior managers over the distress cycle. The figure depicts the fraction of Chief Executive Officers (*CEO*) and the chairmen of the supervisory board (*Chairman*) who were incumbents in year -1 and who remained in office over the six-year interval centered around the onset of financial distress. Two insights are striking: First, survival of both directors steeply declines after year +1, with only 43% and 14% of original incumbents remaining in office beyond years +2 and +4, respectively. The increases in turnover are economically as well as statistically significant. Corresponding p-values of paired t-test for differences in mean turnover between years -1 and +4 and between years +1 and +2 are 0.000 and 0.006, respectively. Second, the turnover pattern of the chairmen, while not equally sensitive to performance, very much resembles that of the CEOs. While the causality is not clear, the evidence suggests that in the pursuit of survival CEOs and chairmen of the supervisory board depend on each other. By contrast, CEOs in our DAX 100 control sample bear significantly lower job-risks. When tracked over an unconditioned period of 6 years (during 1998 and 2003), 56% of managers are still in office at the end of the interval. Combined, the evidence in this section is consistent with the proposition that management turnover is significantly affected by the financial condition of fims and that managers suffer large personal costs of financial distress.

4.3 The Impact of Ownership Structure on Management Turnover

The above analyzes suggest that ongoing financial distress provokes substantial changes in the ownership of firms' equity claims as well as in the allocation of rights to manage corporate operations. What remains unaddressed to this point is the relation between

[14] The Dax 100 comprises the 100 largest corporations in terms of market capitalization and is the most representative cross-section of publicly listed firms in Germany. A detailed description of the data can be obtained in Jostarndt, Rudolph, and Thierauf (2005).

[15] In fact, the observed difference understates abnormal turnover in financially distressed firms if one considers that managers in large corporations usually exhibit longer tenure, ceteris paribus. See Gilson (1989) and our evidence below.

these two. As discussed earlier, theoretical arguments hold that the structure of corporate ownership and changes therein should directly influence managerial turnover. In this section, we investigate this relation in a multivariate setting. In a first step, we look at the relationship between ownership structures and management turnover. In a second step, we then look at the effects of changes in ownership on the likelihood of a management change. As the second step allows a more direct test of our hypothesis, we provide a more lengthy interpretation of the results at that point.

4.3.1 The Impact of Ownership Structures

To investigate the determinants of management turnover, we estimate ordinary probability models that simultaneously relate the incidence of a forced management departure to measures of leverage, performance (accounting and stock price performance), ownership and a set of control variables. The dependent variable in the regressions is a dummy that equals one if a management turnover (change in the position of both the CEO and the CFO) is observed in a given firm-year, and zero otherwise. We control for firm-size and industry affiliation. Firm-size is measured by the natural *Logarithm of total assets*. We control for firm size because previous studies suggest that management turnover may differ between smaller and larger firms. To account for differences between so-called old and new economy firms, we include a dummy variable (*Neuer Markt*) that equals one if a firm was formerly listed in the growth segment of the German Stock Exchange.

Table 11 contains estimation results from random effects logit regressions of management turnover on four different sets of exogenous variables. To facilitate a comparison of our results with previous studies on management turnover, we restrict our attention in Model 1 to the measures for indebtedness, corporate performance and to the controls.[16] Our results confirm earlier evidence by Gilson (1989) for a stratified sample and Warner et al. (1988) for a random sample. The estimated coefficients of the *Stock return* variable and the *Return on assets* variable have the predicted negative signs and are highly statistically significant.[17] Thus, turnover tends to increase rapidly in response to poor prior performance.[18] Furthermore, an increase in corporate leverage also provokes higher rates of management turnover. We also find that firm size has a positive effect on management

[16] In our robustness section, we also account for the time relative to the onset of distress.

[17] The same holds if performance is measured by industry adjusted values of the return variables (not reported).

[18] To mitigate the hazard of multicollinearity between market and book measures of performance, we include lagged values of the latter and contemporaneous values of the former. The results, however, are robust to variations in the use of either lagged or contemporaneous as well either firm-level or industry-adjusted measures of performance (see also Warner, Watts, and Wruck (1988)). Furthermore, an inspection of the correlation matrix of the set of independent variables also does not suggests that multicolinearity is a concern for our analysis (see Table 13). Note that the negative and significant

change. Higher turnover for larger firms in our sample is consistent with previous evidence by Gilson (1989). A potential explanation for the positive impact of firm size might be that bigger firms have larger internal labor markets and may therefore find it less costly to replace senior executives [e.g. Furtado and Rozeff (1987)]. However, it turns out that the vast majority of successors for the replaced managers in our sample come from outside the firm. This suggests that internal labor markets and internal replacements are of little importance for successions at the top executive level of our firms. An alternative explanation for the positive effect of firm size might be that the replacement of executives in larger firms is cheaper as the management of larger firms requires less firm-specific human capital and thus offers less scope for entrenchment [e.g. Shleifer and Vishny (1989)]. The dummy variable *Neuer Markt* is insignificant in all models which suggests that succession patterns do not differ between so-called old and new economy firms.

Departing from this basic specification, the regression model is gradually expanded by including variables on director ownership (model 2), ownership concentration (model 3), and ownership shares held by different types of blockholders (model 4). Overall, the results in Table 11 show the following (a more detailed interpretation is provided below):

First, after controlling for leverage and firm performance, larger holdings by executive and non-executive directors do not affect the likelihood of a management turnover. Second, turnover is not related to ownership concentration and to holdings by private shareholders. Third, increased outside ownership by strategic investors, financial investors, and banks significantly affects management turnover of firms in our sample. This result suggests that amid the retreat of private investors, the comparatively little stakes of corporate (strategic or financial) investors and banks gain more weight, which in turn increases their monitoring incentives (and ability).

Our finding of no effect of both ownership concentration and shareholdings by private owners on turnover rates conflicts with the view which says that due to improved monitoring incentives, firms with concentrated ownership and private blockholders are more likely to experience management changes (compared to firms with dispersed holdings of shares). Also, this finding collides with previous evidence on cross-sections of U.S. and German firms. Denis et al. (1997) and Jostarndt, Rudolph, and Thierauf (2005), for example, both find that ownership concentration significantly increases turnover. However, our result appears more plausible when considered along with our evidence on changes in ownership structure when firms are in distress (see Table 7). Private shareholdings and with it total ownership concentration were shown to decrease significantly over the distress interval. Thus, when high ownership concentration is vastly attributable to substantial

intercept makes sure that our model matches the unconditional probability of the turnover event (so that the covariates capture the variation in turnover).

stakes of private investors but private investors demonstrably decrease their stakes in response to distress, it is not surprising that the commonly expected relation between ownership concentration and disciplinary management turnover no longer holds. Instead, this relationship provides support for the hypothesis that financial distress provokes an overall shift from internal to external monitoring. As Jensen and Ruback (1983) and John and Senbet (1998) point out, external mechanisms of control are most active when established forces surrender the job or fail to work effectively.

4.3.2 The Impact of Changes in Ownership Structures

This section analyzes the relation between management turnover (change in the position of both the CEO and the CFO) and actual shifts in corporate ownership and control of distressed firms. In this manner, explicit changes in ownership, rather than absolute levels are the subject of our analysis. As noted earlier, shifts in corporate control of distressed firms may occur in three separate ways: Block investments, takeovers, and debt restructurings by banks. We distinguish block investments by whether the acquirer is a financial or a strategic investor. This set-up allows us to asses the relative importance of banks, financial investors, and strategic investors in the external monitoring of distressed firms in a kind of horse race.

The regression results are reported in Table 12. Point of departure is our basic turnover model that contains measures of leverage, performance and ownership concentration as well as a set of controls. The documented results show that the estimated coefficients for leverage, stock return, return on assets, and firm size are in line with the findings of previous section. Model 5 of Table 12 explicitly tests the effect of bank monitoring on turnover. We therefore include dummy variables that indicate whether a default or a debt restructuring took place. Since actual defaults are hard to observe in practice, we use mandatory filings in accordance with § 91 of the German Companies Act (AktG) as our proxy for default.[19] The evidence in model 5 provides strong support for the view that banks conduct active monitoring. The estimated coefficients of both the default and the debt restructuring variable are positive and significant. These results are also consistent with our evidence from model 4 of Table 11 where we documented that bank ownership has a positive and significant impact on turnover. The documented results on bank monitoring are particularly striking given the low ownership levels that banks seem to have in the sample firms (see Table 7). It also turns out that banks were in many cases not shareholders in the distress firms to begin with but rather received equity stakes (and

[19] According to § 91 I AktG, a firm must publicly announce if it has lost more than half of its equity book value to accommodate its losses. In this respect, the filing marks a discrete increase in leverage and thus a significant control shift to creditors.

thus direct control rights) within reorganization plans. Moreover, only a small fraction of out-of-court reorganizations in Germany involves debt-to-equity swaps where banks can increase their equity stakes. This suggests that banks do not require large amounts of equity in order to enforce their will on corporate control and management change.

The results in Model 5 also show that increases in the equity ownership by executive directors does not insulate top executives from disciplinary replacements. This finding is inconsistent with previous results by Denis et al. (1997) and Franks et al. (2001) who both observe a negative and significant impact of executive ownership on management turnover. Our results is surprising given that shareholdings by firm insiders were found to increase substantially over the distress interval (see Table 7). Our evidence is, however, consistent with an argument in Gilson (1990). He argues that under ongoing financial turbulence, internal monitoring by the board of directors may no longer suffice to provoke the required organizational change. Moreover, the insensitivity of turnover to managerial holdings indicates that turnover in beleaguered firms may not solely reflect an incentive problem but also, increasingly, a competence problem.[20] Interestingly, we also cannot detect any effect of changes in ownership concentration on management turnover. This result is also consistent with the previous finding of no effect of ownership concentration on turnover (see Table 11).

Model 6 looks at the impact of block investments on management turnover. Block investments were defined as the acquisition of a minority stake in a distressed firm by outside investors. We hereby distinguished between strategic investors (non-financials and competitors) and financial investors (investment funds and insurance firms). The regression results show that both variables have the predicted positive and significant effects on management turnover. Considering the comparatively little stakes that were acquired by financial investors (see Table 7), their influence on turnover is remarkable. Such investors who deliberately invest in distressed targets and actively engage in the firm's restructuring present a comparatively novel trend on the German capital market. They have also received considerable attention in the financial press and from policymakers. Prominent examples that are also included in our sample are Apollo's investment in Primacom AG in 2004 and Wyser-Pratte's investment in Babcock Borsig AG in 2002. Both investments were quickly followed by a premature departure of the firm's key executives. Our results are also consistent with recent U.S. evidence by Hotchkiss and Mooradian (1997) who

[20] As a practitioner puts it: "[When] you're walking into a room that is characterized by despair, failure, and frustration. With all these people sitting together, the first thing that has to happen is the venting of outrage against the schmucks who got them there in the first place. [...] It's hard to tank a billion dollars of debt and then offer yourself as the savior to your creditors." Sam Zell, Chairman, Equity and Financial Management Company, quoted in the Journal of Applied Corporate Finance Roundtable Discussion on "Bankruptcies, Workouts, and Turnarounds", April 1991.

find that so-called "vulture investors" take active monitoring roles in distressed firms and increase firm value by disciplining culpable managers. Our results also suggest that the activity of these investors is to a large extent responsible for our turnover results.

A similar picture emerges for takeovers. In model 7, we add the *Takeover* variable along with the block investment variables. Recall that the *Takeover* variable takes the value one if a majority of shares has been bought by an outside investor. Its estimated coefficient is positive and significant at the 10% level. This result corresponds with the theoretical arguments by Scharfstein (1988) which states that managers' job risk increases after takeovers. However, the effect is statistically and economically weaker than the one for block investments. Unfortunately, we are unable to distinguish takeovers by the exact type of acquirer due to a limited number of takeovers involving financial bidders. However, strategic bidders (competitors and non-financials) clearly outnumber financials and other investors by accounting for roughly 80% of all acquisitions. In model 8, all four forces on the market for corporate control are tested simultaneously. All findings from models 5-7 are confirmed in model 8. The results suggest that in disciplining management, all forces work as compliments rather than substitutes.[21] A comparison of the χ^2 statistics between Table 11 and Table 12 suggests that management turnover in financially distressed firms is better explained by actual shifts in ownership and control than by their absolute levels.

4.4 Robustness Checks

In order to confirm the robustness of our results several specification tests were performed. In principle, concerns with the robustness of our findings, may stem from (1) our measurement of our ownership variables and its impact on turnover, (2) our definition of management turnover, (3) attrition resulting from the use of unbalanced panel data, (4) the large number of firms from the 'Neuer Markt', and (5) the influence of the boom and bust period. We address these concerns below.

A. Ownership Specification

Objection against the application of our ownership variables might surface because of the omission of interaction terms between ownership and performance. Turnover models that include interaction terms (i.e. *turnover=f(performance, ownership, ownership×performance, controls)*) are frequently applied to test whether ownership per se and in combination

[21] A correlation matrix of the independent variables is presented in Table 14. Again, an inspection of the correlation does not suggest that multicollinearity is a problem in our analysis.

with poor performance matters for management changes.[22] Since, by design, all firms in our sample perform poorly, the difference between both measures (only ownership and ownership interacted with performance) should be negligible. However, to ensure the comparability of our results with previous studies, we augment our specification in Table 14 by two sets of interaction terms. We multiply our ownership variables by (i) *Distress duration* (the number of years spent in distress in a particular firm-year since the onset of distress) and (ii) *Loss* (a dummy variable that equals one if a firm's Ebitda is negative and zero otherwise). The underlying assumption is that monitoring by blockholders should intensify as performance further deteriorates. The obtained estimation results (not reported) show that the our results are robust to the inclusion of these interaction terms. In particular, our core findings on the insignificance of overall ownership concentration and the significance of ownership by banks and financial blockholders are robust to modifications in the model.

Furthermore, we also tested whether the omission of a potentially non-linear relationship between ownership and turnover could have impacted our results. Following, among others, McConnell and Servaes (1990), we inspect potential non-linearities in the ownership-turnover relation by augmenting our basic model with quadratic terms of executive director's ownership (*Executive director ownership*^{2}), ownership concentration (*Top blockholder*^{2}), private ownership (*Priv ownership*^{2}), and strategic ownership (*strat ownership*^{2}). When added to the regression, the quadratic ownership terms do indicate some non-linearities in the turnover equation (results not reported). Especially for private ownership, turnover tends to increase at low levels of private holdings and decreases as owners assemble larger blocks. However, the effects are not robust to alternative specifications of the model. In addition, none of the observed non-linearities on ownership concentration, strategic ownership and management ownership are statistically significant. This evidence provides further support for our result that ownership concentration as well as insider ownership have no substantial (linear or non-linear) effect on management tenure in financially distressed firms.

B. Turnover Definition

We also examine to what extent our results depend on our definition of management turnover. Therefore, we re-estimate each of our logit specifications with three distinct alterations in the dependent variable. First, we include all departures of firms' CEOs and CFOs irrespective of an alleged disciplinary background in the analysis. Second, we focus on CEO departures only (disregarding CFO departures). In cases where the

[22] Powers (2005) surveys this strand of literature.

premature departure of a CFO actually presents a "pawn-sacrifice" of the CEO, including such departures into the management turnover definition could potentially overstate the efficacy of internal and external monitoring mechanisms.[23] Third, we restrict our attention solely to removals of the chairmen of the supervisory board (the leading non-executive director). If, as popularly claimed, there exists a widespread "ride together—die together" attitude between key non-executives and their chairman of the supervisor board, turnover patterns of both should bear some resemblance.

Non-reported estimation results for these alternative turnover definitions showed the following: The first two alternative definitions (all turnovers and CEO turnovers only) produce results that are virtually identical to our results with original definition of management turnover. As expected, however, the impact of performance on turnover in both variations is somewhat smaller than reported throughout this text. This result is most likely attributable to the deliberate inclusion of voluntary resignations in these models. The regressions also show that the turnover of the chairmen of the supervisory board is only poorly explained by our specifications. Solely takeovers strongly affect the turnover of chairmen. This evidence is consistent with earlier findings on supervisory board turnover in Germany [e.g. Franks and Mayer (2001)] and suggests that turnover of non-executive directors occurs less performance-related but mostly within regular successions.

C. Panel Attrition and Selectivity Bias

One important feature of our data sample is its unbalanced panel structure. This structure results from two factors. First, the unbalanced structure is a deliberate feature of our research design because we exclude firms from further inspection after bankruptcy and recovery. Second, our sample is afflicted by missing data points, which is due to incomplete time-series of data in *Worldscope* and *Hoppenstedt* for some firms and variables.

Missing observations in panel data can cause biases and inconsistencies in the regression estimates if the encountered non-response is endogenously determined. For example, in our context the regression model may under- or overstate the impact of distress on corporate control activities if firms with longer time-series of available data are systematically different from firms that exit early. One computationally convenient approach to check for sample selectivity bias in panel data is to perform an Added-Variable procedure (or Quasi-Hausman test) as suggested by Verbeek and Nijman (1992). To deal with these issues, we define an indicator variable ($response_{it}$) which is equal to one if the dependent and all independent variables are observed in a given period, and 0 otherwise. Next, we

[23] However, since only about one fifth of all turnovers in our analysis actually involve departures of CFOs this problem should be less pronounced.

construct an attrition variable which is defined as $attrition_i = \sum_{t=1}^{T} response_{it}$ and indicates the total number of periods i is observed. Then we include $attrition_i$ as an additional regressor in our random-effects logit model. Under the null-hypothesis of non-selective response in our panel structure, the estimated coefficient for the added variable is statistically insignificant and the applied model is appropriate. Under the alternative hypothesis of sample selectivity, however, the coefficient is non-zero and static panel data models yield biased and inconsistent estimation results [Wooldridge (2002)]. We estimate several models with this modified specification. We find that the estimated coefficients of the attrition variable are negative but statistically insignificant in all specifications.[24] The results hence suggest that our findings are not affected by biases resulting from endogenous panel data attrition.

D. Influence of Neuer Markt Firms and Rise and Fall of Technology Bubble

Roughly half of the firms in the sample were listed on the former growth segment of the German Stock Exchange (Neuer Markt). This might have potentially influenced our results. We therefore performed several robustness checks to see to what extent the large number of Neuer Markt firms affected our finings.

In a first step, we investigated whether Neuer Markt firms were more likely to file for bankruptcy or to recover. Therefore, we replicated the analysis in Table 1 and now only look at firms from the Neuer Markt segment. Out of the 154 Neuer Markt firms, 22.1% (34 firms) exited the sample due to bankruptcy and 14.2% (22 firms) due to recovery. The respective numbers of the full sample where 28.5% and 13.8%. Overall, these number suggest very similar patterns. However, it seems that firms from the growth segment where a bit less likely to exit the sample due to bankruptcy.

We also reproduced our analysis of Table 6 (corporate ownership concentration in distress time) by excluding all Neuer Markt firms. We find that for the subsample of firms not formally listed on Neuer Markt, i.e. so called old economy firms, the analysis of changes in ownership concentration around financial distress does not differ from the whole sample. We hence have no evidence suggesting that the inclusion of firms from the Neuer Markt has biased our results on ownership change. As documented in the regression analyzes, we also included a Neuer Markt dummy in all management turnover regressions. Again, we have no evidence that the firms listed at the Neuer Markt behaved differently from all other firms.

[24] For the sake of brevity the results of the Verbeek and Nijman (1992) procedure are also not reported.

One principle objection to the generality of our results could be made. Since our sampling period embraces the rise and fall of the technology hype towards the end of the last decade it is not clear ex ante if and how this affects our results. On the one hand, turnover in technology-intensive industries during boom periods could be lower because managers in such firms may be better entrenched due to higher firm-specific human capital [see, e.g., Shleifer and Vishny (1989)]. On the other hand, turnover rates could also be higher as firms require managers with different types of expertise to manage firms that have grown fast and now suffer from problems (e.g. a shift from technological knowledge to the ability of restructure a large organizations).

To address these issues, our analyzes not only controlled for affiliation with the so-called new economy (Neuer Markt firms) but also accounted for several time-windows within our sampling period. In particular, we accounted for the period of the technology hype. The results from all regressions where we accounted for different time periods do not suggest that there is a potentially distorting influences of the boom and bust period. The effects were all statistically as well as economically small. However, since we provide the first empirical study covering this epoch it is yet to be determined whether the obtained evidence is specific to our sample. We are therefore careful with the generalizations of our results for more tranquil periods.

5 Summary and Conclusions

This study provides a first insight into the anatomy of financial distress in German firms. We find a strong indication for an attenuation in internal monitoring efficiency. Private investors, traditionally a bulwark in corporate ownership structures in Germany, substantially reduce their ownership stakes and thereby cease to be an effective source of managerial control. Management turnover, which clearly exceeds conventional levels of turnover in Germany, is insensitive to overall ownership concentration and concentration of private ownership. Moreover, stock-based compensation of insiders, although increasing under distress, neither fosters nor substitutes the disciplinary replacement of key-executives. Conversely, monitoring by external forces fortifies under financial distress. Amid the retreat of private investors, ownership representation by banks and financial investors almost doubles under continuing distress. In consequence, disciplinary management turnover is mostly triggered by banks and outside investors and often occurs subsequent to control transfers through debt restructurings, block investments, and takeovers.

One interpretation of our findings is that protracted distress causes a gradual shift from internal to external mechanisms of corporate control. Alternatively, the observed

control changes may be due to a shift from identifiable to non-identifiable control mechanisms. If turnover rates increase despite decreasing ownership concentration, this may be a result of less scope for management for colluding with incumbent blockholders. To our knowledge, this is a genuine finding that has not been documented before. However, several open questions remain. For example, we cannot decipher what exactly induces private investors to sell their ownership in response to distress. Our results suggest that liquidity and risk aversion are central issues, however this may be only an ostensible explanation. Furthermore, our results suggests that managers incur high personal costs of financial distress. Yet we cannot substantiate whether these costs are sufficiently high to have a commensurable impact on day-to-day corporate policy decisions. In this respect, we hope our study can give a fresh impetus for further research on the causes and consequences of corporate financial distress.

Table 1: Time Series of Sample Composition

Calender time distribution of sample consisting of 267 German corporations that suffered from financial distress between 1996 and 2003. A firm is classified as financially distressed, if in any two consecutive years—beginning 1996—the firm's earnings before interest and taxes (EBIT) is less than its reported interest expense.

Sample year	Firms entering and exiting stratum over sampling interval		
	Firms entering	Exit due to bankruptcy	Exit due to recovery
1996	37	0	0
1997	12	0	0
1998	22	0	1
1999	53	2	4
2000	77	5	3
2001	45	17	4
2002	21	32	2
2003	0	13	7
2004	0	7	16
Total	267	76	37
(in %)		28.5%	13.8%

Table 2: Summary Statistics of Sample Firms

Selected mean and median attributes for the sample of 267 German corporations that suffered from financial distress between 1996 and 2003. A firm is classified as financially distressed, if in any two consecutive years—beginning 1996—the firm's earnings before interest and taxes (Ebit) is less than its reported interest expense. Figures relate to year 0 in distress time, i.e. the year of the initial coverage shortfall. Variables are reported on firm-level as well as net of industry effects. Leverage is book value of total liabilities to book value of total capital. Coverage presents Ebit over total interest expenses. Return on assets is Ebit before depreciation and amortization (Ebitda) over total assets. Stock return is the cumulative one-year return of a firm's common stock. Industry-adjusted values are based on the universe of firms with the same two-digit FTSE Global Classification industry code.

	Firm-level data			Industry-adjusted data			
Variable	Mean	Median	Std. dev.	Mean	Median	Std. dev.	N
Assets in Mio EUR	279.76	54.44	1030.29	-1243.23	-151.51	3054.55	267
Market value equity in Mio EUR	240.18	49.49	1025.68	-136.78	-2.69	1028.33	267
Coverage	-112.50	-8.34	460.56	-115.63	-9.08	469.39	267
Leverage	0.46	0.42	0.33	0.12	0.01	0.42	267
Return on assets	-0.09	-0.04	0.22	-0.17	-0.11	0.22	267
Stock return	-0.33	-0.48	0.85	-0.21	-0.49	0.73	122

Source: Worldscope

Table 3: Corporate Restructuring Activities in Distress Time

Selected restructuring measures undertaken relative to the onset of financial distress. Figures in Panel A are based on a sample of 267 German corporations between 1996 and 2004. Figures in Panel B are based only on those 171 firms that are not any more pending in financial distress at the end of the sample period. Figures may include multiple observations per firm. All data are obtained from text analyses conducted in the Börsenzeitung, LexisNexis, and the DowJones&Reuters news retrieval.

Panel A (Full Sample)	Corporate restructuring activity in years elapsed relative to onset of financial distress						
	-1	0	+1	+2	+3	≥+4	Total (in %)
Equity issue	3	10	28	36	19	21	117 (36.1%)
Equity write-down	0	0	2	6	9	12	29 (8.9%)
Debt restructuring	0	7	7	15	19	16	64 (19.7%)
Block-trades	0	10	11	18	11	9	59 (18.2%)
Takeover	0	4	11	10	11	19	55 (17.0%)

Panel B (excl. firms pending in distress)	Corporate restructuring activity in years elapsed relative to onset of financial distress						
	-1	0	+1	+2	+3	≥+4	Total (in %)
Equity issue	2	6	16	20	8	7	59 (28.5%)
Equity write-down	0	0	2	4	6	6	18 (8.7%)
Debt restructuring	0	5	4	6	10	11	36 (17.4%)
Block-trades	0	8	8	12	6	5	39 (18.8%)
Takeover	0	4	11	10	11	19	55 (26.6%)

Table 4: Determinants of Restructuring Outcome

Multinomial logistic regressions. The dependent variable is the outcome of the restructuring activity. The base case firm is a firm that is still pending in the sample. The other outcomes are (i) bankruptcy, (ii) getting acquired, and (iii) recovery. All independent variables except management turnover are measured in year 0, i.e. in the year of initial financial distress. Management turnover is measured over the entire sample size. The table reports coefficient estimates and robust standard errors. *, **, and *** denote the parameters are statistically significant at the 10%, 5%, and 1% level, respectively.

	Coefficient	Standard Error
Outcome 1:	Bankruptcy	
Assets (Log)	-0.176	0.160
Leverage	1.523	0.950
Return on Assets	1.412	1.137
Tobin's Q	0.005	0.016
Blockholder	0.121	0.376
Exec. director ownership	0.437	0.410
Neuer Markt	-0.555	0.458
Management Turnover	1.033	0.380***
Constant	0.831	1.804
Outcome 2:	Acquisition	
Assets (Log)	0.111	0.133
Leverage	-1.453	1.067
Return on Assets	-0.390	0.822
Tobin's Q	-0.071	0.046
Blockholder	0.884	0.394**
Exec. director ownership	-0.608	0.408
Neuer Markt	-0.062	0.429
Management Turnover	0.429	0.449
Constant	-1.718	1.550
Outcome 3:	Recovery	
Assets (Log)	0.122	0.151
Leverage	-0.343	1.042
Return on Assets	0.781	0.840
Tobin's Q	-0.042	0.033
Blockholder	0.336	0.429
Exec. director ownership	-0.843	0.458*
Neuer Markt	0.147	0.538
Management Turnover	-0.0288	0.509
Constant	-1.789	1.798
N(obs.)		257
Wald-χ^2		46.20
$Prob¿\chi^2$		0.0042
$PseudoR^2$		0.0709

Table 5: Definition of Variables and Data Sources

Variable	Definition	Data source
Panel A: Ownership data		
Herfindahl	Herfindahl index across all blocks of common voting stock defined as $HI = \sum_{i=1}^{N} s_i^2$, where $s_i (i = 1, ..., N)$ is the fraction of common stock owned by the party i.	Hoppenstedt Financial Information Stock Guide
Top blockholder	Size of the largest share block of common voting stock	Hoppenstedt Financial Information Stock Guide
Top 3 blockholder	Sum of the three largest share blocks of common voting stock	Hoppenstedt Financial Information Stock Guide
Exec. director ownership / Non-exec. director ownership	Share of common voting stock held by members of the executive board / members of the supervisory board	Hoppenstedt Financial Information Stock Guide
Private ownership	Share of common stock held by families or individual investors (shares held by different family members were aggrageted)	Hoppenstedt Financial Information Stock Guide
Strategic ownership	Share of common voting stock held by non-financial corporates	Hoppenstedt Financial Information Stock Guide
Financial ownership	Share of common voting stock held by investment funds, private equity funds, and insurance companies	Hoppenstedt Financial Information Stock Guide
Bank ownership	Share of common voting stock held by corporate and investment banks	Hoppenstedt Financial Information Stock Guide
Panel B: Restructuring data		
Debt restructuring	Out-of-court reduction or deferral of contractual payments, provision of fresh money, or swap of claims (dummy variable)	LexisNexis and Dow Jones&Reuters news retrieval
Default	Mandatory filing in accordance with § 91 I of the German Companies Act (AktG) (dummy variable)	LexisNexis and Dow Jones&Reuters news retrieval
Block investment	Acquisition of minority stake of common voting stock by outside investor through blocktrade or placement of new shares (dummy variable)	LexisNexis and Hoppenstedt Financial Information Stock Guide
Takeover	Acquisition of majority block of common voting stock by outside investor (dummy variable)	LexisNexis and Hoppenstedt Financial Information Stock Guide

Table 6: Corporate Ownership Concentration in Distress Time

The development of corporate ownership concentration for alternative measures of concentration relative to the onset of financial distress. Figures are based on a sample of 267 German corporations between 1996 and 2004. The *Herfindahl* index represents the mean (median) level of concentration of all of a firm's stakes of common shares larger than 5%. It is defined as $HI = \sum_{i=1}^{N} s_i^2$, where $s_i (i = 1, ..., N)$ is the fraction of common stock owned by the party i. *Top blockholder* represents the mean (median) ownership stake of the firm's single largest blockholder. *Top 3 blockholder* represents the combined mean (median) ownership of the firm's largest three blockholders. All data are obtained from *Hoppenstedt* Financial Information Stock Guide. Test statistics are based on a simple two-sided t-test of differences in means and on a non-parametric Wilcoxon signed-rank test on differences in medians. *, **, and *** denote the ownership percentage is significantly different from percentage in year -1 at the 10%, 5%, and 1% level, respectively.

	Ownership concentration in years elapsed relative to onset of financial distress					
	-1	0	+1	+2	+3	+4
Herfindahl	0.318	0.256 **	0.261 **	0.253 **	0.238 ***	0.271 *
	(0.262)	(0.199)***	(0.192)***	(0.161)***	(0.161)***	(0.162)***
Top blockholder	0.484	0.417 ***	0.420 **	0.413 ***	0.400 ***	0.420 *
	(0.499)	(0.380)***	(0.380)**	(0.346)***	(0.346)***	(0.360)**
Top 3 blockholder	0.630	0.580 *	0.570 **	0.550 ***	0.540 ***	0.530 ***
	(0.623)	(0.600)*	(0.570)**	(0.540)***	(0.532)***	(0.530)***
Freefloat	0.330	0.340	0.356	0.382 **	0.402 ***	0.414 ***
	(0.332)	(0.310)	(0.342)	(0.370)**	(0.393)***	(0.420)***
N	155	235	248	233	187	93

Table 7: Corporate Ownership Composition in Distress Time

Corporate ownership data by type of blockholder and relative to the onset of financial distress. Figures are based on a sample of 267 German corporations between 1996 and 2004. For each owner-type, two types of ownership information are provided. The top line values represent the fraction of firms, in which a particular owner-type belongs to the top five shareholders. The bottom line values, depicted in parentheses, map average ownership shares in percent. All data are obtained from *Hoppenstedt* Financial Information Stock Guide. Test statistics are based on a simple two-sided t-test of differences in means and on a non-parametric Wilcoxon signed-rank test on differences in medians. *, **, and *** denote the ownership percentage is significantly different from percentage in year -1 at the 10%, 5%, and 1% level, respectively.

	Ownership composition in years elapsed relative to onset of financial distress					
	-1	0	+1	+2	+3	+4
Panel A: Ownership non-management blockholders						
Private	0.763	0.783	0.761	0.706 *	0.689 ***	0.519 ***
	(0.353)	(0.329)	(0.310)	(0.248)***	(0.215)***	(0.155)***
Strategic	0.348	0.311	0.340	0.364	0.407	0.392
	(0.164)	(0.134)	(0.150)	(0.164)	(0.167)	(0.171)
Financial	0.259	0.362	0.324	0.333	0.347	0.367
	(0.066)	(0.076)	(0.070)	(0.074)	(0.075)	(0.100)
Bank	0.089	0.094	0.109	0.140	0.168 *	0.190 **
	(0.022)	(0.017)	(0.023)	(0.030)	(0.028)	(0.037)
Misc.	0.037	0.055	0.040	0.051	0.056	0.036
	(0.012)	(0.013)	(0.009)	(0.009)	(0.013)	(0.019)
Panel B: Ownership by management blockholders						
Exec. directors	0.044	0.072	0.065	0.110 **	0.144 **	0.291 ***
	(0.019)	(0.033)	(0.028)	(0.039)*	(0.049)**	(0.075)***
Non-exec. directors	0.000	0.021	0.016	0.018	0.030 **	0.051 **
	(0.000)	(0.003)	(0.003)	(0.004)	(0.008)**	(0.012)**
Combined	0.044	0.094	0.081	0.127 *	0.174 **	0.342 ***
	(0.019)	(0.036)	(0.031)	(0.043)*	(0.057)**	(0.087)***
N	155	235	248	233	187	93

Table 8: Management Turnover during Sampling Period

Sample distribution of 251 senior management changes in 267 financially distressed firms during the period 1996-2004. Management turnover is defined as a change in position of the company's top two executive directors, i.e. the CEO and the CFO. Turnovers are identified through a news research in the Börsenzeitung, LexisNexis, and the DowJones&Reuters news retrieval and cross-checked with the annual edition of *Hoppenstedt* Financial Information Stock Guide.

Year	Number of firms	All management changes	Management changes per firm	Share of forced departures
1996	37	8	0.22	0.88
1997	49	7	0.14	0.86
1998	61	4	0.07	1.00
1999	108	14	0.13	0.93
2000	177	35	0.20	0.77
2001	201	75	0.37	0.76
2002	188	59	0.31	0.85
2003	168	33	0.20	0.91
2004	145	16	0.11	1.00
Total	267	251	0.19	0.88

Table 9: Determinants of Ownership Changes (Regressions I-IV)

OLS estimates of multivariate regressions relating ownership changes to a vector of explanatory variables. Regressions are based on a panel of 267 German corporations that suffered from financial distress between 1996 and 2004. The dependent variable in the regressions is defined as the change in the respective ownership variable between year 0 and year 3 (e.g. in the Herfindahl index). Year 0 is defined as the year of the initial interest coverage shortfall. All independent variables are measured in year 0. *Assets* is the (lagged) natural logarithm of book value of total assets. *Leverage* is (lagged) book value of total debt over book value of common equity plus book value of total debt. *Return* represents the (lagged) one-year buy-and-hold return of a firm's common stock. *Return on assets* is Eearnings before interest taxes depreciation and amortization (Ebitda) over total assets. *Neuer Markt* presents a dummy variable that equals one if the firm was listed on the former growth segment of the German stock exchange, and zero otherwise. All ownership variable definitions are from Table 5. The two columns of each model contain the coefficient estimates and robust standard errors, respectively. *, **, and *** denote the parameters are statistically significant at the 10%, 5%, and 1% level, respectively.

	Herfindahl		Top Blockholder		Exec./non-exec. ownership		Private ownership	
	Coeff.	se	Coeff.	se	Coeff.	se	Coeff.	se
Assets (Log)	-0.003	(0.008)	0.003	(0.012)	-0.007	(0.005)	0.019	(0.011)
Leverage	-0.061	(0.061)	-0.165	(0.088)	0.076	(0.055)	-0.159	(0.083)*
Stock return	-0.008	(0.015)	-0.006	(0.021)	0.000	(0.006)	0.012	(0.181)
Return on assets	0.0623	(0.056)	0.076	(0.086)**	0.031	(0.026)	-0.012	(0.083)
Neuer Markt	0.042	(0.032)	0.035	(0.045)	-0.002	(0.015)	-0.078	(0.036)**
Herfindahl					0.015	(0.025)	-0.321	(0.109)***
Exec. director owner.	-0.079	(0.076)	0.013	(0.114)			0.396	(0.080)***
Non-exec. director owner.	0.080	(0.150)	0.014	(0.204)			0.453	(0.177)**
Private ownership	-0.193	(0.076)**	-0.225	(0.091)**	0.003	(0.028)		
Strategic ownership	-0.078	(0.082)	-0.111	(0.098)	0.016	(0.035)	0.194	(0.082)**
Financial ownership	-0.217	(0.120)*	-0.321	(0.171)*	-0.097	(0.056)*	0.198	(0.107)*
Bank ownership	-0.194	(0.241)	-0.197	(0.331)	-0.064	(0.068)	0.245	(0.133)*
Constant	0.053	(0.097)	0.018	(0.136)	0.072	(0.073)	-0.227	(0.137)*
N(obs.)	224		224		224		224	
R^2	0.072		0.072		0.059		0.150	

Table 10: Determinants of Ownership Changes (Regressions V-VII)

OLS estimates of multivariate regressions relating ownership changes to a vector of explanatory variables. Regressions are based on a panel of 267 German corporations that suffered from financial distress between 1996 and 2004. The dependent variable in the regressions is defined as the change in the respective ownership variable between year 0 and year 3 (e.g. in the Herfindahl index). Year 0 is defined as the year of the initial interest coverage shortfall. All independent variables are measured in year 0. *Assets* is the (lagged) natural logarithm of book value of total assets. *Leverage* is (lagged) book value of total debt over book value of common equity plus book value of total debt. *Return* represents the (lagged) one-year buy-and-hold return of a firm's common stock. *Return on assets* is Eearnings before interest taxes depreciation and amortization (Ebitda) over total assets. *Neuer Markt* presents a dummy variable that equals one if the firm was listed on the former growth segment of the German stock exchange, and zero otherwise. All ownership variable definitions are from Table 5. The two columns of each model contain the coefficient estimates and robust standard errors, respectively. *, **, and *** denote the parameters are statistically significant at the 10%, 5%, and 1% level, respectively.

	Strategic ownership		Financial ownership		Bank ownership	
	Coeff.	se	Coeff.	se	Coeff.	se
Assets (Log)	0.001	(0.010)	0.008	(0.007)	-0.002	(0.004)
Leverage	-0.101	(0.084)	-0.027	(0.055)	0.033	(0.027)
Stock return	-0.018	(0.017)	0.027	(0.014)*	-0.000	(0.006)
Return on assets	-0.001	(0.048)	0.002	(0.052)	-0.008	(0.021)
Neuer Markt	-0.020	(0.029)	-0.018	(0.026)	0.007	(0.008)
Herfindahl	-0.323	(0.108)***	-0.093	(0.107)	0.054	(0.068)
Exec. director owner.	0.089	(0.084)	0.161	(0.103)	0.026	(0.027)
Non-exec. director owner.	0.098	(0.108)	0.190	(0.200)	0.043	(0.086)
Private ownership	0.148	(0.079)*	0.203	(0.095)**	0.049	(0.040)
Strategic ownership			0.167	(0.088)*	-0.014	(0.027)
Financial ownership	0.143	(0.074)*			0.034	(0.026)
Bank ownership	0.187	(0.091)**	-0.283	(0.171)*		
Constant	-0.079	(0.111)	-0.118	(0.099)	-0.011	(0.042)
N(obs.)	224		224		224	
R^2	0.147		0.111		0.059	

Table 11: Management Turnover and Ownership Structures (Panel Regressions I-IV)

Random-Effects Maximum Likelihood estimation of logistic regressions relating senior management turnover (change in the position of a company's CEO and CFO) to a vector of explanatory variables. Regressions are based on a panel of 267 German corporations that suffered from financial distress between 1996 and 2004. The dependent variable equals one if the turnover event is observed in a given firm-year and zero otherwise. *Assets* is (lagged) the natural logarithm of book value of total assets. *Leverage* is (lagged) book value of total debt over book value of common equity plus book value of total debt. *Return* represents the (lagged) one-year buy-and-hold return of a firm's common stock. *Return on assets* is earnings before interest taxes depreciation and amortization (Ebitda) over total assets. *Neuer Markt* presents a dummy variable that equals one if the firm was listed on the former growth segment of the German stock exchange, and zero otherwise. Ownership definitions are from Table 5. The two columns of each model contain the coefficient estimates and asymptotic standard errors, respectively. *, **, and *** denote the parameters are statistically significant at the 10%, 5%, and 1% level, respectively. The Wald χ^2-statistic tests the hypothesis that all the variables in the model are simultaneously equal to zero. ρ measures the proportion of the total variance contributed by the panel-level (between) variance component.

	Model 1		Model 2		Model 3		Model 4	
	Coeff.	se	Coeff.	se	Coeff.	se	Coeff.	se
Assets (Log)	0.217	(0.071)***	0.219	(0.071)***	0.223	(0.071)***	0.213	(0.069)***
Leverage	0.849	(0.495)*	0.827	(0.492)*	0.735	(0.499)	0.757	(0.496)
Stock return	-0.582	(0.108)***	-0.585	(0.107)***	-0.572	(0.108)***	-0.568	(0.106)***
Return on assets	-0.681	(0.307)**	-0.677	(0.306)**	-0.716	(0.307)**	-0.702	(0.306)**
Exec. director ownership			-0.395	(0.871)	-0.439	(0.874)	0.798	(1.087)
Non-exec. director ownership			3.040	(2.510)	2.793	(2.492)	3.955	(2.509)
Herfindahl					-1.943	(1.543)	-2.204	(1.639)
Top blockholder					1.657	(1.378)	0.864	(1.492)
Private ownership							0.951	(0.699)
Strategic ownership							1.291	(0.741)*
Financial ownership							1.705	(0.815)**
Bank ownership							2.721	(0.944)***
Neuer Markt	0.286	(0.234)	0.290	(0.233)	0.212	(0.239)	0.273	(0.239)
Constant	-4.957	(0.855)***	-4.971	(0.849)***	-5.124	(0.861)	-5.315	(0.865)***
N(obs.)	914		914		914		914	
N(firms)	267		267		267		267	
Wald-χ^2	42.11	***	43.72	***	45.15	***	53.78	***
ρ	0.085		0.074		0.069		0.032	

Table 12: Management Turnover and Ownership Changes (Panel Regressions V-VIII)

Random-Effects Maximum Likelihood estimation of logistic regressions relating senior management turnover (change in the position of a company's CEO and CFO) to a vector of explanatory variables. Regressions are based on a panel of 267 German corporations that suffered from financial distress between 1996 and 2004. The dependent variable equals one if the turnover event is observed in a given firm-year and zero otherwise. *Assets* is the (lagged) natural logarithm of book value of total assets. *Leverage* is (lagged) book value of total debt over book value of common equity plus book value of total debt. *Return* represents the (lagged) one-year buy-and-hold return of a firm's common stock. *Return on assets* is Eearnings before interest taxes depreciation and amortization (Ebitda) over total assets. *Neuer Markt* presents a dummy variable that equals one if the firm was listed on the former growth segment of the German stock exchange, and zero otherwise. Remaining variable definitions are from Table 5. The two columns of each model contain the coefficient estimates and asymptotic standard errors, respectively. *, **, and *** denote the parameters are statistically significant at the 10%, 5%, and 1% level, respectively. The Wald χ^2-statistic tests the hypothesis that all the variables in the model are simultaneously equal to zero. ρ measures the proportion of the total variance contributed by the panel-level (between) variance component.

	Model 5		Model 6		Model 7		Model 8	
	Coeff.	se	Coeff.	se	Coeff.	se	Coeff.	se
Assets (Log)	0.211	(0.072)***	0.236	(0.072)***	0.244	(0.072)***	0.228	(0.072)***
Leverage	0.500	(0.507)	0.863	(0.494)*	0.900	(0.496)*	0.552	(0.506)
Stock return	-0.554	(0.108)***	-0.583	(0.108)***	-0.587	(0.108)***	-0.569	(0.109)***
Return on assets	-0.576	(0.313)**	-0.709	(0.305)**	-0.726	(0.307)**	-0.615	(0.314)**
Herfindahl	-0.218	0.450	-0.228	(0.444)	-0.328	(0.448)	-0.341	(0.451)
Exec. director ownership	0.259	0.355			0.329	(0.358)	0.289	(0.355)
Debt restructuring	1.230	(0.378)***					1.176	(0.375)***
Default	1.163	(0.658)*					1.219	(0.652)*
Block investment (Financial)			1.986	(0.679)***	2.028	(0.682)***	2.098	(0.677)***
Block investment (Strategic)			1.214	(0.545)**	1.215	(0.544)**	1.085	(0.548)**
Takeover					0.792	(0.459)*	0.763	(0.456)*
Neuer Markt	0.260	(0.236)	0.233	(0.235)	0.233	(0.236)	0.221	(0.236)
Constant	-4.824	(0.866)***	-5.161	(0.859)	-5.279	(0.869)	-5.070	(0.872)***
N(obs.)	913		914		914		913	
N(firms)	267		267		267		267	
Wald-χ^2	52.87	***	53.40	***	55.09	***	64.52	***
ρ	0.071		0.063		0.065		0.053	

Table 13: Correlation Matrix of Independent Variables in Panel Regression I-IV

Correlation matrix of independent variables used in Table 11. Variable definitions are from Table 11 and 5. Each column contains correlation coefficients and and their respective p-values in parentheses below.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
(1)	Assets (log)	1.000												
(2)	Leverage	0.066	1.000											
		(0.024)												
(3)	Stock return	0.056	0.076	1.000										
		(0.087)	(0.016)											
(4)	Return on assets	0.150	-0.043	-0.023	1.000									
		(0.000)	(0.106)	(0.457)										
(5)	Neuer Markt	-0.243	-0.108	-0.169	-0.075	1.000								
		(0.000)	(0.000)	(0.000)	(0.004)									
(6)	Herfindahl	0.249	-0.017	0.093	0.029	-0.198	1.000							
		(0.000)	(0.532)	(0.002)	(0.254)	(0.000)								
(7)	Top blockholder	0.272	-0.012	0.050	0.024	-0.143	0.953	1.000						
		(0.000)	(0.643)	(0.093)	(0.343)	(0.000)	(0.000)							
(8)	Exec. director ownership	0.001	-0.003	-0.056	0.008	0.012	0.134	0.173	1.000					
		(0.965)	(0.917)	(0.059)	(0.753)	(0.614)	(0.000)	(0.000)						
(9)	Non-exec. director ownership	-0.009	-0.002	0.017	0.002	0.031	-0.011	0.021	0.041	1.000				
		(0.739)	(0.936)	(0.564)	(0.951)	(0.194)	(0.654)	(0.372)	(0.085)					
(10)	Private ownership	0.006	0.013	-0.087	0.055	0.137	0.233	0.356	-0.148	-0.060	1.000			
		(0.825)	(0.637)	(0.004)	(0.033)	(0.000)	(0.000)	(0.000)	(0.000)	(0.011)				
(11)	Strategic ownership	0.201	-0.050	0.070	-0.005	-0.140	0.600	0.546	-0.080	-0.043	-0.235	1.000		
		(0.000)	(0.057)	(0.020)	(0.833)	(0.000)	(0.000)	(0.000)	(0.001)	(0.072)	(0.000)			
(12)	Financial ownership	0.042	0.002	0.003	-0.018	-0.058	0.140	0.178	-0.029	-0.001	-0.089	-0.077	1.000	
		(0.133)	(0.936)	(0.918)	(0.479)	(0.015)	(0.000)	(0.000)	(0.222)	(0.981)	(0.000)	(0.001)		
(13)	Bank ownership	0.189	0.051	0.047	0.019	-0.133	0.100	0.118	-0.034	-0.024	-0.058	0.003	-0.021	1.000
		(0.000)	(0.054)	(0.113)	(0.471)	(0.000)	(0.000)	(0.000)	(0.151)	(0.319)	(0.015)	(0.888)	(0.369)	

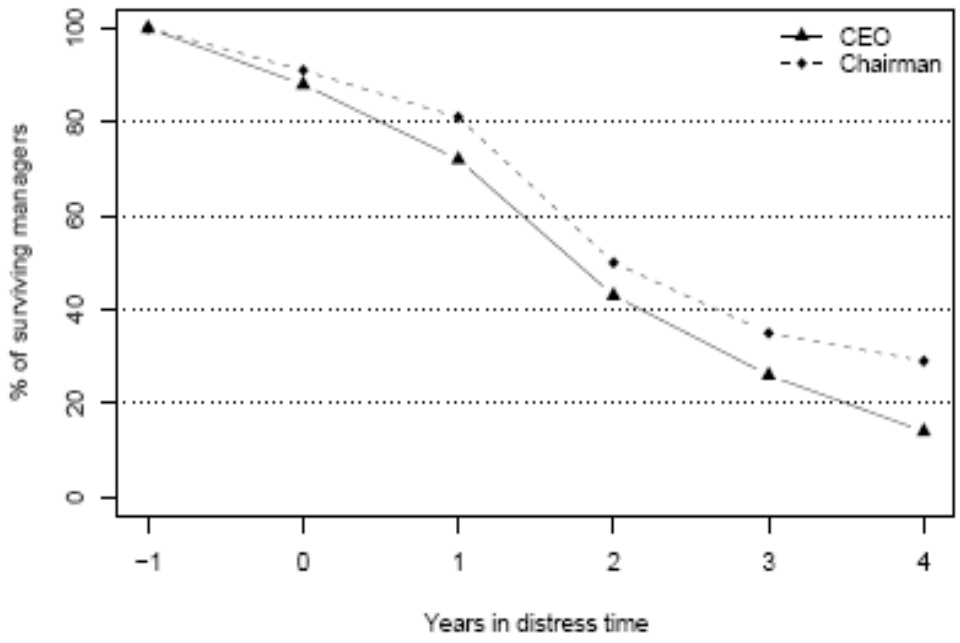
Table 14: Correlation Matrix of Independent Variables in Panel Regression V-VIII

Correlation matrix of independent variables used in Table 12. Variable definitions are from Tables 12 and 5. Each column contains correlation coefficients and and their respective p-values in parentheses below.

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1)	Assets (log)	1.000											
(2)	Leverage	0.066	1.000										
		(0.024)											
(3)	Stock return	0.056	0.076	1.000									
		(0.087)	(0.016)										
(4)	Return on assets	0.150	-0.043	-0.023	1.000								
		(0.000)	(0.106)	(0.457)									
(5)	Neuer Markt	-0.243	-0.108	-0.169	-0.075	1.000							
		(0.000)	(0.000)	(0.000)	(0.004)								
(6)	Herfindahl	0.249	-0.017	0.093	0.029	-0.198	1.000						
		(0.000)	(0.532)	(0.002)	(0.254)	(0.000)							
(7)	Exec. director ownership	-0.064	-0.026	-0.088	-0.033	-0.017	0.053	1.000					
		(0.023)	(0.335)	(0.003)	(0.205)	(0.466)	(0.025)						
(8)	Debt restructuring	0.161	0.079	-0.072	0.017	-0.052	0.004	0.015	1.000				
		(0.000)	(0.003)	(0.016)	(0.517)	(0.029)	(0.877)	(0.538)					
(9)	Default	-0.041	0.043	0.026	-0.071	-0.075	0.034	0.029	0.032	1.000			
		(0.158)	(0.107)	(0.384)	(0.007)	(0.002)	(0.162)	(0.232)	(0.191)				
(10)	Block investment (Financial)	0.013	-0.002	-0.014	-0.009	0.048	-0.008	0.011	0.008	-0.017	1.000		
		(0.633)	(0.933)	(0.646)	(0.724)	(0.044)	(0.740)	(0.654)	(0.756)	(0.489)			
(11)	Block investment (Strategic)	0.019	-0.003	0.013	0.021	-0.032	0.012	-0.011	0.118	0.017	-0.012	1.000	
		(0.505)	(0.925)	(0.671)	(0.425)	(0.178)	(0.606)	(0.644)	(0.000)	(0.488)	(0.623)		
(12)	Takeover	0.001	-0.014	0.043	-0.015	-0.001	0.122	-0.001	0.017	0.059	-0.019	0.010	1.000
		(0.965)	(0.592)	(0.150)	(0.568)	(0.981)	(0.000)	(0.967)	(0.483)	(0.016)	(0.420)	(0.662)	

Figure 1: Management survival relative to onset of financial crisis

Survival rates of senior managers and directors in 267 financially distressed firms during the period 1996-2004. The figure depicts the fraction of Chief Executive Officers and chairmen of the board of directors who were incumbents in year -1 and remain in office over the six-year interval centered around the onset of financial distress. Turnovers are identified through a news research in the Börsenzeitung, LexisNexis, and the DowJones&Reuters news retrieval and cross-checked with the annual edition of *Hoppenstedt* Financial Information Stock Guide.



Bibliography

Altman, E. I., and E. Hotchkiss (2006): *Corporate Financial Distress and Bankruptcy.* John Wiley and Sons, New York.

Asquith, P., R. Gertner, and D. Scharfstein (1994): "Anatomy of Financial Distress: An Examination of Junk-Bond Issuers," *The Quarterly Journal of Economics*, 109, 625–658.

Baker, G. P., M. C. Jensen, and K. J. Murphy (1988): "Compensation and Incentives: Practice Vs. Theory," *The Journal of Finance*, 43, 593–616.

Basel-Committee (2004): *International Convergence of Capital Measurement and Capital Standards: A Revised Framework.* Bank for International Settlements, Basel, SW.

Demsetz, H., and K. Lehn (1985): "The Structure of Corporate Ownership: Causes and Consequences," *Journal of Political Economy*, 93, 1155–1177.

Demsetz, H., and B. Villalonga (2001): "Ownership structure and corporate performance," *Journal of Corporate Finance*, 7, 209–233.

Fama, E. F., and M. C. Jensen (1983): "Separation of Ownership and Control," *Journal of Law and Economics*, 26, 301–325.

Franks, J., and C. Mayer (2001): "Ownership and Control of German Corporations," *The Review of Financial Studies*, 14, 943–977.

Franks, J. R., K. Nyborg, and W. Torous (1996): "A Comparison of US, UK, and German Insolvency Codes," *Financial Management*, 25, 19–30.

Franks, J. R., and W. N. Torous (1989): "An Empirical Investigation of U.S. Firms in Reorganization," *The Journal of Finance*, 44, 747–769.

Furtado, E., and M. Rozeff (1987): "The Wealth Effects of Company Initiated Management Changes," *Journal of Financial Economics*, 18, 147–160.

Gilson, S. C. (1989): "Management Turnover and Financial Distress," *Journal of Financial Economics*, 25, 241–262.

——— (1990): "Bankruptcy, Boards, Banks, and Blockholders," *Journal of Financial Economics*, 27, 355–387.

Gilson, S. C., K. John, and L. H. Lang (1990): "Troubled Debt Restructurings, An Empirical Study of Private Reorganization of Firms in Default," *Journal of Financial Economics*, 27, 315–353.

Gilson, S. C., and M. R. Vetsuypens (1993): "CEO Compensation in Financially Distressed Firms: An Empirical Analysis," *The Journal of Finance*, 48, 425–458.

Gorton, G., and F. A. Schmid (2000): "Universal Banking and Performance of German Firms," *Journal of Financial Economics*, 58, 29–80.

Haugen, R., and L. Senbet (1978): "The Insignificance of Bankruptcy Costs to the Theory of Optimal Capital Structure," *The Journal of Finance*, 33, 383–393.

Hoshi, T., A. Kashyap, and D. S. Scharfstein (1990): "The Role of Banks in Reducing the Costs of Financial Distress in Japan," *Journal of Financial Economics*, 27, 67–88.

Hotchkiss, E. S., and R. M. Mooradian (1997): "Vulture Investors and the Market for Corporate Control of Distressed Firms," *Journal of Financial Economics*, 43, 401–432.

James, C. (1995): "When Do Banks Take Equity in Debt Restructurings?," *The Review of Financial Studies*, 8, 1209–1234.

Jensen, M. C. (1988): "Takeovers: Their Causes and Consequences," *Economic Perspectives*, 2, 21–48.

Jensen, M. C., and W. Meckling (1976): "Theory of the Firm: Managerial Behavior, Agency Costs, and Ownership Structure," *Journal of Financial Economics*, 3, 305–360.

Jensen, M. C., and R. S. Ruback (1983): "The Market for Corporate Control: The Scientific Evidence," *Journal of Financial Economics*, 11, 5–50.

John, K., and L. W. Senbet (1998): "Corporate Governance and Board Effectiveness," *Journal of Banking and Finance*, 22, 371–403.

Jostarndt, P., B. Rudolph, and M. Thierauf (2005): "Unternehmenskontrolle und Management-Disziplinierung in Deutschland: Neue Ergebnisse," in *Handbuch Mergers and Acquisitions Management*, ed. by B. Wirtz, pp. 203–228, Wiesbaden. Gabler.

Köke, J. (2001): "New Evidence on Ownership Structures in Germany," *Kredit und Kapital*, 14, 257–292.

LaPorta, R., F. Lopez-de Silanes, A. Shleifer, and R. W. Vishny (1998): "Law and Finance," *Journal of Political Economy*, 106.

McConnell, J. J., and H. Servaes (1990): "Additional Evidence on Equity Ownership and Corporate Value," *Journal of Financial Economics*, 27, 595–612.

Ofek, E. (1993): "Capital Structure and Firm Response to Poor Performance," *Journal of Financial Economics*, 34, 3–30.

Powers, E. A. (2005): "Interpreting Logit Regressions with Interaction Terms: An Application to the Management Turnover Literature," *Journal of Corporate Finance*, 11, 504–522.

Ross, S. (1977): "The Determinants of Financial Structure: The Incentive-Signalling Approach," *Bell Journal of Economics*, 8, 23–40.

Scharfstein, D. S. (1988): "The Disciplinary Role of Takeovers," *Review of Economic Studies*, 55, 185–200.

Schrader, S., and C. Lüthje (1995): "Das Ausscheiden der Spitzenführungskraft aus dem Unternehmen," *Zeitschrift für Betriebswirtschaftslehre*, 65, 468–492.

Senbet, L. W., and J. K. Seward (1995): "Financial Distress, Bankruptcy and Reorganization," in *Finance*, ed. by R. A. Jarrow, V. Maksimovic, and W. T. Ziemba, pp. 921–957, Amsterdam, N.H. Elsevier.

Shleifer, A., and R. W. Vishny (1986): "Large Shareholders and Corporate Control," *Journal of Political Economy*, 94, 461–488.

——— (1989): "Management Entrenchment: The Case of Manager-Specific Investments," *Journal of Financial Economics*, 25, 123–139.

Verbeek, M., and T. Nijman (1992): "Testing for Selectivity Bias in Panel Data Models," *International Economic Review*, 33, 681–703.

Von Thadden, E.-L. (1990): "On the Efficiency of the Market for Corporate Control," *Kyklos*, 43, 635–658.

Warner, J. B., R. L. Watts, and K. H. Wruck (1988): "Stock Prices and Top Management Changes," *Journal of Financial Economics*, 20, 461–492.

Werder, A. V. (2002): "Der Deutsche Corporate Governance Kodex: Grundlagen und Einzelbestimmungen," *Der Betrieb*, 55, 801–810.

Wooldridge, J. M. (2002): *Econometric Analysis of Cross-Section and Panel Data*. MIT Press, Cambridge, MA.

Wruck, K. H. (1990): "Financial Distress, Reorganization, and Organizational Efficiency," *Journal of Financial Economics*, 27, 419–444.