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Essays on Empirical Corporate Governance

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Introduction

1 Overview

Corporate governance has been a very topical issue in the public and academic discussion of recent years. In particular, since the start of the current financial and economic crisis many politicians and the press have blamed flawed corporate governance mechanisms as premier cause for the failure of financial and non-financial corporations. As a consequence, most governments around the world currently discuss additional regulations of private enterprises. In Germany, for example, the government started a legislative initiative to regulate management compensation in order to prevent excessive risk taking and to make managers more long-term oriented. In this context, the question arises why shareholders and market mechanisms have failed to provide managers with the right incentives to maximize firm value and whether the causal relationship implied by the current debate indeed exists. The public discussion mostly overlooks these issues, which highlights why empirical corporate governance research is important, to give policy makers unbiased and economically founded advice before regulatory steps are taken.

This dissertation contributes to different areas in empirical corporate governance: composition of boards of directors (Chapter II), agency costs of free cash flow and the influence of large (institutional) blockholder (Chapter III), managerial preferences and the market for corporate control (Chapter IV), and insider trading (Chapter V). Before I briefly outline each of the Chapters, I introduce in more detail the subject of corporate governance and its roots in the separation of ownership and control in the modern corporation. I relegate the detailed discus-

sion of the relevant literature in each of the different areas studied and the empirical issues faced to the respective Chapters II to V.

2 Corporate governance

The book of Berle and Means (1932) is widely regarded as the starting point of the academic discussion about corporate governance (see, for example, Tirole, 2006, p. 15). They were the first who documented that the separation of ownership and control is a problem of economic and empirical relevance.[1] Berle and Means showed that already in 1929 almost half of the 200 largest U.S. non-financial corporations had no shareholder owning more than 20% of the corporation's stock. Based on this observation they argue that the dispersion of shareholders creates substantial discretion of managers over corporate resources, which those are likely to abuse. Since then, the understanding of corporate governance has developed tremendously. Today it is well accepted that managers do not necessarily act in the best interest of the capital providers. On the one hand, the academic literature has documented a large number of problems connected to managerial moral hazard, including low managerial effort, inefficient investments, private benefits, self-dealing, and the manipulation of accounting numbers. On the other hand, the literature has also identified possibilities to alleviate the problem of moral hazard by aligning the interests of managers and providers of capital. These possibilities can be grouped in two broad categories (1) tying executive compensation to firm performance and (2) monitoring of management activities by current and future investors. Therefore, the dominant view of economics on the subject of corporate governance is that it "deals with the ways in which the suppliers of finance to corporations assure themselves of getting a return on their investment" (Shleifer and Vishny, 1997).

[1] Becht, Bolton, and Röell (2005) cite a number of authors, who already discussed the problems associated with the separation of ownership and control before Berle and Means (1932). Already Adam Smith (1776, p. 741) pointed out that directors of a joint-stock corporation might oversee the firm's operations with less vigilance than partners in a private partnership.

One of the most controversial debates in the area of corporate governance centers on the question to which extent regulation (by governments, stock exchanges or other authorities) or individual corporations should determine the level of investor protection from abusive behavior of managers. The book of Berle and Means (1932) was probably the first empirical study influencing government regulation on corporate governance. Shortly after its publication, a series of laws regulating security markets and corporations were passed (e.g., the Securities Act of 1933, the Securities Exchange Act of 1934, and the Public Utility Holding Company Act of 1935), which influence U.S. corporate governance until today.[2] During the 1950s the opinion on the necessity of government intervention in corporate governance changed quite substantially, Alchian (1950), Friedman (1953), and Stigler (1958) argue that product market competition forces firms to minimize costs and therefore to adopt corporate governance mechanisms, in order to raise capital at lowest cost (see Shleifer and Vishny, 1997). The Alchian-Friedman-Stigler hypothesis (see Giroud and Mueller, 2009) predicts that in the long run competition will take care of corporate governance and therefore government interventions are unnecessary. In the 1960s the idea of the market for corporate control was introduced by Rostow (1959) and Manne (1964, 1965) as an effective mechanism of disciplining management (see Becht, Bolton, and Röell, 2005). In their view, hostile takeovers are a severe threat for managers and constitute a countervailing force against managerial discretion if ownership and control are separated.[3]

The discussion about the separation of ownership and control was revived by the paper of Jensen and Meckling (1976), where they propose a new theory of the ownership structure of the firm. Jensen and Meckling argue that the separation of ownership and control causes

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[2] It is hard to say with certainty to which extend the New Deal legislation of the Roosevelt administration was guided by the book of Berle and Means. The assessment of their contribution varies largely from being "the economic Bible of the Roosevelt administration" according to the *Time* magazine (Hessen, 1983) to "the book was at most a most minor influence on the formulation and passage of the securities acts" (Stigler and Friedland, 1983).

[3] Grossmann and Hart (1980) show that this mechanism may suffer from free-riding problems because small shareholders are better off if they keep their stock until the raider has replaced the inefficient management and improved the profitability of the target company.

agency costs, which depend on the ownership and capital structure of the firm, the bonding costs borne by managers, and the monitoring costs borne by investors. They argue that agency costs decline as management ownership increases because as the stake of managers rises they pay a larger share of these costs and therefore are less likely to pursue non-value maximizing objectives. Debt financing as substitute for outside equity is associated with lower agency costs but beyond a certain leverage the marginal agency costs of debt start to dominate the marginal costs of outside equity. The reason is that limited liability gives managers an incentive to gamble with creditors' money if leverage is high. Bonding and monitoring activities can reduce perk consumption and gambling by managers, but will generally not eliminate the problem of agency costs completely. In the view of Jensen and Meckling, the current form of corporations has survived despite its shortcomings, because of its superior attributes compared to potential alternatives.

The first who empirically examined the influence of the ownership structure on corporate performance were Demsetz and Lehn (1985). They find no significant relationship between ownership structure and accounting profits, which supports the view already formulated by Demsetz (1983) that the ownership structure of the firm is endogenously determined by a maximization process not only taking into account the problem of possible shareholder expropriation by managers. Demsetz and Lehn's paper sets the stage not only for a large number of subsequent papers investigating the effects of the separation of ownership and control but also on the much broader discussion of endogeneity issues in empirical corporate governance. After their study, a large number of authors investigated the question, whether management ownership influences firm performance and value. Morck, Shleifer and Vishny (1988a), for example, argue that there is a non-monotonic relationship between management ownership and

firm value.[4] They find that Tobin's Q (their measure of firm value) first increases, then decreases and finally increases again as ownership by board members rises. Morck et al. explain this finding with two countervailing effects: (1) the incentive effect, which leads to higher firm value if management ownership increases and (2) the entrenchment effect, which occurs at certain levels of management ownership, where managers are practically insulated from the market for corporate control or other monitoring mechanisms but only bear a relatively small part of the costs caused by their non-value-maximizing behavior. Already Morck et al. caution to interpret their results as evidence of a causal relationship running from management ownership to firm value.

Himmelberg, Hubbard, and Palia (1999) introduce new methods to the empirical discussion as they use panel data and instrumental variable techniques to detect the influence of management ownership on firm value (performance).[5] They find that managerial ownership is consistently explained by the contracting environment of firms and "cannot conclude (econometrically) that changes in managerial ownership affect firm performance" (Himmelberg et al., 1999). Their results are therefore consistent with the view of Demsetz and Lehn (1985) that firms choose management ownership optimally to minimize agency costs in the long run. Himmelberg et al. point out that there are two problems for the empirical analysis caused by the endogeneity of managerial ownership and firm value. First, it is quite likely that causality runs not from ownership to firm value but in opposite direction, which is known as reverse causality. The idea is that managers hold larger equity stakes in firms expected to be highly profitable in the future because thereby they can maximize their private wealth (Leland and Pyle, 1977). Second, it is also possible that both ownership and performance are determined by one or more unobserved variables in the firm's contracting environment, which could lead

[4] Other papers finding a significant (non-monotonic) relationship between management ownership and firm value are McConnell and Servaes (1990), Hermalin and Weisbach (1991), and Holderness, Kroszner, and Sheehan (1999).

[5] Demsetz and Villalonga (2001) provide an overview of the literature on managerial ownership and firm performance since the publication of Demsetz and Lehn (1985) until the paper of Himmelberg, Hubbard, and Palia (1999).

to spurious correlation. Himmelberg et al. give an example of a firm, which has for some historical reason superior market power compared to its competitors. This firm's management is therefore at least partly insulated from product market competition. As a consequence, the optimal contract for managers in this firm might call for more managerial equity ownership to better align interests of shareholders and management. The profitability of the firm with more market power is likely to be higher compared to its peers and therefore empirically a positive correlation between managerial ownership and firm performance would be measured. Besides the illustration of spurious correlation, this example also highlights another important issue of empirical corporate governance research: firm performance is most likely not only affected by managerial ownership but also other governance mechanisms. The example draws on the potentially disciplining effect of product market competition, which was already discussed above. Other mechanisms to control agency costs and thereby firm performance are ownership of institutions and large blockholders, composition of the board of directors, debt policy, the managerial labor market, and the already mentioned market for corporate control (see Agrawal and Knoeber, 1996). Since firms make simultaneous choices of individual mechanisms given their current institutional environment, it might not be sufficient to just estimate models, only taking into account one (or a few) of these interrelated governance mechanisms to derive causal relationships.

An emerging literature on corporate governance develops indices to evaluate the quality of a firm's governance (see, for example, Gompers, Ishii, and Metrick, 2003; Brown and Caylor, 2006). These indices are based on publicly available databases (e.g., IRRC, ISS) of firm-level corporate governance practices and usually just add up a large number of provisions, which are regarded as good or bad governance. This approach of course does not properly take into account any possible interrelation, complementarity or substitutability of governance mechanisms. Arcot and Bruno (2007) criticize this tick box approach as "one size fits all" frame-

work, which does not take into account that companies are not homogenous entities.[6] They provide empirical evidence that firms departing from governance best practice are not necessarily badly governed. It is particularly important to keep these results in mind when making policy recommendations, because it is not necessarily clear that additional regulation on transparency requirements, executive compensation or board composition increases the value of firms. Chhaochharia and Grinstein (2007), for example, find that the regulatory response (Sarbanes-Oxley Act) to the corporate scandals in the U.S. in 2001 and 2002 (e.g., Enron, WorldCom) were detrimental for many small corporations.

The problem becomes even more complex, when analyzing the effect of good corporate governance across countries, because institutional settings crucially affect individual firm's choices of governance mechanisms. Cross-country studies investigating the effect of governance practices on firm performance using broad corporate governance indices include Aggarwal, Erel, Stulz, and Williamson (2009), Bruno and Claessens (2007), Chhaochharia and Laeven (2009), and Doidge, Karolyi, and Stulz (2007).

Giroud and Mueller (2009) illustrate how individual governance mechanisms might influence each other by exploiting the exogenous event of the passage of business combination laws in different U.S. states to measure the effect of product market competition on firm performance.[7] Business combination laws were enacted to hinder corporate raiders from gaining access to the target's assets and therefore reduce the possibility of hostile takeovers. Giroud and Mueller find that this exogenous change in the effectiveness of the market for corporate control caused a significant decline in performance for firms operating in non-competitive indus-

[6] Bebchuk, Cohen, and Farrell (2009) criticize broad corporate governance indices, which try to include as many provisions as possible as "kitchen sink" approach. They suggest that only a small subset of governance provisions is of real significance and propose an entrenchment index, which is based on only six of the originally 24 provisions used by Gompers, Ishii, and Metrick (2003). They show that only these six provisions are associated with lower firm value, whereas the other 18 provisions are uncorrelated.

[7] Another example for interrelations between governance mechanisms is presented by Cremers and Nair (2005), who suggest that a complementarity between internal (e.g., shareholder activism) and external (e.g., market for corporate control) governance mechanisms exists. Only firms that are vulnerable to takeovers or have high institutional blockholder ownership exhibit superior performance.

tries, while it did not affect firms in competitive industries. They can actually identify a causal relationship because they use an augmented difference-in-difference approach, which carefully accounts for the endogeneity problem. Their analysis reveals that even if firms converge to a contractual optimum in the long run as implied by the results of Himmelberg et al. there still might be rather long periods of adjustment, probably caused by some fixed costs to change the corporate governance of firms.

3 Outline of the thesis

Chapter II analyzes the effects of bankers on supervisory boards of German non-financial corporations on firm policies and performance. The study suggests that bankers, while promoting their own business, actually cause a decline in the valuation of non-financial firms. Moreover, it provides evidence that the representation of bankers on supervisory boards has considerably reduced in recent years. One can interpret this adjustment of board composition as support for the hypothesis that firms slowly optimize their corporate governance after a formerly (presumably) efficient governance mechanism became inefficient. To address the obvious endogeneity problem between board composition and firm performance, the analysis takes advantage of the time dimension in the panel data set by using lagged explanatory variables and including the lagged dependent variable as an additional right-hand-side variable in the regressions. The lagged dependent variable filters out most of the effect of unobserved variables, because the dependent and the lagged dependent variable are affected in equal measure by this problem. This approach identifies causality in the sense of Granger (1969). Additionally also fixed effects are used to control for unobserved heterogeneity.

Chapter III analyzes, instead of one particular governance mechanism in detail for a large number of firms, the complete corporate governance arrangement of one firm. This chapter presents a clinical study examining the transformation of Preussag, a diversified German conglomerate of "old economy" businesses, into TUI, a company focused entirely on tourism and

logistics. By focusing on one firm this analysis allows identifying the causal relationship from ineffective corporate governance to poor firm performance. The analysis brings out an important point of the free cash flow theory (Jensen, 1986; 1993). The problem is not limited to managerial discretion over high operating cash flows, but extends also to managerial discretion over large amounts of liquid resources. Preussag's divestitures of "old economy" businesses created additional liquidity without sufficient incentives for management to use this liquidity efficiently. Instead, the CEO of Preussag (later TUI) was able to pursue his pet project, to build the largest European tourism company, without interference of any of company's watchdogs even after several billions in shareholder value were destroyed. This case illustrates that managers can act against the interest of shareholders for rather long periods, before efficiency is restored. The entrenchment of the CEO, stemming from its close personal ties to the largest shareholder of Preussag, seems to play the crucial role in explaining how he became the CEO with the longest tenure in a large listed German corporation. In particular, the analysis exemplifies that large blockholders, who themselves suffer from agency problems, not necessarily help to overcome the problems arising from the separation of ownership and control.

As just highlighted in the discussion of Chapter III, managerial entrenchment can considerably reduce the disciplining effect of governance mechanisms. If entrenchment insulates managers from the pressure to maximize shareholder value, it is important to understand which goals managers would pursue. The recent empirical literature on entrenched managers has found that managers will pay their workers more (Bertrand and Mullainathan, 1999; Cronqvist, Heyman, Nilsson, Svaleryd, and Vlachos, 2009) and in general prefer to avoid difficult decisions and costly efforts (Bertrand and Mullainathan, 1999; Giroud and Mueller, 2009). Therefore, the empirical evidence that average managers seem to enjoy the "quiet life" is in contrast to the prior literature on managerial preferences, which had assumed that managers prefer to maximize the amount of assets under their control (e.g., Baumol, 1959). Starting

from this observation, Chapter IV challenges the conventional view that value-destroying acquisitions are primarily undertaken by empire-building managers. This chapter provides evidence that quiet-life managers execute acquisitions to secure the independence of their firms and thereby private benefits of control. These presumably defensive acquisitions of quiet-life managers are associated with significantly negative bidder announcement returns and therefore offer a new explanation for the well-established empirical result that many acquisitions lead to the destruction of shareholder value for bidder companies.

In contrast to the preceding chapters, Chapter V deals with an issue actually caused by an incomplete separation of ownership and control. Since officers and directors of corporations are allowed to trade shares of their corporation, they are offered an opportunity to expropriate other shareholders. By virtue of their position, insiders obtain superior information about the economic situation of their firm, which they could potentially use to make trading profits at the expense of uninformed investors.[8] Kyle (1985) presents a model, where informed insiders can actually maximize their trading profits by camouflaging their information. The first to test this prediction empirically were Barclay and Warner (1993), who find evidence that most of a stock's cumulative price change occurs on medium-sized trades. This observation is consistent with informed traders splitting their trades in smaller transactions to conceal their information from outside investors before it is publicly announced. Medium-sized trades seem to provide an optimal trade-off between fixed costs of trading, time constraints and the objective to hide information. Barclay and Warner call this technique of splitting transactions stealth trading. However, their analysis and the subsequent literature based on their methodology only provide indirect evidence of stealth trading, because they cannot identify the behavior of individual traders.[9] The results presented in Chapter V provide direct evidence of stealth trad-

[8] Due to this obvious problem of asymmetric information between insiders and outside investors, regulators in most countries have now outlawed informed insider trading and disclosure requirements were considerably tightened over the last two decades (Bhattacharya and Daouk, 2002).

[9] See, for example, Chakravarty (2001), Chakravarty, Gulen, and Mayhew (2004), and Anand and Chakravarty (2007).

ing, by investigating the trading behavior of corporate insiders. However, there is only limited support for the hypothesis that insiders try to camouflage private information by using stealth trading. It rather seems that insiders just trade larger stakes than other investors and split transactions in order to reduce the temporary price impact of their trades, which compensates the market maker for providing liquidity.

Chapter II

Bankers on the Boards of German Firms: What they do, what they are worth, and why they are (still) there

1 Introduction

In this chapter, we document how German banks affect non-financial companies through board representation during the period from 1994 to 2005.[10] Our main result is that banks benefit from being present on the boards of non-financial firms: they increase their lending to these firms and to other firms in the same industry, and they are more likely to be chosen as an advisor if these firms undertake an acquisition. We also present evidence that banks help non-financial firms to overcome financing restrictions. By contrast, they do not act in the interest of equity holders – even if they themselves hold an equity stake. Overall, having a banker on the board is associated with lower performance, and we argue that the causality is likely to run from bank presence to low performance.

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[10] This chapter is based on joint work with Ingolf Dittmann and Ernst Maug, therefore I retain the personal pronoun "we", used in the original paper, throughout this chapter. An abridged version of this chapter is forthcoming in the *Review of Finance*. All tables are gathered at the end of the chapter. We are grateful to Rafel Crespi, Miguel A. García-Cestona, Abe de Jong, Jan Krahnen, Daniel Kreutzmann, Claudio Loderer, Ulrike Malmendier, Garen Markarian, Werner Neus, Jörg Rocholl, Günseli Tümer-Alkan, Yishay Yafeh, David Yermack, and seminar participants at Humboldt-University Berlin, the Campus for Finance Research conference, the University of Cologne, the ECGI Best Paper on Corporate Governance Competition conferences, the European School of Management and Technology, Universidad Autònoma de Barcelona, Helsinki School of Economics, the University of Konstanz, the Conference on Corporate Governance in Copenhagen, ENTER-Jamboree in Mannheim, the German Economic Association for Business Administration (GEABA) meetings, the Understanding Corporate Governance conference in Madrid, the conference of the TR/SFB 15 in Gummersbach, and the German Finance Association (DGF) meetings in Oestrich-Winkel for clarifying discussions and suggestions on earlier drafts of this paper. In addition, the paper greatly benefited from the comments of an anonymous referee and the co-editor Colin Mayer. We thank Christian Bassen and numerous research assistants in Berlin and Mannheim for excellent research assistance. We are also grateful to the Deutsche Bundesbank, in particular to Thilo Liebig, Ingrid Stein, and Natalja von Westernhagen for supporting us with access to their loan data. We gratefully acknowledge financial support from the collaborative research centres SFB 504 "Rationality Concepts, Decision Making and Economic Modeling" and TR/SFB 15 "Governance and the Efficiency of Economic Systems" at the University of Mannheim and from the Rudolph von Bennigsen-Foerder foundation. Christoph Schneider acknowledges the support of a DekaBank scholarship.

The relationship between banks and non-financial companies in Germany has been the subject of continuing debate in the literature. Earlier comparative analyses in the 1980s and before have focused more on the advantages of the German bank-based system compared to the Anglo-Saxon market-based financial system. Banks were credited with providing a long-term view on investment, providing expertise to companies as well as improved corporate governance.[11] Many of these commentators inferred that the growth performance of post-war Germany was directly related to the superiority of the German financial system, characterized by house banks, representation of banks on companies' supervisory boards, and the ability of banks to vote the shares of their customers. The more recent literature provides a less favorable perspective and emphasizes the lower quality of governance in civil law countries like Germany (La Porta et al., 1997).

In the intervening period, the gap between both systems has narrowed through institutional changes on both sides of the Atlantic. In Germany, legislators enacted a sequence of laws to enhance corporate governance by outlawing insider trading, increasing disclosure standards, and introducing a new regulator for financial markets. The most significant institutional change for our study was a change in capital gains taxation that became effective in 2002, which allowed banks to divest their equity holdings without paying capital gains taxes. This change in legislation substantially reduced the costs of selling equity stakes, particularly those stakes banks held for a long time and with an accordingly low tax base. Mostly because of this legal change, average equity ownership of banks in non-financial companies in Germany declined by a factor of 10, from 4.1% in 1994 to 0.4% in 2005. At the same time, the number of board seats held by bankers decreases only moderately from 9.6% to 5.6%. The number of boards

[11] See, for example, Mayer (1988). A good survey of these opinions as well as an early critique of these views is offered by Edwards and Fischer (1994), in particular in their chapter 1. Jensen (1989) argues that LBOs and similar going private transactions move the U.S. system towards the successful post-war Japanese system of corporate financing, which he also characterizes by close links between banks and non-financial companies.

where bankers are represented declined from 51% to 33% and seems to stabilize at around that value, which is also in line with findings for the U.S.

The increased disparity between equity ownership and board representation is puzzling and provides a backdrop against which we evaluate several hypotheses that explain the presence and effect of bankers on the boards of non-financial firms. We investigate three general hypotheses that have been developed in the literature to explain the presence of bankers on the boards of non-financial companies, in particular: (1) Bankers provide capital markets expertise and act as financial experts; (2) they monitor non-financial companies either because these companies are borrowers or because they hold an equity stake; (3) they promote their own business, either as commercial bankers (by increasing their lending to these firms or to other firms in the same industry) or as investment bankers (by selling more advisory services). We develop these hypotheses in more detail in the following section. Finally, we are also interested in the relationship between banks' board representation and firm value.

A major challenge for our study is to identify the direction of causality, because virtually all variables in our analysis are arguably endogenous. The negative relation between bank presence and performance, for instance, can be explained in three ways: (1) bankers cause low performance, (2) firms with low performance appoint bankers to their board, or (3) some additional variable (e.g., industry or corporate governance) affects performance and the attractiveness of board seats for bankers. To address the endogeneity problem, we take advantage of the time dimension in our panel data set, lag the explanatory variables in our regressions and include the lagged dependent variable as an additional right-hand-side variable. Hence, we only analyze the explanatory power of the independent variables *beyond* the explanatory power included in lagged values of the dependent variable itself. This identifies causality in the sense of Granger (1969). We also use fixed effects to control for unobserved heterogeneity.

Our analysis is based on a unique, hand-collected panel data set for all firms that were among the largest 100 listed companies in Germany for any year in our sample period from 1994 to 2005. This provides us with a data set for 137 non-financial firms and 11 banks. We also use data from *Deutsche Bundesbank,* which contains the total amount of loans that is provided by a given bank to a given firm. We find strong evidence that bankers on the board of German non-financial firms promote their own business: Banks lend more to the firms on whose boards they are represented, and some evidence that they also lend more to other firms in the same industry. We also find compelling evidence that bankers use board seats to promote their investment banking business, because the presence of bankers on the board is strongly correlated with firms' subsequent choices of their M&A advisors. We also find substantial evidence that bankers are capital market experts who help companies to acquire external finance more easily or to fund capital expenditures. By contrast, we do not find any evidence (and sometimes even contradicting evidence) to support the notion that bankers on the board act as monitors. They do not act in their interests as equity-holders, a role that largely disappears during our sample period. Neither do they seem to protect their interests as lenders.

Finally, we investigate the relation between bank representation and firm value and find that this is consistently negative. We establish that performance deteriorates *after* bankers have been appointed to the board, which suggests that bankers cause low performance.[12] We conclude that the board relationships between banks and non-financial firms are beneficial for the banks, while they are potentially harmful for non-financial firms. Our results suggest that German universal banks do not behave much differently from U.S. specialist banks: Their role as a shareholder in non-financial firms has disappeared and they are mainly interested in pro-

[12] Alternatively, bankers may assume board seats in those companies where they *expect* performance to deteriorate. We regard it as unlikely that bankers consistently accept board appointments *before* performance deteriorates, but never *after* performance deteriorates.

moting their lending and investment banking business.[13] As a result, the German financial system has lost some of its formerly distinctive features.

The argument proceeds as follows. We provide a literature review and develop our hypotheses in Section 2. Section 3 describes the main features of the relevant institutional framework, the construction of our data set, and the methods we use. Section 4 discusses the factors that influence the presence of bankers on the supervisory boards of non-financial firms. Section 5 asks what role bankers actually perform on the boards, and Section 6 addresses the question whether firms benefit from having a banker on their board. Section 7 integrates our findings and relates them to the hypotheses developed in Section 2. Section 8 concludes.

2 Literature review and hypothesis development

Several mutually non-exclusive hypotheses regarding bank representation have been advanced in the literature (see Kroszner and Strahan (2001), and Byrd and Mizruchi (2005)). We develop these hypotheses here in detail. In all cases, we distinguish between three questions. First, we want to understand the motivations of banks to seek board representation in non-financial companies. Second, once bankers are represented on the board we want to understand the impact they have on financing and investment decisions. These two questions are clearly linked, but bankers may or may not pursue the agenda they were meant to pursue when they were elected to the board. Finally, we are interested in the link between bank representation on the board and firm value.

2.1 Bankers provide capital markets expertise

The **capital markets expertise** hypothesis emphasizes the demand side and therefore the characteristics of companies that actively seek bank representation on their boards. According to this hypothesis, bankers are appointed to the boards of non-financial companies as financial

[13] Similar results have been found for the U.S. by Byrd and Mizruchi (2005) and Güner, Malmendier and Tate (2008). In contrast, Jagannathan and Krishnamurthy (2004) show that investment bankers on the board have a positive effect on firm value in the U.S.

experts who help the company to obtain funding. Bankers on the board overcome adverse selection and credit rationing problems so that companies that have a banker on their board should use more bank lending and increase their leverage.[14] The company should then be financially less constrained and investment decisions of firms with a banker on the board should be responsive only to their own investment opportunities. If bankers are experts at pricing debt, then companies that rely more on debt financing should also include more bankers on the board (Booth and Deli, 1999). In terms of consequences for financial policy, increases in leverage should then be accompanied by higher capital expenditure and capital expenditure should be higher for firms with a banker after controlling for investment opportunities. The effect on firm value of a relaxation of financing constraints is unclear, however. The effect is positive if the reduced constraints allow the firm to invest in positive net present value projects, which it would not have been able to finance otherwise. On the other hand, relaxed financing constraints might also allow managers to overinvest or to waste resources.

2.2 Bankers monitor non-financial firms

Our remaining hypotheses emphasize the supply side and the motivations of bankers to seek representation on the boards of certain companies. There are two general motivations: monitoring of the bank's investments, and the promotion of the bank's own business. Depending on the type of investment, there are two variants of the monitoring hypothesis. First, according to the **equity monitoring** hypothesis, bankers on boards simply represent their interests as shareholders, just as any other block owner may do. If this is correct, then we should see that bank representation is closely associated with bank ownership of shares, and that they engage more in underperforming companies with lower valuations, as these companies seem to indicate a stronger need for intervention by the owners. Hence, we should see a negative associa-

[14] Ramirez (1995), Byrd and Mizruchi (2005), and Ciamarra (2006) provide evidence for the capital markets expertise hypothesis for U.S. firms. Morck and Nakamura (1999) provide supporting evidence for Japan. Byrd and Mizruchi (2005) list a number of sources that develop the capital markets expertise hypothesis (pp. 229-30).

tion between the appointment of a banker and Tobin's Q.[15] Berger, Ofek, and Yermack (1997) argue that entrenched managers tend to have less leverage and that a better representation of the interest of owners should therefore increase leverage. According to this view, bankers should increase leverage and if they increase leverage primarily in pursuit of their equity interests, then this increase in leverage should be spread across different sources of borrowing. Similarly, banks as equity investors should press for higher payouts of free cash flows to shareholders, just as much as any other blockholder would. As a consequence, we should observe improving performance and higher valuations for firms with bank representation on the board.

The second variant of the monitoring hypothesis, the **debt monitoring** hypothesis holds that bankers wish to safeguard their existing loans and want to get involved in those companies where their loans have a significant probability to be distressed in the future.[16] Then bank representation on the board allows bankers to influence financial and investment policies to protect the interests of the firm's existing creditors and becomes a substitute for loan covenants. In this scenario, we should see more bankers on the boards of companies that are riskier and have a higher likelihood of entering financial distress, fewer collateralizable assets, and higher leverage, in particular through loans from the bank represented on the board. If bankers represent the interests of lenders, we should expect a lower payout ratio and a decline in the firm's risk. The implications for the value of the firm are ambiguous. Debt monitoring may reduce adverse selection costs and therefore the costs of capital, which increases the value of the firm. However, steering the investment policy of the firm towards lower risk investments and lower payouts may reduce firm value.

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[15] Kaplan and Minton (1994) and Morck and Nakamura (1999) argue for the case of Japan that poor stock performance increases the likelihood of bankers being appointed to the boards of non-financial companies.

[16] See Fama (1985) and James (1987). Morck and Nakamura (1999) show that bankers on the boards of Japanese firms primarily act in the interest of creditors.

2.3 Bankers promote their own business

The German proxy voting rules allow banks to vote the shares of their depositors. Since large fractions of the shares of German companies are deposited with the large banks, this permits banks to elect their own managers to corporate boards independently of their own equity stakes. As a result, banks may use board representation in order to promote their own business. We distinguish between three sub-hypotheses. First, bankers might seek board seats in order to sell debt to the firm (**debt selling** hypothesis).[17] In particular, they may wish to better screen loan applications and to obtain inside information on the financial status of (potential) borrowers. We would then expect that bankers seek representation on the boards of firms with large, unutilized debt capacity, i.e., firms with a large proportion of tangible assets, low volatility, and low existing leverage. In contrast to the equity monitoring hypothesis, this argument does not imply that bankers on the board cause higher overall leverage. It only implies more lending from the bank represented on the board. Borrowing across all sources of funding may even be reduced if borrowing from the bank represented on the board displaces borrowing from other sources.[18] If bankers on the board represent the interests of their employer in this way then the firm will most likely borrow too much and at less advantageous terms, which should lead to a reduction in firm value.

A closely related argument, the **industry expertise** hypothesis states that bankers may derive industry knowledge from their board seats, which then allows them to condition their lending decisions to firms in that industry more accurately. For example, banks may be willing to advance credit lines to companies only if they learn sufficiently quickly if lending conditions in the industry deteriorate, so that they can make timely decisions to call back these credit lines.

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[17] Booth and Deli (1999) find that the presence of commercial bankers on the boards of U.S. companies is associated with higher aggregate debt levels.

[18] Daniševská, de Jong, and Verbeek (2004) argue that banks use their influence to increase lending but reduce overall leverage to maximize the value of their own loans. Byrd and Mizruchi (2005) show that U.S. commercial bankers who are also lenders to the firm have a negative effect on the debt ratio. In contrast, Booth and Deli (1999) find that the presence of commercial bankers on the boards of U.S. companies is associated with higher aggregate debt levels.

This hypothesis implies that a bank's representation on the boards within an industry is positively related to future lending of this bank to firms in this industry. To the best of our knowledge, this hypothesis has not been formulated or tested in the literature before. [19]

Finally, banks may also sell other services to their clients and we label this hypothesis **selling M&A advisory services** (e.g., Güner, Malmendier, and Tate, 2008). The firms in our sample are large and undertake mergers and acquisitions on a regular basis to complement their operations. Some of the banks represented on the boards of these firms also own investment-banking divisions, which typically contribute significantly to the overall profitability of universal banks in Germany. We therefore expect that bankers on boards channel the high margin M&A advisory business towards their own employer. We do not expect this to have a major implication for valuation, unless mergers and acquisitions account for a large fraction of a company's economic activity.

2.4 Evidence from other studies

The literature has also discussed the conflicts of interest hypothesis, which says that bankers are more likely to seek representation on boards where they do not jeopardize their position as lenders (e.g., Kroszner and Strahan, 2001). In our view, this hypothesis depends on the validity of the doctrine of "lender liability" and is therefore specific to institutional contexts such as those of the United States, where banks with board representation may be held accountable and lose the priority of their debt claims in case of bankruptcy. German law has no such provisions, so this hypothesis does not apply.[20]

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[19] Mintz and Schwartz (1985) observe that banks in the U.S. seek board seats on other firms much more than non-financial companies and argue that the main function of these board representations is to provide the banks with sufficient intelligence about the lending conditions in the economy. However, they do not analyze any industry relationships and the later literature has not picked up their suggestion. Kroszner and Strahan (2001) argue that banks learn through their lending relationships and then use this knowledge in the companies where they sit on the board.

[20] Banks may be held liable for interventions in a company if they obtain the right to do so after a breach of covenants by a creditor, but this is different from our context where banks represent their interests on the board of directors.

Numerous studies have analyzed aspects of the relationship between German banks and German non-financial companies. In particular Cable (1985), Gorton and Schmid (2000), Edwards and Nibler (2000), and Lehmann and Weigand (2000) reach more benign conclusions regarding the role of banks in German corporate governance than our study. To the best of our knowledge, Cable (1985) is the earliest paper in this literature. He studies a 1970 sample of 48 German firms and finds that bank control enhances profitability. He does not analyze causality, relies on a small and much earlier sample, and uses a somewhat idiosyncratic measure of profitability. Gorton and Schmid (2000) study the effects of bank equity control on German firms for two cross-sections and find that bank equity ownership is beneficial and that banks appear to be special compared to other shareholders in that they positively affect firm performance. However, unlike our study they do not analyze a panel and do not include the influence through board membership in their study. Also, as their study finds a significant structural break between their 1975 and their 1986 cross-section, it is plausible to presume that some of the relationships they describe have changed until 1994, when our sample starts. Lehmann and Weigand (2000) reach a similar conclusion to Gorton and Schmid, but they use a very different research design. Their sample covers the early 1990s and therefore overlaps with our sample, but is restricted to mining and manufacturing industries and includes smaller and also unlisted firms. Their results are therefore not directly comparable to ours. Edwards and Nibler (2000) investigate a cross-section of 156 of the largest non-financial German firms and find a positive impact of the equity ownership of the top three banks, but they undertake neither causality analysis nor control for unobserved heterogeneity and several other effects we include in our model. Boehmer (2000) studies a sample of acquisitions and finds that banks only provide benefits to bidding companies when their power is offset by non-bank blockholders, which is closer to our findings in a different context. Franks and Mayer's (1998) clinical study of all three hostile takeover attempts in post-war Germany also finds evidence that banks do not always act in the interests of shareholders. Elston and Goldberg

(2003) show that bank influence reduces the level of compensation for German executives. Agarwal and Elston (2001) also strike a cautious note on the beneficial impact of German banks and find that bank influence does not seem to enhance either firms' profitability or growth, which is also corroborated by a later study by Chirinko and Elston (2006).

3 Institutional framework, data and methods

3.1 Institutional framework

The German board system has some distinct characteristics that differentiate it from the systems of most other countries, notably the Anglo-Saxon model.[21] German companies have a two-tier board, where the management board (*Vorstand*) is responsible for the day-to-day operations and the supervisory board (*Aufsichtsrat*) appoints and supervises the members of the management board on behalf of shareholders and the public interest. This structure has been mandatory since 1870. Most aspects of the board structure are tightly regulated by the German stock corporation act (*Aktiengesetz*) and other laws, which leave little discretion to the company and its charter. In particular, the two boards are personally separated, and nobody can be a member of both boards of the same company at the same time. Also, direct board interlocks are prohibited so that a member of the management board of company A cannot sit on the supervisory board of company B if a management board member of company B is sitting on the supervisory board of company A at the same time. Nobody is allowed to accumulate more than ten seats on the supervisory boards of different corporations, where a chairmanship counts as two board seats for the benefits of this regulation.[22]

Under applicable German law, in particular the co-determination act (*Mitbestimmungsgesetz*) the supervisory board has a minimum and a maximum size, which depends on the number of

[21] More detailed accounts of the German board system can be found in Charkham (1994), Edwards and Fischer (1994), Hopt (1998), and Prigge (1998).

[22] Management board members of holding companies and parent corporations often represent the interests of the parent by holding supervisory board seats on the boards of their subsidiaries. Up to five seats in subsidiaries are not counted towards the seat limit. Chairmanships have counted as two seats towards the limit of 10 seats on the supervisory board only since May 1998.

employees of the firm, so board size is largely determined by law. We therefore do not use this variable in our empirical analysis. The codetermination act also requires that half of all board members are worker representatives.[23] Still, the shareholders of the company retain control of the supervisory board because the chairman of the supervisory board, who has the casting vote in case of a tie, is appointed by shareholders. The worker representatives are elected by the company's workers, and some of them must be union representatives. The shareholders' representatives on the supervisory board are elected by the shareholders' annual general meeting. The supervisory board cannot assume managerial responsibilities, but the company's charter can require that some executive decisions be subject to the supervisory board's approval.

In January 2002, a capital gains tax reform became effective that was first proposed by the federal government in December 1999 and that was formally (and rather unexpectedly) finalized by a vote of the upper house (Bundesrat) in July 2000. Realized capital gains from the sales of shares in companies were taxable before January 2002 and have been tax-free since then. Hence, the reform provided incentives to realize book losses before January 2002 and to delay the realization of gains until after January 1, 2002. The taxation of capital gains was widely perceived as an obstacle to the unraveling of cross shareholdings between German companies.

Another important development during our sample period is the internationalization of the German stock market. More and more German companies switched their financial reporting from German GAAP to IFRS or U.S. GAAP. While in 1994 all firms in our data set reported according to German GAAP, this number falls to 2% in 2005. As German GAAP is more conservative than IFRS or U.S. GAAP (see Harris, Lang, and Möller, 1994), we include a German GAAP dummy variable in all regressions where the dependent variable is likely to be

[23] The co-determination act does not apply to smaller companies with less than 2,000 employees, where the required proportion of worker representatives is only one third. For 72% of our non-bank firm-year observations, the number of employees exceeds 2,000.

affected by the accounting standard. In addition, we repeat all regressions that include accounting variables (as dependent or independent variables) for the smaller sample of all firm-year observations with German GAAP reporting. In order to conserve space, we do not show these robustness checks in the tables, but we report whenever they yield qualitatively different results.

3.2 Construction of the data set

We identify all companies that were included in the DAX 100, the index of the top 100 listed German companies, at any point in time during the 12-year period from 1994 to 2005. These are 167 firms, which we divide into two subsamples. The first subsample comprises 11 banks (SIC code 6021) and the second subsample comprises 137 non-banks. Financial services companies (SIC codes between 6000 and 6999) other than banks are excluded from both samples. For all these companies we obtain the following data from *Worldscope*, *SDC Platinum*, *Datastream*, *Deutsche Bundesbank* and *Hoppenstedt company profiles* for the years 1994-2005.[24] *Hoppenstedt company profiles* (a periodical similar to Moody's manuals) gives us the names of all members of the management board and the supervisory board. From *Hoppenstedt company profiles,* we also obtain information about blockholders, and the total payments to members of the management board. In those cases where *Hoppenstedt* does not provide certain data, we compiled it from other sources, usually from company reports, which was successful in most cases. We obtain accounting data from *Worldscope* and market data from *Datastream*. From *SDC Platinum* we obtain data on mergers and acquisitions of our sample firms and the identity of the acquiring firm's advisor. *Deutsche Bundesbank* provided us with data for individual bank-firm credit relationships, which they collect according to Section 14 of the German Banking Act (*Kreditwesengesetz*).[25] Our final sample consists of 1,388

[24] See http://www.hoppenstedt.de/ for further information on the Hoppenstedt group and their company profiles (*Firmen-Profile*).

[25] According to Section 14 of the German Banking Act (*Kreditwesengesetz*), German banks have to report on a quarterly basis all creditors whose total borrowing volume from the bank exceeds €1.5m. The total credit

firm-year observations on non-financial firms and a further 110 firm-year observations for banks.

Insert Table 2.1 and Table 2.2 here.

Table 2.1 provides the definitions of all our variables at the firm-year level and reports their respective sources. Table 2.2 presents summary statistics for the sample of non-financial firms.

3.3 Ties between banks and non-financial firms

In order to measure bank influence we need to define a "banker," which poses some difficulties.[26] It is common practice in Germany that former bank managers become members of their company's supervisory board immediately after their retirement, when a younger colleague takes over the top management post. In our view, these retired supervisory board members still represent the interests of their former employers. We therefore define that a person is a "banker" for all years after he or she joined the management board of a bank. She stays a "banker" except if she is appointed to a non-bank's management board during the sample-period. Then we define her status as a "non-banker" from that point onwards.

We measure bank influence on a company by two variables. The first is defined as *Bank-Dummy* and assumes a value of one if at least one member of the supervisory board is a banker, and zero otherwise. In 643 firm-years, or 46% of our sample, at least one member of the supervisory board was a banker. The second variable to measure the influence of banks is

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volume also includes bonds issued by the creditor and held by the bank. The aim of this regulation is to track the financial liabilities of a firm, so a bank loan for which two firms are liable (e.g., because it is given to a joint venture of the two firms) appears twice in the database. While this double counting is a serious limitation of this database in general, it is less important in our case, because we are explicitly interested in all borrowing relationships a firm has to one of our sample banks. Also, the restriction of the database to borrowing in excess of €1.5m should not result in a substantial bias as we consider only large firms. We match the Bundesbank and Worldscope data manually based on the names of the firms and banks.

[26] Note that unlike the U.S. literature on the influence of bankers on boards we do not distinguish between commercial bankers and investment bankers. Such a distinction is impossible in the German context as investment banking services and commercial banking services are offered by the same universal banks. See Booth and Deli (1999), Kroszner and Strahan (2001), Jagannathan and Krishnamurthy (2004), and Güner, Malmendier, and Tate (2008).

PercentBankers defined as the ratio of bankers to the total number of shareholder representatives on the supervisory board. We focus only on shareholder representatives on the supervisory board and disregard worker representatives for our purposes. On average, bankers occupy 8.8% of all shareholder appointed supervisory board seats, and the median supervisory board in our sample has six shareholder representatives (the mean is 7.1).

The average equity ownership of German banks, *BankEquity*, is only 3.3% during this period, again much reduced compared to the 7.3% reported for the earlier sample by Edwards and Fischer (1994).[27] The distribution of equity stakes is highly skewed: For only 18% of all our firm-year observations, *BankEquity* is positive and then it is 18.3% on average with a median of 13.2%. So, banks hold substantial stakes in a few companies rather than small stakes in all of them.

Insert Table 2.3 here.

The aggregate figures above suggest a substantial loosening of the ties between banks and non-banks between the 1970s and the 1990s. We investigate this further in Table 2.3, which reports the means of some of the major variables from our data set by year for the subset of companies where we have continuous data from 1994 to 2005. This allows us to assess the impact of the institutional changes during this period, in particular the reform of corporate taxes that became effective at the beginning of 2002. Table 2.3 shows that the equity ownership of banks in non-financial firms (*BankEquity*) is stable around 4% from 1994 to 2001 and then drops to 0.4% by 2005, which reflects a substantial reduction in the number of firms where banks hold equity as well as in the average size of the remaining equity stakes.[28] This suggests that banks held shares during the earlier sample period mainly in order to defer taxes

[27] Gorton and Schmid (2000) use a similar sample to Edwards and Fischer (1994) of 82 firms and report equity ownership to be 8%. They also collect data for another 56 firms for 1986 and report equity ownership to be 13% there.

[28] The numbers in Table 2.2 and Table 2.3 are not directly comparable because Table 2.3 is based on a subsample of 75 firms for which we have continuous data from 1994-2005. Of these firms, 16 have bank equity investments in 1994, of which three remain in 2005. The average size of a stake declines from 19.4% to 9.3% during this period.

and not for other economic reasons. We therefore expect that theories trying to explain bank shareholdings in non-financial companies will find little support during this period. Ownership of other blockholders (*NonBankEquity*) also declines from 55.4% in 1994 to 47.7%, but the decline is more gradual here and relatively moderate compared to the decline of bank equity ownership. This is also reflected in the increase of the free float from 40.5% to 51.9%, which suggests that the attempts to improve financial market regulation where met with some success, at least in terms of the attractiveness of German capital markets for small shareholders.

The representation of bankers on boards has declined dramatically over the 1994 to 2005 period according to both measures, *BankDummy* and *PercentBankers*. At the beginning of this period, 50.7% of all supervisory boards included a banker compared to only 33.3% twelve years later, and the percentage of bankers on boards fell from 9.6% to 5.6% over this period. These figures are substantially below the 75% of the top 100 German firms who had a banker on their supervisory board in 1974, when bankers held 22.4% of the shareholder seats in a comparable sample of companies (Edwards and Fisher, 1994, p. 201). By comparison, in the U.S. only about 31.6% of large firms had representatives of banks (commercial or investment banks) on their boards.[29] We interpret this development as part of the continuing unraveling of what used to be the distinctly German pattern of corporate governance and bank-firm relationships and as support of the notion that the German model converges to the Anglo-Saxon model. However, the decline in bank representation on boards is not nearly as stark as the decline in banks' equity ownership. Most of the change in board representation happened between 2002 and 2004. Board representation stabilized at 31% in 2004 and 2005 in the full sample (not shown in the table), which suggests that the weaker decline in board representation is not due to a mere time lag. In addition, Table 2.2 shows that bankers on the board

[29] See Kroszner and Strahan (2001), referring to the Forbes 500 firms in 1992. Similar numbers have been reported by Byrd and Mizruchi (2005) and Güner, Malmendier, and Tate (2008).

without equity stakes outnumber bankers who represent an equity stake by three to one (compare the means of *PercentBankersWithEquity* and *PercentBankersWithoutEquity*). Hence, board representation and equity ownership are not closely related.

We do not have data on the proxy voting rights of banks. These voting rights are a specific part of German corporate governance that allows banks to vote the shares of their customers at shareholder meetings. Data on these voting rights are very expensive to collect because the only source are the minutes of the shareholder meetings, which must be filed with the local district court where the company is registered. Previous studies have therefore always collected only small samples of proxy voting data, and no study has ever compiled a panel.[30] The figures in these studies are not directly comparable, but they agree on the fact that banks' voting power derives to a large extent from their proxy voting rights, and only a small proportion of voting rights derives from direct equity ownership.

3.4 Performance measures and additional variables

Our measure of company valuation is Tobin's Q, which we define as the market value of the firm divided by the book value of total assets.[31] The market value of the firm is calculated as the book value of total assets minus the book value of equity plus the market value of equity. Clearly, this is only an approximation to Tobin's Q. We have sufficient balance sheet data for 1,282 firm-years or 92% of our sample and the average Q is 1.54 (the median is 1.24, see Table 2.2). Other variables we use to describe companies' performance are the return on assets (defined as EBIT divided by total assets) and sales growth. The median company has sales of almost €1.9bn, which shows that our sample consists of large companies.

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30 Edwards and Fischer (1994) report that banks vote 49.45% of the shares of companies in their sample by proxy. Gorton and Schmid (2000) have 21% for their 1975 sample and 23% for their 1986 sample. Elsas and Krahnen (2004) report an average of 29.5% for a 1990 sample of 65 large firms.

31 Tobin's Q has been widely used as a performance measure in the corporate governance literature. Research that focuses on boards and uses Tobin's Q or the market to book ratio includes Pfannschmidt (1995), Yermack (1996), Edwards and Weichenrieder (2004), Gorton and Schmid (2000), de Jong (2002), Loderer and Peyer (2002), and Fich and Shivdasani (2006).

Data on executive compensation are notoriously scant in Germany and we have no data on these variables before 1997. Executive compensation has to be disclosed individually for members of the management board only since 2006. Therefore, we can only compute the average compensation per board member for our sample period. Table 2.3 shows that management compensation increases steadily and more than doubles during the nine years for which we have data. However, compensation divided by firm value declines by 5% from 1997 to 2005.

In our analysis, we also look at – and control for – firms' funding decisions as proxied by capital expenditure (scaled by total assets) and the payout ratio, which is the percentage of net income paid out to shareholders. In addition to market leverage and book leverage, we use a third measure of leverage: *LeverageBanks* is the ratio of *BankDebt* to the sum of total debt and market capitalization and measures the part of market leverage that is provided by the banks in our sample. Due to the double counting problem discussed in Footnote 25, *BankDebt* can be overstated and in a few cases it can be even higher than total debt.[32] This is the reason why the maximum of *LeverageBanks* is bigger than the maximum of *LeverageMarket* in Table 2.2. Apart from this, the numbers are very reasonable: average book leverage is 38%, average market leverage is 27%, and average bank leverage is 15%. Finally, we also include three variables that proxy for the debt capacity of the firm: interest cover, defined as the ratio of EBIT to interest expense, the amount of intangible assets scaled by total assets, and the firm's stock price volatility.

We use dummy variables for calendar years and for industries. Our industry definition uses the definition of prime sectors of the German stock exchange, and we aggregate some sectors with a small number of firm-years in our sample to obtain 15 different industries.[33]

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[32] This bias is likely to affect only the level of *LeverageBanks*, but not the covariation of *LeverageBanks* with bank representation, which is the focus of our study.

[33] We consolidate media, telecommunications, and transport with consumer, and software with technology. This leaves us with 12 non-financial industries (automobiles, basic resources, chemicals, construction, con-

3.5 Methods

Endogeneity is a major problem in our analysis, because firm value, bank involvement, and firm policies are likely to be jointly determined. Some of our hypotheses imply that firm value increases (or decreases) if banks get involved, while other hypotheses state that low-value firms actively solicit bank involvement. Similarly, some hypotheses predict that certain firm policies (like leverage or capital expenditure) should affect the board representation of bankers while other hypotheses imply the opposite direction of causality. We address the endogeneity problem in three ways but are aware of the fact that they can only alleviate but not completely solve the problem.

First, all our explanatory variables are lagged by one year in order to remove the contemporaneous effect if the explanatory variable is endogenous. Many variables in our analysis (including banks' board representation) are highly correlated over time, so that this method is only of limited use here. Second, we include fixed effects that filter out year, industry, or firm effects and thereby any unobserved heterogeneity that is constant over time.

Third, we also include specifications with the lagged dependent variable as an additional right hand side variable:

$$y_{it} = \alpha + \beta y_{it-1} + \sum_k \gamma_k x^k_{it-1} + \varepsilon_{it} \ . \qquad (2\text{-}1)$$

This specification is a generalization of differencing the dependent variable, because β is not restricted to be equal to one. Formally, specification (2-1) is a Granger (1969) causality regression, which asks whether the lagged independent variables x^k have explanatory power for the dependent variable y beyond the explanatory power included in lagged values of y itself. The lagged dependent variable filters out most of the effect of missing variables, which will affect y_t and y_{t-1} in equal measure. The main advantage of this approach is that we can include

sumer, food, healthcare, industrial, machinery, retail, technology, utilities) and three financial industries (banks, finance, insurance). We need to consolidate industries in order to reduce the potential bias that is caused by the use of fixed (industry) effects in Tobit or Granger causality regressions.

the lags of endogenous variables because they are predetermined and need not distinguish them from exogenous variables.

Granger causality regressions are a very conservative method, because they remove much of the cross-sectional variation whenever the dependent variable changes only slowly over time. We therefore always also report OLS regressions with firm fixed effects and OLS or Tobit regressions with industry effects. While these fixed effects regressions do not help much to identify the direction of causality, they provide a more complete picture about the association between the dependent and the explanatory variables.

Granger causality has a few drawbacks. Jacobs, Leamer, and Ward (1979) show that Granger causality is not able to detect the *absence* of causality, but that it can be used to prove the *existence* of causality – given that the model is correctly specified. We check for correct specification in our analysis in two ways. First, we re-run all Granger causality regressions (2-1) with three lags $y_{it\text{-}1}$, …, $y_{it\text{-}3}$; we do not show the results in the tables but report all qualitative changes relative to the tables shown. Typically, we observe an increase in the standard errors because we lose an additional 20% of our observations by including more lags. Second, we perform a unit-root test for all our dependent variables and find that we can reject the hypothesis of a unit-root for all of them (not shown in the tables; see He and Maekawa (2001) for a discussion of spurious Granger causality for integrated processes). Another problem occurs if one of the variables involves forward-looking behavior. Suppose that higher *PercentBankers* reduces firm value. As Tobin's Q involves market expectations, this variable will react immediately to any changes in *PercentBankers*, and the reaction will possibly even precede the cause if such a change is anticipated. Then it is possible that the test picks up a Granger causality from Tobin's Q to *PercentBankers* even though the true causality runs in the opposite direction. We therefore need to be cautious when interpreting the Granger causality regressions.

Other methods that are often used to tackle endogeneity in the literature do not work in our setting. The most obvious choice is instrumental variables regressions, but these regressions are only as good as the instruments used and all the variables in our analysis can be easily argued to be endogenous. We experimented with firm age and the distance of a firm's headquarters to Frankfurt, where most banks are based, but age seems to proxy for many unobserved factors and distance turns out to be a weak instrument. We also tried to take advantage of the tax law change in a differences-in-differences approach, but this change has a direct effect only on banks' equity holdings but not on their representation on the supervisory board.

An obvious way to measure the impact of bankers on firm value is an event study of the effect of adding a banker to the board. We also followed this approach, but it did not yield any robust results because the appointment of a new banker is not a major news event. In most cases, the proposed new appointments are listed in the proxy statement, which usually includes a lot of further contaminating news. If a director must be replaced between two annual general meetings, the firm proposes a new director to the local court, and the court then checks a number of formal criteria. In the few cases where there are press announcements, these are dated from after the court's decision, and it appears unreasonable to assume that the market did not learn about the pending appointment earlier.

In order to conserve space, we concentrate on *PercentBankers* as a measure of bank board activity in our analysis below. As a robustness check, we repeat the whole analysis with *BankDummy* and find very similar results. We therefore only report them in the few cases when they are qualitatively different from the results for *PercentBankers*.

4 When do banks get involved?

We first address the question when banks are represented on the supervisory boards of non-financial German firms, so our dependent variable in Table 2.4 is the percentage of bankers on the firm's supervisory board. In Panel A, we consider the full sample from 1994 to 2005.

Here we run a Tobit regression with year and industry dummies (models (1) and (2)) and an OLS regression with year and firm dummies (models (3) and (4)). Using a Tobit model here is appropriate because about half of the observations are censored at zero. However, Tobit models with firm fixed effects are biased and inconsistent when the time dimension is small, so we use OLS in the specifications with firm fixed effects. The table also shows two Tobit regressions with the lagged dependent variable as additional explanatory variable (models (5) and (6)). Panel B contains the results of the three regressions with *LeverageBanks* for the two subsamples 1994-1999 and 2000-2005.

Insert Table 2.4 here.

Our analysis in Table 2.4 (Panel A) yields some evidence for the **capital markets expertise hypothesis.** This hypothesis implies that companies that rely more on debt and that have higher funding requirements try to attract more bankers to their boards. If we assume that faster growing companies are also those with larger funding needs, then the positive and significant coefficient on *SalesGrowth* in specifications (3) to (6) can be explained by fast growing companies attempting to recruit directors to their boards who help them to reduce the costs of external financing.[34] Predictions for Tobin's Q are ambiguous. Higher values for Tobin's Q may reflect that firms have more growth options and therefore more need for external capital, so that we would expect a positive coefficient on Tobin's Q under the capital markets expertise hypothesis. However, low values for Tobin's Q may also identify low performance firms that are more in need of external expertise, which would suggest a negative coefficient. Our coefficient estimates are not consistent across specifications and can therefore not lend support to either interpretation. To the extent that funding requirements are related to (past) capital expenditure, we should also see a positive relationship between *CapEx* and *PercentBankers*, but we find significant results here only for specifications (3) and (4) with firm

[34] In our robustness checks (not reported in the tables), *LogSales* is insignificant in the Granger causality regressions (5) and (6) if *BankDummy* is used instead of *PercentBankers*.

fixed effects. If the expertise on negotiating and pricing debt contracts is important, then we should see more bankers on the boards of more highly levered firms, but the coefficient on *LeverageMarket* is never significant.[35] Overall, we find limited evidence that is consistent with the capital markets expertise hypothesis.

We also find some evidence for the **debt selling hypothesis,** which implies that bankers seek representation on the boards of companies that have large underutilized debt capacity. According to this hypothesis, bank representation should be higher for large, low-risk companies that have a large proportion of tangible assets. We find that size as measured by sales has a highly significant positive impact on bank representation on the board in all specifications. Also, the negative relationships between *Volatility* and *PercentBankers*, which is significant in the two firm fixed effects regressions, is consistent with the debt selling hypothesis. The proportion of intangible assets is insignificant in all specifications. The significant positive effect of *LeverageBanks* on *PercentBankers* in two of the three specifications in Table 2.4A is not conclusive because it is not clear whether bankers can leave after they have successfully sold their loans or if they must stay in order to make sure that their bank maintains its position if the debt matures and must be rolled over.[36] Hence, some predictions of the debt selling hypothesis are borne out by our findings.

Table 2.4A contains very little (and mixed) evidence for the **debt monitoring hypothesis**. If bankers seek representation on the board in order to monitor existing loans, then we should see more bankers on the boards of those companies that use more bank loans, that have a higher likelihood to enter financial distress, and where recovery in case of financial distress would be more difficult. Bank lending as measured by *LeverageBanks* is indeed significantly positively related to the percentage of bankers on the board in two out of three specifications

[35] In our robustness checks (not reported in the tables), we find significantly positive signs on *LeverageMarket* if we use *BankDummy* instead of *PercentBankers* (in specification (3)), or if we restrict the sample to all firm-year observations with German GAAP reporting (in all specifications).

[36] Anecdotal evidence suggests that many bank loans take the form of short-term credit lines, which would suggest that bank lending is frequently rolled over, but we have no evidence on this.

in Table 2.4A. The likelihood of financial distress should increase with volatility and decrease with interest cover. We find that the coefficients on *Volatility* are significantly negative in the two firm fixed effects regressions, which contradicts the debt monitoring hypothesis. The coefficients on *InterestCover* are statistically insignificant. Finally, the possibility to recover assets in case of financial distress should be associated with the tangibility of the assets, which we measure by the proportion of the assets that are intangible, but *Intangibles* is insignificant in all specifications.[37]

Finally, we find mixed evidence for the **equity monitoring hypothesis**, which predicts that bankers should be represented on those boards where their banks also hold significant equity stakes. Table 2.4A shows that the coefficients on *BankEquity* are significantly positive in the two Tobit specifications (1) and (2), although the relation is insignificant in the remaining four specifications.[38] If bankers act in the interest of equity holders, other blockholders should be happy to have a banker on the board, but the highly significant negative coefficient on *NonBankEquity* in specifications (1) to (4) suggests that this is not the case. This can be interpreted as indirect evidence against the equity monitoring hypothesis. If banks are concerned about their equity investments, then they should seek representation on those boards where firm valuation is lower. In our regressions, we measure this by the cross effect of *TobinsQ* and *BankEquity* which is significantly positive in specifications (1), (2), and (4). This implies that banks get involved in those firms they have invested in that have *high* Tobin's Q and this directly contradicts the equity monitoring hypothesis. Alternatively, poor performance may be related to past stock returns and we ran all our regressions again with last year's stock return instead of Tobin's Q (results not tabulated). The coefficient on stock returns is consistently negative in all specifications, but significant only once at the 10% level. More importantly,

[37] In our robustness checks (not reported in the tables), *Intangibles* is significantly negatively related to *PercentBankers* in the Granger causality regressions if we restrict the sample to all firm-year observations with German GAAP reporting.

[38] In our robustness checks (not reported in the tables), *BankEquity* is significantly negatively related to *PercentBankers* in the fixed-effects OLS regressions if we consider firm-years with German-GAAP reporting only.

the cross effect of past stock return with *BankEquity* is always positive and significantly so in the specifications that correspond to (4), (5), and (6) in Table 2.4A, which again contradicts the equity monitoring hypothesis.

When we split the sample into the two periods 1994-1999 and 2000-2005 in Table 2.4 (Panel B), we find some noteworthy differences between the two periods regarding the equity monitoring hypothesis. For the first period (1994-1999, specifications (7) to (9)), we find results similar to those for the combined sample. In the latter period (2000-2005), however, *BankEquity* is significantly positively related to *PercentBankers* not only in the Tobit regression (10), but also in the Granger causality regression (12). Many banks sold their equity stakes in non-financial firms after the capital gains tax reform in 2001 (see Table 2.3) and then often also withdrew their representatives from the board. Note, however, that the coefficient on the cross effect between *BankEquity* and *LogTobinsQ* remains significantly positive in the 2000-2005 subperiod (specifications (10) and (11)), which contradicts the equity monitoring hypothesis. Altogether, we find little evidence for and substantial evidence against the equity monitoring hypothesis.

5 What do bankers on the board do?

5.1 Bankers on boards as capital markets experts?

Several studies in the literature argue that if bankers are appointed to the boards of non-financial companies as **capital market experts**, then they should help firms to obtain the necessary financing more easily. We first investigate whether bankers on the board help firms to obtain better access to debt in general or bank debt in particular. Table 2.5 shows OLS regressions of *LeverageMarket* and *LeverageBanks* on *PercentBankers* and seven additional control variables. The regressions without lagged dependent variables show that there is a significant positive correlation between bank representation and both measures of leverage. In the Granger causality regressions, however, the coefficient on *PercentBankers* is only significant

at the 10% level for *LeverageMarket* and insignificant for *LeverageBanks*. Tables 2.4 and 2.5 therefore show that firms that rely more on debt and in particular on bank debt are more likely to have bankers on their boards. However, we cannot make any statement regarding the direction of causality.

Insert Table 2.5 here.

Access to (bank) debt financing will be most valuable in years in which firms experience financial difficulties.[39] We therefore also include *InterestCover* as a measure of financial strength in the regressions in Table 2.5, and the cross effect of *InterestCover* with *PercentBankers*. If bankers facilitate debt financing in difficult times, the coefficient on this cross effect should be negative and this is indeed the case in the regressions without a lagged dependent variable. While this finding is consistent with the capital markets expertise hypothesis, we again cannot show causality.[40] In Table 2.7 further below, we also look at the debt obtained from the same bank that is represented on the board and obtain similar results. We can conclude that distressed firms receive more loans from the banks that are represented on their boards, but we cannot show that these banks were already represented on the board *before* the additional debt financing had been obtained. The evidence is also consistent with the alternative explanation that the bank receives a board seat *when* the firm receives a loan, possibly as a condition.

A limitation of our analysis of leverage measures in Table 2.5 is that lower leverage is not necessarily a sign of being financially constrained. We therefore now turn to regressions of capital expenditure on cash flows and ask whether bankers on the board reduce the sensitivity of investment to cash flows. The argument relies on the assumption that if companies are fi-

[39] Hoshi, Kashyap, and Scharfstein (1990) show that firms in Japanese keiretsus benefit from funding through the main bank during financial distress.

[40] In unreported results, we repeat the analysis once with *PayoutRatio* and once with *ROA* instead of *InterestCover* as measure of financial strength. We obtain the same results with *ROA*, but with *PayoutRatio* all results, including the coefficients on *PercentBankers* are insignificant in all specifications. A potential reason might be that we lose an additional 15% of the observations for which we cannot calculate the payout ratio.

nancially constrained, then their capital expenditure should be responsive to their own cash flows (see Fazzari, Hubbard, and Petersen, 1988, and Hoshi, Kashyap, and Scharfstein, 1991). By contrast, if they are unconstrained, then cash flows and investment levels should be uncorrelated.[41]

This is a broader test of capital markets expertise as it is not limited to debt financing.

Insert Table 2.6 here.

Table 2.6 performs standard tests of the investment-cash flow sensitivity, where we regress investment levels on cash flows, a number of controls, and an interactive coefficient of *CashFlow* with *PercentBankers*. This interactive coefficient should be negative for financially constrained firms, so that more bankers on the board reduce the sensitivity of investment to cash flows. We follow the literature and argue that firms are more financially constrained if they have smaller dividend payouts.[42] We therefore partition the sample into those firms whose payout ratio is above the median and those whose payout ratio is below the median of the sample. We repeat this analysis for the two subperiods 1994-1999 and 2000-2005, and Table 2.6 shows our results.

For the full sample period 1994-2005, we do not find any significant results: all the interactive coefficients are insignificant, and they do not differ significantly between the two subsamples. There is also no evidence that bank representation has a direct effect on capital expenditures. When we look at the two subperiods, however, we find a significant difference in the cross effect *CashFlow*PercentBankers* between constrained and unconstrained firms for both subperiods. For the 1994-1999 subsample, bankers on the board facilitate financing and invest-

41 This argument is not uncontroversial. Alti (2003) shows that even in a standard neoclassical investment model without financial constraints there can be a correlation between investment levels and cash flows because cash flows reveal information about the productivity of future investments, so that companies with higher cash flows tend to invest more.

42 In unreported results, we split our sample according to size (total assets). We do not obtain any significant results in this case, which perhaps is not so surprising given that all companies in our sample are by some definition large. Güner, Malmendier and Tate (2008) argue that payout policy and size may be poor proxies for financial constraints. Kaplan and Zingales (1997) develop an index of financial constraints for the U.S., but no similar index is available for Germany.

ment for financially constrained firms. For the 2000-2005 sample however, we obtain the opposite signs, which implies that bankers increase their lending to financially *unconstrained* firms rather than to constrained firms. Under one interpretation, German firms had many growth options in the earlier period, which they could not finance internally, so that they were constrained. By comparison, they had only few growth options in the latter period, where they were unconstrained. Under another interpretation, this result is consistent with the debt-selling hypothesis. Güner, Malmendier, and Tate (2008) find the same signs in their U.S. sample as we do in our 2000-2005 subsample, so Table 2.6 can be seen as another indication that the German system of corporate governance has converged to the Anglo-Saxon model. Altogether, we cannot infer any consistent evidence from Table 2.6 that would support the capital markets expertise hypothesis.

5.2 Bankers on boards as sales agents?

We investigate three aspects of the notion that bankers may act as sales agents for their bank. We first investigate if bankers persuade the companies on whose boards they are represented to take on more debt and, more specifically, debt from the bank they are representing. We then look at the debt provided by a bank to an industry and ask whether board representation in an industry helps to acquire industry expertise and to sell more debt to other firms in the industry. Finally, we investigate if bankers sell M&A advisory services to companies through their board representation.

Insert Table 2.7 here.

In Table 2.7, we consider individual bank-firm relations in more detail and turn to regressions of bank-firm-year observations in order to investigate the **debt selling** hypothesis. The table displays results of five Tobit regressions of $FirmBankDebt_{i,j,t}$, the debt provided by bank j to firm i in year t. The independent variables are the lagged dependent variable, $FirmBankDebt_{i,j,t\text{-}1}$, the dummy $ThisBankOnBoard_{i,j,t\text{-}1}$, which equals one if bank j has a

banker on the board of firm *i* in year *t*–1, the dummy *AnotherBankOnBoard* $_{i,j,t-1}$, which indicates whether a bank other than *j* has a banker on the board of firm *i*, and a number of controls that describe firm *i* in more detail. As the controls do not vary across the ten banks within one firm-year section, we report robust standard errors with firm-year clusters for the Tobit specifications in Table 2.7.[43]

All specifications in Table 2.7 indicate that a given bank sells more debt to firms where it is represented on the board and less to firms where another bank is represented on the board. This effect is highly significant except in the Granger causality regression (5) with year, industry, and bank fixed effects, where *ThisBankOnBoard* becomes insignificant. This last regression sets the highest hurdle for finding significant results, so it is not surprising that we lose significance here. The fixed effects regressions (1) and (2) show that there is a positive relation between bank representation and lending of the same bank (even if we control for the identity of firm and bank), while regression (3) and (4) show that (Granger) causality runs from bank representation to lending. Note that the negative effect of *AnotherBankOnBoard* remains significant in all specifications. We therefore conclude that there is compelling evidence that banks on the board of non-financial firms increase lending to these firms and to some extend replace other banks as lenders.

Having bankers on the board who try to sell their own bank's debt need not be detrimental to the firm as the terms of these loans might be preferential. We do not have any data about the terms of the loans provided, but Table 2.7 contains some indirect evidence: *NonBankEquity* has a significant negative effect on *FirmBankDebt* in all specifications. This finding might simply be due to the fact that firms with non-bank blockholders generally have lower leverage (see Table 2.5), possibly because these firms have better access to equity financing. Alternatively, it can be interpreted as an indication that debt sold through bankers on the board is not in the interest of the firm and is restricted if non-bank blockholders are present.

[43] We have only 10 banks left here because of the merger that created HypoVereinsbank.

Table 2.7 also contains some evidence for the capital markets expertise hypothesis. In specification (1), the cross effect of *InterestCover* and *ThisBankOnBoard* has a highly significant effect on *FirmBankDebt*, but this effect is insignificant in the remaining regressions. We obtain the same result if we use *PayoutRatio* or *ROA* as an indicator of financial difficulty instead of *InterestCover*. So in bad times firms that have bankers on their boards also hold more debt from the banks represented on the board, but our results are silent regarding the direction of causality.

It could also be that banks seek appointments to supervisory boards to gain **industry expertise** and lending possibilities that are industry-specific, for example, because lending prospects are sensitive to industry cycles. To the best of our knowledge, we are the first to formulate and investigate this hypothesis. We therefore repeat our analysis from Table 2.7 on the bank-industry level and average *FirmBankDebt* across those firms within each industry-year where the bank considered is *not* represented on the board of directors. This yields our new variable $IndustryBankDebt_{k,j,t}$, which is the average bank debt (scaled by total assets) that bank j provides to those firms in industry k in year t, where bank j has no representative on the board. Table 2.8 shows the results of four Tobit regressions of *IndustryBankDebt* on $PercentBankersThisBank_{k,j,t}$, the average proportion of board seats held by bank j in industry k and year t. The regressions include six additional, firm-specific variables that are all averaged across firms in each industry-year, and regressions (2) to (4) also include the lagged dependent variable.

Insert Table 2.8 here.

The coefficient on *PercentBankersThisBank* is always positive and statistically highly significant in two of the four specifications in Table 2.8. In the specifications that involve bank dummies, however, the effect is insignificant. In contrast to Table 2.7, results also become insignificant in the bank fixed effects regression (1) without a lagged dependent variable. In

our robustness checks (not shown in the tables), we obtain somewhat stronger results: If we consider only firm-year observations with German GAAP reporting, specification (1) becomes significant, and if we use *BankDummy* instead of *PercentBankers* as an indicator of bank involvement, all specifications are significant at least at the 10% level. Altogether, we find some evidence for the industry expertise hypothesis.

Finally, we turn to the hypothesis that bankers **sell M&A advisory services** to the firms on whose boards they are represented. In contrast to the United States, banks in Germany have always been universal banks that include investment banking divisions. From *SDC Platinum*, we collect data on 4,097 acquisitions undertaken by 115 of the non-financial firms in our sample. For only 67 acquisitions undertaken by 28 sample firms is the advisor also one of the sample banks; most acquisitions are small and therefore done without an advisor. We delete all firm-year observations without any acquisition and construct the variable $PercentAcqAdvisor_{i,j,t}$ as the number of acquisitions of firm i in year t, where bank j was hired as the advisor, scaled by the total number of acquisitions for this firm-year. In Table 2.9, we regress *PercentAcqAdvisor* on *ThisBankOnBoard* and four other firm-specific control variables. Specification (1) does this for all banks in our sample. In specifications (2) and (3), we separately consider those two banks that have a large investment banking business, i.e. Dresdner Bank and Deutsche Bank. We use robust standard errors clustered at the firm-year level to compute significance levels for specification (1).

Insert Table 2.9 here.

In all specifications, we observe a significant and positive relationship between bank representation and *PercentAcqAdvisor*, even though the number of uncensored observations is small in each case (15 for Dresdner Bank, 32 for Deutsche Bank). We can safely conclude that bankers on the boards of large, non-financial firms successfully promote the M&A advisory services of their employer.

5.3 Bankers on boards as monitors?

We have discussed the potential role of bankers on the boards as monitors of their equity interests or of their interests as creditors in Section 4 and found no evidence that either version of the monitoring hypothesis might explain why bankers join the boards of non-financial companies. However, they may still act as monitors once they are appointed to these boards. We therefore investigate how bankers affect the investment behavior and financial policies of firms.

Insert Table 2.10 here.

Table 2.10 shows regressions that address the influence of bank representation on the payout ratio and on volatility. The **equity monitoring hypothesis** postulates that bankers on the board pursue the interests of their banks as equity-holders. In order to investigate this hypothesis more directly, we split *PercentBankers* into those bankers that represent equity interests on the board (*PercentBankersWithEquity*) and those bankers on the board whose bank does not have an equity interest in the company at the same time (*PercentBankersWithoutEquity*). We should then see that banks that also own equity use their influence to increase the payout ratio and to shift risk and thereby increase volatility. There is virtually no evidence for this in Table 2.10. The coefficient on *PercentBankersWithEquity* is always insignificant, and *BankEquity* becomes significant only once (specification (1)) and then with the opposite sign compared to what we would expect.[44] A potential reason for the insignificant results for *Volatility* is that the leverage of our sample companies is not high enough (the median of *LeverageMarket* is 24.8% from Table 2.2) to generate significant risk shifting incentives for equity holders.

[44] In our robustness checks (not shown in the tables), *BankEquity* also has a significant negative effect on the payout ratio in the Granger causality regression (3) when we use *BankDummy* instead of *PercentBankers* or when we restrict the sample to those firm-year observations with German GAAP reporting only.

The implications of the **debt monitoring hypothesis** for the relationship between *Percent-Bankers* and, respectively, *PayoutRatio* and *Volatility*, are the opposite of those suggested by the equity monitoring hypothesis, but most coefficients are insignificant. The only exception is the effect of *PercentBankersWithoutEquity* on *Volatility* in specification (5), which is significant at the 5% level but has the opposite sign than expected under the debt monitoring hypothesis. Hence, we cannot find any support for the debt monitoring hypothesis based on these results.

Insert Table 2.11 here.

In Table 2.11, we investigate the relationship between equity ownership and management compensation. Disclosure on compensation in Germany is poor by U.S. or U.K. standards and before 2006, publicly listed companies had to disclose only the aggregate compensation of the management board and the supervisory board, without providing a breakdown by person or by compensation components (fixed pay, bonus payments, stock options, etc.). We therefore cannot evaluate pay for performance sensitivities. Instead, we resort to *LogAvgManComp*, which is the logarithm of the average total compensation per member of the management board. These data are available only from 1997 onwards, so the number of observations for our regressions is somewhat reduced.

Table 2.11 shows that the impact of bankers on average management compensation is negative if these bankers represent equity interests on the board, but this effect is significant at the 10% level only in specification (2). All other bankers, whose supervisory board seats are not associated with equity ownership, have an insignificant impact on average management compensation. The difference between the coefficients on *PercentBankersWithEquity* and *PercentBankersWithoutEquity* is statistically significant at the 10% level in the Granger causality

regression (3) (the p-values are reported at the bottom of Table 2.11).[45] This implies that managerial pay decreases in firms where bankers with equity interests are on the board compared to firms where bankers without equity interests are on the board. Note that *Non-BankEquity* has a highly significant negative effect on average compensation in all specifications. This suggests that lower compensation does not reflect lower managerial skills but rather lower managerial rents. Altogether, the equity monitoring hypothesis has some explanatory power here, but only for the minority of bankers who actually represent equity interests.

6 The value of having a banker on the board

Our final question addresses the relationship between bank representation on the board and firm performance, where we use Tobin's Q and return on assets (ROA) as performance measures.[46] Table 2.12 regresses *LogTobinsQ* on *PercentBankers*, ownership variables, and a range of controls. Here it is conventional to also control for some value drivers (productivity, sales growth, R&D), although we are not convinced by this approach for our purpose. Ultimately, if bank representation on the board affects valuation, then it has to affect some value driver (such as profitability or growth), and for our question the precise transmission channel is of secondary importance. Therefore, if we control for value drivers, then we control to some extent for the effect we are trying to measure. Our preferred specifications are therefore models (1), (3), and (5) in Table 2.12, but we include the regressions with more controls (2), (4), and (6) for better comparison with the literature. As R&D expenditures need not be reported according to German GAAP, we set this item equal to zero if it is missing. In Table 2.13, we repeat this analysis with *ROA* instead of *LogTobinsQ* as the dependent variable.

Insert Table 2.12 and 2.13 here.

[45] If we use *BankDummy* instead of *PercentBankers*, this difference is significant at the 2% level. However, if we include three lags of the dependent variable, this difference becomes insignificant. These results are not shown in the tables.

[46] For Switzerland, another universal banking country, Tobin's Q is not significantly correlated with the presence of bankers on the board (Loderer and Peyer, 2002).

Specifications (1) and (2) in both tables show that there is a significant negative relation between bankers on the board and firm performance. This result is reflected in specifications (1) and (2) in Table 2.4, where we regress *PercentBankers* on *LogTobinsQ*. In the firm fixed regressions (3) and (4) in Table 2.12 and 2.13, however, *PercentBankers* is insignificant, which implies that the negative relationship only holds between firms but not necessarily within firms.[47] In the Granger causality regression (5) in Table 2.13, *PercentBankers* has a negative effect on *ROA* that is significant at the 10% level. With the additional controls in regression (6), this effect becomes insignificant. Here, the additional control *LeverageBook* becomes significant, and from Table 2.5 we know that bankers have a positive effect on leverage.[48] Hence, Table 2.13 provides weak evidence that bank representation Granger causes lower firm performance.

The result of the Granger causality regressions for Tobin's Q in Table 2.12 is puzzling. This result persists in all our robustness checks with the only exception that it becomes insignificant in the 2000-2005 subsample. At face value, it implies that *PercentBankers* has a significant negative effect on *LogTobinsQ*. However, note that Tobin's Q is a forward-looking measure. So, with efficient markets Tobin's Q should adjust immediately if there is causality from bank representation to Tobin's Q, so that $PercentBankers_{t-1}$ should have no impact on $LogTobinsQ_t$ if we control for the lagged value $LogTobinsQ_{t-1}$. There are two possible ways to interpret the negative effect of *PercentBankers* on *LogTobinsQ* in Table 2.12 (specifications (5) and (6)) and the insignificant effect of *LogTobinsQ* on *PercentBankers* in Table 2.4 (specifications (5) and (6)). First, if the market does not immediately and fully incorporate the in-

[47] If we split the sample in two periods 1994-1999 and 2000-2005, the relation between *PercentBankers* and *Tobin's Q* becomes significantly positive at the 10% level in the fixed-effects regressions in the 1994-1999 period. This finding is in line with the positive sign on *LogTobinsQ* in specifications (3), (4), (8) and (11) in Table 2.4. It implies that bankers are generally represented in low-performance firms, but within these firms, they are more likely to be on the board during (relatively) high-performance years.

[48] These results are robust if we include three lags of the dependent variable or if we consider observations with German GAAP reporting only. However, if we use *BankDummy* instead of *PercentBankers* or if we consider the two periods 1994-1999 and 2000-2005 separately, the impact of bank presence on ROA becomes insignificant in the Granger causality regressions (5) and (6), although it remains significant in the OLS regressions (1) and (2).

formation of a new board appointment, the evidence suggests that bank representation indeed causes lower Tobin's Q. Alternatively, the appointment of bankers could be forward looking, so that firms that expect lower Tobin's Q appoint bankers (presumably to improve performance) or bankers choose firms with lower expected Tobin's Q. This second interpretation also presupposes that the market does not correctly infer the information contained in the appointment of a banker. The evidence is not consistent, however, with the hypothesis that performance *first* deteriorates and bankers are *then* appointed to the board. So while we cannot distinguish the direction of causality econometrically, we consider the possibility that bankers are generally appointed when low performance is anticipated but not when low performance occurs as rather remote. We therefore interpret Tables 2.12 and 2.13 as weak evidence that bankers on the boards of non-financial firms have a negative effect on performance as measured by Tobin's Q and ROA. The size of this effect is substantial: For a board with average size of seven, the decrease in ROA caused by an additional banker ranges from 0.4 to 1.1 percentage points while Tobin's Q decreases by 1.9% to 8%.

7 Assessment of the hypotheses: Putting it all together

In this section, we summarize our results with respect to the hypotheses developed in Section 2. Our evidence is strongest for the hypothesis that bankers seek board seats in non-financial firms in order to promote their own business. We investigate three aspects of this hypothesis and find evidence for all of them. First, the **debt selling hypothesis** suggests that bankers seek seats on the boards of companies with underutilized debt capacities in order to sell new loans. Our discussion of Table 2.4 finds some evidence for this, as smaller, more volatile firms have fewer bankers on their boards. We then investigate this hypothesis using more detailed data and find strong evidence that bankers increase borrowing from their own bank and to some extend also reduce borrowing from other banks (Table 2.7). Second, we find strong support for the hypothesis that bankers on the board **sell M&A advisory services** of their

own investment banking divisions. Some large companies in our sample regularly acquire smaller companies, and the M&A-advisory work is significantly more often done by the bank that is represented on the board than by another bank in our sample (see Table 2.9). However, this concerns only a minority of the companies in our sample. Finally, the **industry expertise hypothesis** holds that bankers seek board appointments in order to gain insider knowledge of industry cycles and to better adjust their lending policies. We find that higher board representation in companies of a certain industry is followed by a significantly higher lending volume to that industry, even if we exclude the firms where the bank is represented on the board (Table 2.8), although this result is not robust to the inclusion of bank fixed effects.

We also find substantial evidence for the **capital markets expertise hypothesis**. Financial experts are more likely to be appointed to the board if firms enjoy fast growth (Table 2.4), and they help distressed firms to obtain additional loans from banks (Tables 2.5 and 2.7). On the other hand, our tests of the investment-cash flow sensitivity (Table 2.6) lend support to this hypothesis only for the earlier part of our sample.

On the other hand, we can rule out the hypothesis that bankers are on the board of non-financial firms in order to monitor the firm and to represent the bank's debt or equity interests. None of the implications of the **debt monitoring hypothesis** that we test in Tables 2.4 and 2.10 are borne out by the data with the exception of the prediction that board representation is positively related to bank debt, which in itself is only very indirect evidence for this hypothesis. Our findings from Table 2.4 that volatility and board representation are negatively related in some specifications directly contradict this hypothesis. These findings can be explained much better with the debt selling hypothesis. We also find little evidence for and substantial evidence against the **equity monitoring hypothesis**. We find weak evidence that bankers are more likely to withdraw from boards if their banks sell their equity stakes in the respective companies (Table 2.4) and that bankers on the board are associated with lower managerial pay

(Table 2.11). On the other hand, our analysis yields several results that contradict the equity monitoring hypothesis: When banks hold an equity stake in non-financial firms, they are more likely to have a representative on the board if performance (as measured by Tobin's Q) is high (Table 2.4). Also, equity stakes held by non-banks have a negative impact on bank representation (Table 2.4), and bankers on the board potentially have a negative impact on firm performance (Tables 2.12 and 2.13).

8 Conclusions

This chapter analyses the network of cross shareholdings and board representations between banks and non-banks in Germany between 1994 and 2005. We find that shareholdings by banks in non-financial firms declined by about 90% after a capital gains tax reform became effective in January 2002. However, indicators of board representation fell by only 30-40% during the same period. Even the values of the measures of bank ownership and board representation at the beginning of our sample period are much lower than those reported in earlier studies of the 1970s and the 1980s, and we therefore conclude that the German model of corporate financing and corporate governance witnessed a slow and steady decline and has by now largely adjusted to international standards.

These developments caused an increased variation in bank influence on non-financial firms. We take advantage of this increased variation and analyze the effect of bank influence on the financial policies and the performance non-financial firms. We cannot find much evidence for the hypothesis that bankers are on the boards of other firms as monitors, neither as lenders nor as equity holders. In fact, by the end of our sample period, banks are not owners of any significant equity interests anymore. In contrast, we find some evidence that bankers are on the boards of non-financial firms as capital market experts and that they help these firms to overcome financial constraints. Our strongest results, however, suggest that bankers on the board successfully promote their employer's business:

- Banks sell more debt to firms where they are represented on the board, and somewhat less debt to firms where other banks are represented on the board. Hence, bankers increase lending to the firms where they occupy board seats and replace other banks as lenders to some extent.
- Banks also sell more debt to firms in industries where they hold more board seats, even to firms where they are not represented on the board. This implies that bankers gain important information through their board memberships and that they use this industry expertise to increase their lending to the whole industry.
- Banks that are represented on the board are more likely to be chosen as M&A advisor if the firm undertakes an acquisition.

Consistent with these findings, we find evidence that suggests a negative causal effect of the presence of a banker on the firm's board on firm performance. Our results make us critical of the ability of German banks to use the power of their proxy voting rights to have their own managers elected to the boards of non-financial companies. This arrangement gives banks the power to influence non-financial firms without having any equity incentives themselves. Minority shareholders can evidently not overcome their collective action problem, while bankers use their board seats to promote their own business.

9 Tables

Table 2.1: Definitions of variables used in this chapter

This table defines all variables at the firm-year level used in this chapter. Board data are taken from *Hoppenstedt company profiles*, accounting data from *Worldscope* and market data from *Datastream*. The numbers in brackets refer to *Worldscope* items, taken from the *Worldscope Data Definition Guide*. Bank debt data was provided by *Deutsche Bundesbank*, it includes all individual (sample) bank-firm credit relations that exceed €1.5 million.

Variable	Description
AvgManComp.	Total management board compensation divided by the number of managers (in thousand €) (*Hoppenstedt*)
BankDebt	Total volume of credit relations between the respective firm and all sample banks that exceed €1.5m (*Deutsche Bundesbank*)
BankDummy	= 1 if one or more members of the company's supervisory board are classified as Bankers (*Hoppenstedt*). A director is classified as a "banker" if she currently is or previously was a member of the management board of one of the banks in our sample. A former banker is not classified as a banker any longer if she becomes member of the management board of a non-bank in our sample.
BankEquity	Sum of all voting blocks held by banks (*Hoppenstedt*)
BoardSize	Number of supervisory board members appointed by shareholders (*Hoppenstedt*)
CapEx	= Capital expenditure [04601] / total assets [02999]
CashFlow	= (Earnings before extraordinary items [01751] + depreciation [01151]) / total assets [02999]
FreeFloat	= 1 – *BankEquity* – *NonBankEquity*
Intangibles	= Intangible assets [02649] / total assets [02999]
InterestCover	= EBIT [18191] / interest expense on debt [01251]
LeverageBanks	= *BankDebt* / (total debt [03255]+ market capitalization [08001])
LeverageBook	= Total debt [03255] / (total debt + common equity [03501])
LeverageMarket	= Total debt [03255] / (total debt + market capitalization [08001])
MarketCap	= Market capitalization [08001]
NonBankEquity	Sum of all voting blocks held by non-banks (*Hoppenstedt*)
PayoutRatio	= Common dividends (cash) / Net Income after preferred [08256]
PercentBankers	Number of Bankers on the supervisory board divided by *BoardSize* (*Hoppenstedt*). See *BankDummy* for a definition of a banker.
PercentBankers WithEquity	Number of Bankers on the supervisory board that come from banks which do hold voting blocks, divided by *BoardSize* (*Hoppenstedt*)
PercentBankers WithoutEquity	Number of Bankers on the supervisory board that come from banks which hold no voting blocks, divided by *BoardSize* (*Hoppenstedt*)
Productivity	= Net sales or revenues [01001] / number of employees [07011]
R&D	= Research and Development expenditure [01201] / total assets [02999]
ROA	Return on Assets: $EBIT_t$ [18191] / {(total $assets_t$ [02999] + total $assets_{t-1}$)/2}
Sales	= Net sales or revenues [01001]
SalesGrowth	= (net $sales_t$ [01001] – net $sales_{t-1}$) / net sales $_{t-1}$
TobinsQ	= (market capitalization [08001] + total assets [02999] – common equity [03501]) / total assets
TotalAssets	= total assets [02999]
Volatility	Standard deviation of daily excess returns (from market model) over the preceding calendar year (own computations; data from *Datastream*)

Table 2.2: Summary statistics

This table displays descriptive statistics for 27 variables used in our analysis. Board data are taken from *Hoppenstedt* company profiles, accounting data from *Worldscope*, and market data from *Datastream*. Bank debt data was provided by the *Deutsche Bundesbank*, it includes all individual (sample) bank-firm credit relations that exceed €1.5 million. Only non-financial firm year observations are used.

Variable	N	Mean	Median	Standard deviation	Minimum	Maximum
AvgMan.Comp. ('000 €)	1051	833.6	636.0	645.0	5.0	5,676.6
BankDebt (in million €)	1367	377.5	79.5	767.1	0	8,395.2
BankDummy	1388	0.46	0.00	0.50	0	1
BankEquity	1388	3.3%	0.0%	9.3%	0.0%	91.0%
BankEquity if BankEquity>0	251	18.3%	13.2%	14.3%	0.5%	91.0%
BoardSize	1388	7.06	6	2.13	2	15
CapEx	1328	0.071	0.056	0.064	0	0.680
CashFlow	1338	0.090	0.090	0.070	-0.291	0.950
Intangibles	1332	0.091	0.042	0.116	0	0.754
InterestCover	1336	15.365	3.961	59.434	0	858.672
LeverageBanks	1279	0.146	0.067	0.251	0	3.042
LeverageBook	1324	0.379	0.379	0.239	0	0.996
LeverageMarket	1296	0.274	0.248	0.211	0	0.980
MarketCap (in million €)	1296	4,850	780	12,293	4	213,794
NonBankEquity	1388	53.8%	56.0%	32.1%	0.0%	100.0%
PayoutRatio	1139	31.8%	29.9%	25.7%	0.0%	99.9%
PercentBankers	1388	8.8%	0.0%	10.9%	0.0%	50.0%
PercentBankersWithEquity	1388	2.0%	0.0%	7.0%	0.0%	50.0%
PercentBankersWithoutEquity	1388	6.0%	0.0%	9.0%	0.0%	50.0%
Productivity ('000 €/employee)	1333	237	177	332	32	7,988
R&D	1338	0.020	0.000	0.036	0	0.231
ROA	1321	7.9%	6.8%	8.2%	-44.9%	67.1%
Sales (in million €)	1338	8,219	1,910	17,987	13	162,384
SalesGrowth	1322	9.7%	5.4%	81.5%	-94.8%	2,840.4%
TobinsQ	1282	1.54	1.24	1.03	0.67	12.53
TotalAssets (in million €)	1338	9,664	1,405	25,427	24	206,985
Volatility	1308	0.337	0.312	0.165	0.047	2.372

Table 2.3: Trends for bankers on the board, ownership structure, Tobin's Q, and compensation

This table displays annual means of nine variables that describe bank's board representation, ownership structure, Tobin's Q, and compensation. For each column, the means are calculated only from those firms for which the corresponding variable was available for all years shown in the table. The corresponding number of firms is shown in the last row. See Table 2.1 for a definition of the variables. Compensation data is generally not available before 1997.

Year	Board Size	Bank Dummy	Percent Bankers	Bank Equity	NonBank Equity	Free Float	TobinsQ	AvgManComp	
								'000 €	scaled by firm value
1994	6.92	0.507	0.096	0.041	0.554	0.405	1.52		
1995	6.93	0.533	0.101	0.036	0.559	0.405	1.50		
1996	6.93	0.493	0.093	0.054	0.550	0.397	1.48		
1997	6.96	0.507	0.093	0.043	0.541	0.415	1.62	616.4	0.0690%
1998	6.92	0.533	0.103	0.037	0.543	0.420	1.64	676.2	0.0773%
1999	7.08	0.533	0.103	0.036	0.520	0.444	1.52	715.6	0.0799%
2000	7.08	0.547	0.106	0.031	0.528	0.441	1.53	856.0	0.0947%
2001	7.05	0.520	0.100	0.041	0.518	0.440	1.49	899.5	0.0847%
2002	7.05	0.507	0.099	0.025	0.519	0.456	1.26	953.2	0.0882%
2003	6.97	0.400	0.073	0.028	0.529	0.443	1.40	1,142.6	0.0786%
2004	6.93	0.360	0.064	0.014	0.475	0.511	1.43	1,258.5	0.0809%
2005	6.93	0.333	0.056	0.004	0.477	0.519	1.48	1,377.0	0.0656%
# Firms	75	75	75	75	75	75	59	58	58

Table 2.4: Determinants of the percentage of bankers on the board

The table presents results for Tobit and OLS regressions with *PercentBankers* as dependent variable. All explanatory variables are lagged by one year. See Table 2.1 for a definition of all variables. For each explanatory variable, the table displays the slope estimate and, in parentheses, the t-statistic of the two-sided test for zero slope. Panel A displays our results for the full sample 1994-2005 and Panel B shows the results for the two subsamples 1994-1999 and 2000-2005.

Panel A: Full sample results: 1994-2005

	(1)	(2)	(3)	(4)	(5)	(6)
Method	Tobit		OLS		Tobit	
Lagged PercentBankers					1.1595	1.1570
					(39.98)	*(39.74)*
BankEquity	0.2401	0.2077	-0.0016	-0.0192	0.0500	0.0502
	(2.85)	*(2.45)*	*(-0.04)*	*(-0.46)*	*(1.23)*	*(1.23)*
NonBankEquity	-0.0823	-0.0778	-0.0553	-0.0534	-0.0057	-0.0059
	(-3.88)	*(-3.68)*	*(-4.58)*	*(-4.49)*	*(-0.55)*	*(-0.57)*
LogSales	0.0444	0.0438	0.0286	0.0285	0.0131	0.0130
	(9.60)	*(9.54)*	*(5.28)*	*(5.36)*	*(5.80)*	*(5.80)*
CapEx	0.1021	0.1383	0.0899	0.0864	0.0619	0.0679
	(1.06)	*(1.44)*	*(1.98)*	*(1.92)*	*(1.31)*	*(1.43)*
Intangibles	0.0320	0.0731	-0.0310	-0.0143	-0.0315	-0.0229
	(0.50)	*(1.14)*	*(-0.87)*	*(-0.41)*	*(-1.01)*	*(-0.73)*
Volatility	-0.0303	-0.0380	-0.0378	-0.0408	-0.0292	-0.0263
	(-0.70)	*(-0.89)*	*(-2.53)*	*(-2.67)*	*(-1.39)*	*(-1.26)*
LeverageMarket	0.0233		0.0215		0.0186	
	(0.64)		*(1.29)*		*(1.04)*	
LeverageBanks		0.0684		0.0888		0.0055
		(2.79)		*(5.79)*		*(0.48)*
InterestCover	-0.0003	-0.0003	0.0000	0.0000	-0.0002	-0.0002
	(-1.50)	*(-1.40)*	*(-0.81)*	*(-0.66)*	*(-1.20)*	*(-1.21)*
SalesGrowth	0.0063	0.0065	0.0038	0.0039	0.0087	0.0086
	(1.13)	*(1.18)*	*(1.93)*	*(2.01)*	*(3.48)*	*(3.43)*
LogTobinsQ	-0.0640	-0.0603	0.0147	0.0192	0.0052	0.0003
	(-2.56)	*(-2.73)*	*(1.43)*	*(2.00)*	*(0.41)*	*(0.03)*
BankEquity*LogTobinsQ	0.9657	1.0543	0.2237	0.2762	-0.0327	-0.0463
	(2.62)	*(2.87)*	*(1.51)*	*(1.90)*	*(-0.19)*	*(-0.26)*
Fixed Effects	Year, Industry		Year, Firm		Year, Industry	
Observations	1,133	1,122	1,133	1,122	1,133	1,122
Uncensored observations	533	533			533	533

Panel B: Subsample results: 1994-1999 and 2000-2005

	(7)	(8)	(9)	(10)	(11)	(12)
Period		1994-1999			2000-2005	
Method	Tobit	OLS	Tobit	Tobit	OLS	Tobit
Lagged PercentBankers			1.0833			1.2671
			(27.72)			*(28.11)*
BankEquity	0.1585	0.0334	-0.0395	0.2522	-0.0305	0.1313
	(1.25)	*(0.31)*	*(-0.64)*	*(2.10)*	*(-0.68)*	*(2.50)*
NonBankEquity	-0.0886	-0.0612	-0.0160	-0.0723	-0.0123	-0.0025
	(-3.02)	*(-2.66)*	*(-1.06)*	*(-2.32)*	*(-0.75)*	*(-0.17)*
LogSales	0.0300	0.0245	0.0123	0.0548	0.0276	0.0119
	(4.71)	*(2.51)*	*(3.81)*	*(8.05)*	*(2.67)*	*(3.71)*
CapEx	0.1040	-0.0120	0.0783	0.1765	0.1093	0.0672
	(0.76)	*(-0.15)*	*(1.11)*	*(1.29)*	*(2.00)*	*(1.06)*
Intangibles	0.0727	-0.0829	-0.0044	0.1132	-0.0583	-0.0179
	(0.70)	*(-1.06)*	*(-0.08)*	*(1.30)*	*(-1.22)*	*(-0.47)*
Volatility	-0.0365	-0.0611	-0.0348	0.0058	-0.0249	0.0062
	(-0.65)	*(-1.50)*	*(-1.25)*	*(0.09)*	*(-1.22)*	*(0.19)*
LeverageBanks	0.0812	0.0858	0.0282	0.0683	0.0892	-0.0107
	(2.35)	*(3.48)*	*(1.65)*	*(1.92)*	*(4.74)*	*(-0.68)*
InterestCover	-0.0003	0.0000	-0.0002	-0.0004	0.0000	-0.0004
	(-1.26)	*(0.06)*	*(-1.01)*	*(-0.84)*	*(0.48)*	*(-1.05)*
SalesGrowth	0.0066	0.0035	0.0079	0.0025	-0.0001	0.0078
	(1.22)	*(1.63)*	*(3.00)*	*(0.08)*	*(-0.01)*	*(0.52)*
LogTobinsQ	-0.0589	0.0338	0.0062	-0.0475	0.0127	-0.0021
	(-1.87)	*(1.73)*	*(0.36)*	*(-1.43)*	*(1.13)*	*(-0.12)*
BankEquity*LogTobinsQ	0.8597	0.1432	0.0777	1.5542	0.5187	0.1222
	(1.67)	*(0.49)*	*(0.30)*	*(2.65)*	*(2.57)*	*(0.50)*
Fixed Effects	Year, Industry	Year, Firm	Year, Industry	Year, Industry	Year, Firm	Year, Industry
Observations	495	495	495	627	627	627
Uncensored observations	285		285	248		248

Table 2.5: The effect of bank representation on leverage

The table presents results for OLS regressions with market leverage and (sample) bank leverage as dependent variables. All explanatory variables are lagged by one year. All regressions also contain a German GAAP dummy variable (not shown) that indicates whether the financial statements adhered to the local German accounting standard. See Table 2.1 for a definition of all variables. For each dependent variable, the table displays the slope estimate and, in parentheses, the t-statistic of the two-sided test for zero slope based on robust heteroscedasticity consistent standard errors, which also allow for autocorrelation of one lag (Newey-West).

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	LeverageMarket			LeverageBanks		
Lagged dependent variable			0.8667			0.8595
			(47.72)			*(15.04)*
PercentBankers	0.2813	0.2510	0.0664	0.3323	0.2686	-0.0310
	(3.54)	*(2.64)*	*(1.82)*	*(1.99)*	*(2.24)*	*(-0.65)*
BankEquity	-0.0167	-0.2112	-0.0652	0.0837	0.0046	-0.0374
	(-0.18)	*(-2.29)*	*(-1.26)*	*(0.57)*	*(0.06)*	*(-0.53)*
NonBankEquity	-0.0635	-0.0944	-0.0213	-0.1137	-0.0159	-0.0234
	(-2.17)	*(-2.79)*	*(-1.79)*	*(-4.44)*	*(-0.61)*	*(-1.93)*
LogSales	0.0224	0.0409	-0.0004	0.0122	0.0242	0.0019
	(3.69)	*(2.99)*	*(-0.14)*	*(1.90)*	*(2.23)*	*(0.72)*
CapEx	0.1835	-0.3591	0.1117	-0.4484	-0.1119	-0.0374
	(1.46)	*(-3.30)*	*(1.83)*	*(-3.80)*	*(-1.24)*	*(-0.95)*
Intangibles	0.1982	0.3933	0.0288	-0.4512	0.0324	-0.0418
	(2.70)	*(5.08)*	*(0.89)*	*(-6.52)*	*(0.74)*	*(-1.52)*
Volatility	0.1730	-0.0025	-0.0089	0.2206	-0.0433	0.0067
	(2.30)	*(-0.08)*	*(-0.41)*	*(2.63)*	*(-1.55)*	*(0.34)*
InterestCover	-0.00068	-0.00002	-0.00008	-0.00050	-0.00006	-0.00010
	(-4.98)	*(-0.52)*	*(-3.10)*	*(-7.77)*	*(-1.67)*	*(-3.18)*
InterestCover*PercentBankers	-0.0209	-0.0095	-0.0015	-0.0164	-0.0051	-0.0004
	(-6.60)	*(-3.25)*	*(-1.43)*	*(-4.65)*	*(-2.78)*	*(-0.37)*
Fixed Effects	Year, Industry	Year, Firm	Year, Industry	Year, Industry	Year, Firm	Year, Industry
Observations	1129	1129	1126	1118	1118	1112

Table 2.6: The effect of bank representation on capital expenditures

The table presents results for OLS regressions with capital expenditure as the dependent variable. Results are shown for the full sample and for two sample split-ups. "PayoutRatio=low" is the subsample for which the payout ratio is smaller or equal to the sample median, while "PayoutRatio = high" is the subsample for which the payout ratio is larger than the sample median. Specifications (1) to (3) show the results for the full sample period 1994-2005, while specifications (4) to (7) look at the two subperiods 1994-1999 and 2000-2005. All regressions also contain a German GAAP dummy variable (not shown) that indicates whether the financial statements adhered to the local German accounting standard. See Table 2.1 for a definition of all variables. For each explanatory variable, the table displays the slope estimate and, in parentheses, the t-statistic of the two-sided test for zero slope based on robust heteroscedasticity consistent standard errors, which also allow for autocorrelation of one lag (Newey-West). The table also reports the p-value of the standard t-test that the coefficients of the cross effect "CashFlow*PercentBankers" is identical between the two corresponding subsamples.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Period		1994-2005		1994-1999		2000-2005	
Subsample	Full Sample	PayoutRatio		PayoutRatio		PayoutRatio	
		low	high	low	high	low	high
CashFlow	0.3076	0.3014	0.5786	0.4825	0.4039	0.1027	0.7172
	(3.14)	*(2.34)*	*(4.44)*	*(3.32)*	*(2.54)*	*(1.38)*	*(2.68)*
PercentBankers	0.0232	0.0218	-0.0075	0.1182	-0.1383	-0.0256	0.2068
	(0.57)	*(0.42)*	*(-0.11)*	*(1.90)*	*(-1.66)*	*(-0.67)*	*(1.93)*
CashFlow*PercentBankers	-0.0696	-0.5090	0.4555	-1.2832	2.0453	0.2605	-1.9795
	(-0.14)	*(-0.86)*	*(0.61)*	*(-1.77)*	*(2.17)*	*(0.67)*	*(-1.74)*
LogTotalAssets	-0.0019	0.0024	-0.0026	-0.0004	-0.0034	0.0009	-0.0009
	(-1.25)	*(0.92)*	*(-1.37)*	*(-0.13)*	*(-1.21)*	*(0.32)*	*(-0.41)*
TobinsQ	-0.0014	0.0025	-0.0172	-0.0007	-0.0213	0.0035	-0.0142
	(-0.51)	*(0.85)*	*(-3.06)*	*(-0.30)*	*(-2.24)*	*(0.87)*	*(-1.71)*
Fixed Effects	Year, Industry	Year, Industry	Year, Industry	Year, Industry	Year, Industry	Year, Industry	Year, Industry
Test of equality of cross-effect (p-value)		30.97%		0.42%		5.56%	
Observations	1267	546	547	272	273	274	274

Table 2.7: The effect of bank representation on bank debt

For each of the 1,118 firm-years in our sample and for each of the 10 banks in our sample, we calculate *FirmBankDebt*, i.e. the debt (scaled by total assets) provided by this bank to this firm. The table presents results for Tobit regressions of *FirmBankDebt* on the dummy variable *ThisBankOnBoard,* which equals one if the bank for which *FirmBankDebt* has been calculated is represented on the board. The regression also contains the dummy variable *AnotherBankOnBoard,* which equals one if another bank is represented on the board, as well as seven additional variables that are described in Table 2.1. All dependent variables are lagged by one year. All regressions also contain a German GAAP dummy variable (not shown) that indicates whether the financial statements adhered to the local German accounting standard. For each dependent variable, the table displays the slope estimate and, in parentheses, the t-statistic of the two-sided test for zero slope. The t-statistics are based on robust standard errors with firm-year clusters.

	(1)	(2)	(3)	(4)	(5)
Lagged FirmBankDebt			0.9084	0.9060	0.7269
			(5.01)	*(4.98)*	*(4.55)*
ThisBankOnBoard	0.0146	0.0139	0.0186	0.0185	0.0037
	(8.45)	*(7.90)*	*(3.43)*	*(3.41)*	*(1.34)*
AnotherBankOnBoard	-0.0081	-0.0059	-0.0041	-0.0044	-0.0035
	(-5.93)	*(-3.81)*	*(-2.68)*	*(-2.94)*	*(-2.51)*
BankEquity	0.0130	-0.0152	0.0025	0.0020	0.0053
	(1.64)	*(-1.59)*	*(0.49)*	*(0.43)*	*(0.94)*
NonBankEquity	-0.0208	-0.0102	-0.0067	-0.0069	-0.0106
	(-7.57)	*(-3.09)*	*(-2.73)*	*(-2.63)*	*(-3.52)*
LogSales	0.0028	0.0069	0.0028	0.0030	0.0033
	(4.05)	*(3.68)*	*(4.33)*	*(4.70)*	*(4.43)*
CapEx	-0.0318	0.0152	-0.0173	-0.0120	-0.0146
	(-2.05)	*(1.15)*	*(-2.06)*	*(-1.33)*	*(-1.34)*
Intangibles	-0.0454	0.0138	-0.0163	-0.0145	-0.0209
	(-5.66)	*(2.01)*	*(-3.06)*	*(-2.53)*	*(-3.03)*
Volatility	0.0098	-0.0032	-0.0010	-0.0009	0.0014
	(1.89)	*(-1.06)*	*(-0.32)*	*(-0.30)*	*(0.40)*
InterestCover	-0.00011	-0.00004	-0.00004	-0.00005	-0.00006
	(-6.65)	*(-3.45)*	*(-3.37)*	*(-3.52)*	*(-3.87)*
InterestCover*ThisBankOnBoard	-0.00057	-0.00007	-0.00008	-0.00006	-0.00014
	(-4.20)	*(-0.65)*	*(-0.61)*	*(-0.51)*	*(-1.18)*
Fixed Effects	Year, Industry, Bank	Year, Firm, Bank	Year	Year, Industry	Year, Industry, Bank
Observations	11180	11180	11140	11140	11140
Uncensored observations	4501	4501	4490	4490	4490

Table 2.8: The effect of a bank's board representation on their lending activity to the same industry

For each of the 132 industry-years in our sample and for each of the 10 banks in our sample, we calculate *IndustryBankDebt*, i.e. industry-year average of the debt (scaled by total assets) provided by this bank to a firm in this industry-year. We only average across those firms where this bank is *not* represented on the board. The table presents results for four Tobit regressions of *IndustryBankDebt* on *PercentBankersThisBank*, which is the industry-year average of the percentage of supervisory board seats occupied by this bank. The regressions also contain the lagged values of six additional variables that are averaged across each industry-year and are identical for each bank. See Table 2.1 for a definition of these variables. For each dependent variable, the table displays the slope estimate and, in parentheses, the t-statistic of the two-sided test for zero slope. The t-statistics are based on robust standard errors with industry-year clusters.

	(1)	(2)	(3)	(4)
Lagged IndustryBankDebt		0.9130	0.9055	0.6845
		(21.38)	*(21.04)*	*(13.69)*
PercentBankersThisBank	0.0334	0.0735	0.0788	0.0255
	(1.17)	*(6.07)*	*(6.29)*	*(1.53)*
BankEquity	0.0196	-0.0103	-0.0035	0.0046
	(1.55)	*(-1.47)*	*(-0.35)*	*(0.44)*
NonBankEquity	-0.0026	-0.0001	0.0003	-0.0006
	(-0.92)	*(-0.07)*	*(0.15)*	*(-0.26)*
LogSales	0.0014	-0.0002	0.0021	0.0021
	(1.62)	*(-0.60)*	*(2.01)*	*(2.09)*
CapEx	0.0263	0.0035	0.0096	0.0152
	(1.84)	*(0.54)*	*(0.88)*	*(1.32)*
Intangibles	0.0014	-0.0033	0.0044	0.0028
	(0.16)	*(-1.04)*	*(0.64)*	*(0.38)*
Volatility	-0.0074	0.0033	0.0041	0.0008
	(-1.39)	*(0.61)*	*(0.90)*	*(0.17)*
Fixed Effects	Year, Industry, Bank	Year	Year, Industry	Year, Industry, Bank
Observations	1316	1315	1315	1315
Uncensored observations	885	884	884	884

Table 2.9: The effect of bank representation on mergers and acquisitions advisory

For each of the 700 firm-years in our sample in which a firm did at least one acquisition and for each of the 10 banks in our sample, we calculate *PercentAcqAdvisor*, i.e. the percentage of the acquisitions for which this bank was hired as an advisor. This table presents results for three Tobit regressions of *PercentAcqAdvisor* on the dummy variable *ThisBankOnBoard,* which equals one if the bank for which *PercentAcqAdvisor* has been calculated is represented on the board. The regressions include four additional independent variables that are described in Table 2.1. For each dependent variable, the table displays the slope estimate and, in parentheses, the t-statistic of the two-sided test for zero slope. For model (1), the t-statistics are based on robust standard errors with firm-year clusters.

	(1)	(2)	(3)
Sample	All banks	Deutsche Bank	Dresdner Bank
ThisBankOnBoard	0.6992	0.3194	0.3812
	(5.15)	*(2.49)*	*(2.45)*
LogSales	0.1209	0.1308	0.1073
	(3.48)	*(2.87)*	*(1.87)*
CapEx	0.0003	0.4693	-2.3788
	(0.00)	*(0.40)*	*(-1.03)*
Intangibles	1.0261	1.1282	0.4332
	(2.46)	*(2.49)*	*(0.85)*
Volatility	-1.0814	-1.2718	4.1932
	(-0.36)	*(-0.19)*	*(0.64)*
Fixed Effects	Year, Industry	None	None
Observations	7,000	700	700
Uncensored observations	52	32	15

Table 2.10: The effect of bank representation on payout ratio and volatility

The table presents results for OLS regressions with payout ratio and volatility as dependent variables. All explanatory variables are lagged by one year. All regressions also contain a German GAAP dummy variable (not shown) that indicates whether the financial statements adhered to the local German accounting standard. See Table 2.1 for a definition of all variables. For each explanatory variable, the table displays the slope estimate and, in parentheses, the t-statistic of the two-sided test for zero slope, based on robust heteroscedasticity consistent standard errors, which also allow for autocorrelation of one lag (Newey-West). Additionally, the p-value of the F-test for the equality of the coefficients on *PercentBankersWithoutEquity* and *PercentBankersWithEquity* is displayed.

	(1)	(2)	(3)	(4)	(5)	(6)
Dependent variable	Payout Ratio			Volatility		
Lagged dependent variable			0.5710			0.0217
			(16.96)			*(4.14)*
PercentBankersWithoutEquity	-0.0873	-0.1828	-0.0547	0.0042	0.0094	0.0003
	(-0.89)	*(-1.19)*	*(-0.76)*	*(1.05)*	*(1.97)*	*(0.15)*
PercentBankersWithEquity	0.0065	0.0741	0.0122	-0.0159	-0.0131	-0.0117
	(0.04)	*(0.47)*	*(0.10)*	*(-1.65)*	*(-1.16)*	*(-1.46)*
BankEquity	-0.2362	-0.0453	-0.1573	0.0143	0.0059	0.0068
	(-2.14)	*(-0.31)*	*(-1.62)*	*(1.61)*	*(0.63)*	*(0.94)*
NonBankEquity	0.0545	-0.0672	0.0335	0.0000	0.0005	-0.0017
	(1.55)	*(-1.30)*	*(1.32)*	*(-0.03)*	*(0.28)*	*(-2.20)*
LogSales	0.0126	0.0445	-0.0016	-0.0022	-0.0023	-0.0012
	(1.57)	*(2.04)*	*(-0.30)*	*(-8.78)*	*(-3.16)*	*(-4.89)*
CapEx	0.4717	0.4255	-0.0029	-0.0049	-0.0169	-0.0053
	(3.32)	*(2.30)*	*(-0.03)*	*(-0.86)*	*(-3.04)*	*(-1.17)*
Intangibles	0.0819	0.2303	0.0874	0.0039	-0.0028	-0.0004
	(0.87)	*(1.36)*	*(1.29)*	*(0.88)*	*(-0.65)*	*(-0.17)*
Volatility	-0.3624	-0.0946	-0.2609			
	(-3.17)	*(-1.63)*	*(-4.08)*			
Fixed Effects	Year, Industry	Year, Firm	Year, Industry	Year, Industry	Year, Firm	Year, Industry
Test of equality of PercentBankers with and without equity (p-value)	62.07%	19.39%	62.51%	6.13%	9.26%	15.93%
Observations	968	968	848	1159	1159	1130

Table 2.11: The effect of bank representation on management compensation

The table presents results for OLS regressions of *LogAvgManComp*, the logarithm of average management compensation as the dependent variable. All explanatory variables are lagged by one year. See Table 2.1 for a definition of all variables. For each dependent variable, the table displays the slope estimate and, in parentheses, the t-statistic of the two-sided test for zero slope, based on robust heteroscedasticity consistent standard errors, which also allow for autocorrelation of one lag (Newey-West). Additionally, the p-value of the F-test for the equality of the coefficients on *PercentBankersWithoutEquity* and *PercentBankersWithEquity* is displayed.

	(1)	(2)	(3)
Lagged LogAvgManComp			0.5082
			(7.96)
PercentBankersWithoutEquity	0.2392	-0.3396	0.1370
	(1.15)	*(-1.19)*	*(0.87)*
PercentBankersWithEquity	-0.2653	-0.9008	-0.5419
	(-0.78)	*(-1.86)*	*(-1.59)*
BankEquity	0.1186	0.0664	0.2887
	(0.50)	*(0.31)*	*(1.29)*
NonBankEquity	-0.3473	-0.4021	-0.2036
	(-4.53)	*(-3.58)*	*(-3.88)*
LogSales	0.2411	0.4024	0.1197
	(15.00)	*(3.43)*	*(6.96)*
TobinsQ	0.1161	0.1090	0.0566
	(4.31)	*(3.06)*	*(2.92)*
Intangibles	-0.0906	0.5237	-0.0559
	(-0.49)	*(1.91)*	*(-0.40)*
Volatility	0.1260	0.1130	0.0341
	(1.00)	*(1.28)*	*(0.42)*
Fixed Effects	Year, Industry	Year, Firm	Year, Industry
Test of equality of Percent-Bankers with and without equity (p-value)	19.84%	24.65%	6.10%
Observations	954	954	851

Table 2.12: The effect of bank representation on Tobin's Q

The table presents results for OLS regressions with the logarithm of Tobin's Q as the dependent variable. All explanatory variables are lagged by one year. All regressions also contain a German GAAP dummy variable (not shown) that indicates whether the financial statements adhered to the local German accounting standard. See Table 2.1 for a definition of all variables. For each dependent variable, the table displays the slope estimate and, in parentheses, the t-statistic of the two-sided test for zero slope, based on robust heteroscedasticity consistent standard errors, which also allow for autocorrelation of one lag (Newey-West).

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged LogTobinsQ					0.8017	0.7945
					(31.14)	*(30.91)*
PercentBankers	-0.5019	-0.5601	0.0497	0.1035	-0.1338	-0.1409
	(-4.31)	*(-5.35)*	*(0.58)*	*(1.19)*	*(-2.49)*	*(-2.68)*
BankEquity	-0.0967	0.0077	0.0073	0.0183	0.0138	0.0287
	(-0.97)	*(0.08)*	*(0.08)*	*(0.19)*	*(0.34)*	*(0.68)*
NonBankEquity	0.0184	0.0258	0.1114	0.1208	0.0116	0.0202
	(0.46)	*(0.66)*	*(2.50)*	*(2.73)*	*(0.60)*	*(1.04)*
LogTotalAssets	-0.0264	-0.0080	-0.1092	-0.1088	0.0008	0.0032
	(-2.41)	*(-0.81)*	*(-3.91)*	*(-3.76)*	*(0.17)*	*(0.74)*
CapEx	0.4094	0.3879	0.6703	0.5331	0.0264	0.0099
	(2.02)	*(1.90)*	*(3.18)*	*(2.99)*	*(0.18)*	*(0.08)*
Intangibles	-0.1678	0.1818	-0.2575	-0.2054	-0.0395	-0.0157
	(-1.23)	*(1.20)*	*(-1.70)*	*(-1.35)*	*(-0.61)*	*(-0.23)*
Volatility	-0.0661	0.0037	0.0143	0.0138	-0.0936	-0.1000
	(-0.66)	*(0.04)*	*(0.27)*	*(0.25)*	*(-2.17)*	*(-2.19)*
LeverageBook		-0.4539		0.0075		-0.0583
		(-6.72)		*(0.13)*		*(-2.05)*
Productivity		0.0001		0.0005		0.0000
		(2.09)		*(6.75)*		*(-0.61)*
SalesGrowth		-0.0006		-0.0055		-0.0025
		(-0.05)		*(-1.89)*		*(-1.25)*
R&D		1.8339		0.8161		0.4862
		(3.75)		*(1.25)*		*(2.02)*
Fixed Effects	Year, Industry	Year, Industry	Year, Firm	Year, Firm	Year, Industry	Year, Industry
Observations	1115	1102	1115	1102	1104	1101

Table 2.13: The effect of bank representation on ROA

The table presents results for OLS regressions with ROA as the dependent variable. All explanatory variables are lagged by one year. All regressions also contain a German GAAP dummy variable (not shown) that indicates whether the financial statements adhered to the local German accounting standard. See Table 2.1 for a definition of all variables. For each dependent variable, the table displays the slope estimate and, in parentheses, the t-statistic of the two-sided test for zero slope, based on robust heteroscedasticity consistent standard errors, which also allow for autocorrelation of one lag (Newey-West).

	(1)	(2)	(3)	(4)	(5)	(6)
Lagged LogTobinsQ					0.5224	0.5765
					(6.46)	*(9.75)*
PercentBankers	-0.0720	-0.0771	-0.0312	-0.0393	-0.0379	-0.0297
	(-2.73)	*(-3.03)*	*(-0.76)*	*(-1.12)*	*(-1.93)*	*(-1.57)*
BankEquity	0.0045	-0.0215	0.1265	0.0646	0.0185	-0.0324
	(0.11)	*(-0.57)*	*(1.51)*	*(1.01)*	*(0.46)*	*(-0.84)*
NonBankEquity	0.0035	-0.0020	0.0069	0.0005	0.0030	0.0010
	(0.38)	*(-0.22)*	*(0.43)*	*(0.03)*	*(0.43)*	*(0.16)*
LogTotalAssets	-0.0058	-0.0010	-0.0173	-0.0129	-0.0020	-0.0002
	(-2.44)	*(-0.47)*	*(-1.51)*	*(-1.00)*	*(-1.17)*	*(-0.11)*
CapEx	0.1172	0.1395	0.1349	0.1444	0.0128	0.0315
	(2.72)	*(3.32)*	*(2.76)*	*(3.07)*	*(0.40)*	*(1.01)*
Intangibles	-0.0575	-0.0010	-0.0278	0.0094	-0.0414	-0.0173
	(-1.99)	*(-0.03)*	*(-0.66)*	*(0.22)*	*(-1.95)*	*(-0.78)*
Volatility	-0.0308	-0.0194	0.0195	0.0146	-0.0137	-0.0203
	(-1.22)	*(-0.84)*	*(1.00)*	*(0.75)*	*(-0.71)*	*(-1.02)*
LeverageBook		-0.0990		-0.0379		-0.0342
		(-6.60)		*(-1.69)*		*(-2.79)*
Productivity		0.0000		0.0001		0.0000
		(3.07)		*(3.98)*		*(1.22)*
SalesGrowth		0.0019		0.0005		0.0006
		(0.55)		*(0.33)*		*(0.37)*
R&D		0.0258		-0.0509		-0.0142
		(0.21)		*(-0.30)*		*(-0.17)*
Fixed Effects	Year, Industry	Year, Industry	Year, Firm	Year, Firm	Year, Industry	Year, Industry
Observations	1124	1106	1124	1106	1119	1106

Chapter III

How Preussag Became TUI: A Clinical Study of Institutional Blockholders and Restructuring in Europe

> Many managements apparently were overexposed in impressionable childhood years to the story in which the imprisoned handsome prince is released from a toad's body by a kiss from a beautiful princess. Consequently, they are certain their managerial kiss will do wonders for the profitability of the target company. We've observed many kisses but very few miracles. Nevertheless, many managerial princesses remain serenely confident about the future potency of their kisses even after their corporate backyards are knee deep in unresponsive toads.
>
> Warren Buffet, Berkshire Hathaway Annual Report 1981

1 Introduction

At the beginning of fiscal year 1993/94, Preussag's sales were 4% in logistics, 4% in information technology, and 92% in "old economy" lines of business, including metal trading, steel, mining, shipbuilding, and plant construction.[49] At the end of 2004, tourism accounted for 73%, logistics for 19%, and nine of the ten "old economy" segments as well as information technology were gone. Moreover, the company had now relabeled itself "TUI AG," and only the identities of its CEO, its chairman of the supervisory board, its largest shareholder, and the registration code of its stock preserved continuity. From 1994 to 2004, the stock gained 9% while the market index rose by 71% and an industry-weighted portfolio by 115%. We track Preussag's history and the fate of its stock and analyze its 47 acquisitions and 46 divestitures

[49] This chapter is based on joint work with Ingolf Dittmann and Ernst Maug, therefore I retain the personal pronoun "we", used in the original paper, throughout this chapter. An abridged version of this chapter was published in *Financial Management* 37:3, pp. 571-598. All tables and figures are gathered at the end of the chapter. This is an academic study and was written only to make a contribution to the scientific debate on corporate governance. The authors did not conduct the study on behalf of a third party and none of the authors received any funds from any party mentioned in this paper. We also did not receive any information or communications from Preussag's management. We are grateful to Michel Habib, Martin Wallmeier, an anonymous referee, and the jury members of the JFE ECGI Clinical Paper Competition, especially Steve Kaplan and Claudio Loderer, for their comments. Christoph Schneider acknowledges the support of a DekaBank scholarship.

as well as other transactions and news events. We find that Preussag's divestiture program was a success and added significant shareholder value. However, the investment of divestiture proceeds into tourism was misguided: Preussag lost value by investing in an industry it did not understand and, ultimately, by overpaying for assets to which it could not add any value. Or, extending Warren Buffet's famous parable, as Preussag kissed too many toads that failed to turn into princes, it ultimately became a rather unattractive toad itself.

This chapter asks what went wrong in the process that turned Preussag, a traditional diversified conglomerate, into TUI, a modern and focused services company. In the process, we suggest some general conclusions about corporate governance, acquisition programs, incentives for voluntary liquidations, and the potentially ill-fated role of institutional shareholders.

We analyze three phases of Preussag's development:

Phase 1: From January 1, 1994 to June 10, 1997, Preussag's strategy was to restructure its core lines of business, expand the profitable segments and divest everything that was not profitable. This strategy looked promising initially but then delivered less than expected, and the stock lost 25.0% relative to the market index.

Phase 2: On June 11, 1997, Preussag bought Hapag-Lloyd, a company in container shipment, luxury cruises, airlines, and travel agencies. From then on until September 11, 2001, Preussag undertook altogether 16 acquisitions in tourism and divested most of its former lines of business. During this period, Preussag outperformed the market index by 29.6%.

Phase 3: Beginning with the terrorist attacks on September 11, 2001, tourism went through a number of crises that marked a structural shift in the industry. Preussag slowed down its acquisitions and consolidated its tourism and logistics operations. Most restructuring was internal during this period, and the stock underperformed the market by 38.4% until December 31, 2004.

Our main focus is on the second phase where Preussag entered tourism, as it presents the key to understanding the turnaround in the company's strategy. We group transactions into several categories, including "tourism acquisitions," "other acquisitions," and "sell-offs." We also analyze "tourism news" and "other news," mostly financial disclosures. We then conduct an analysis of variance of Preussag's stock return in order to distinguish the impact of different categories of news and announcements on the stock price. We also adapt event study methods to our problem. Our main findings are:

- The positive performance in Phase 2 is explained entirely by Preussag's divestiture program. Divestitures themselves explain an outperformance relative to the stock market of 48%.[50]
- The positive impact of divestitures hides the value destruction through tourism acquisitions. These reduced the stock price by 35% relative to the index.
- The crises affecting tourism in Phase 3 cannot explain the underperformance of Preussag during this time.

We then calculate the value Preussag would have had if it had divested all its traditional businesses but not acquired any tourism companies. Had Preussag invested the proceeds from its sell-offs into a tourism and logistics *index*, rather than into tourism and logistics *companies*, then its shareholders would have almost tripled their wealth to more than €11 billion rather than seeing it reduced to €3.3 billion.

Preussag followed a strategy of "business migration" that only few other firms have followed before.[51] The remarkable feature of Preussag remains the speed of their transformation, which

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[50] This and the following number measure performance relative to an index in logarithmic returns and refer to the calculations in Section 4.

[51] Besanko, Dranove, and Shanley (2000) cite the example of American Can, a maker of tin cans and metal containers, that became Primerica, a financial services company that acquired the U.S. business of Barclays Bank and Smith Barney. Others include U.S. Steel that became USX when it added oil to its steel business (without divesting steel), and International Harvester, a farm equipment manufacturer in the 1930s and 1940s, that became the truck manufacturer Navistar today (see Besanko, Dranove, and Shanley, 2000, pp. 200-201).

mostly happened, between 1997 and 2001. Our analysis shows that this strategy consistently destroyed large amounts of shareholder value and raises the question why such a strategy could be followed over an extended period of time without any interference by shareholders. We study Preussag's corporate governance and find that compensation was practically unrelated to performance and did not provide incentives for a voluntary liquidation of the company. Rather, compensation increased substantially as Preussag was transformed into Europe's largest tourism company. We also document that this strategy created significant private benefits in the form of increased status for Preussag's CEO as he accumulated seats on other companies' boards. At the first glance, a better alignment of management's and shareholder's interests could have been expected as Preussag had an independent supervisory board and a large controlling shareholder. However, it turns out, however, that the large shareholder was an intermediary – a state-owned bank – whose management had little incentive to prevent the destruction of shareholder value. This bank commanded almost complete control over Preussag through its voting power and interlocking directorates.

Our discussion of corporate governance and the causes of value destruction brings out four general points: (1) Managerial discretion is not limited to free operating cash flows, but also includes the (potentially much larger) proceeds from divestitures; (2) Large shareholders are a mixed blessing if they are institutions that suffer from agency problems themselves; (3) Compensation is critical to induce value-enhancing, voluntary liquidations; (4) Independent supervisory boards lose their bite in networks of cross-holdings and board interlocks.

The chapter is structured as follows. Section 2 presents the details of the history of Preussag and background information on the major players. Section 3 introduces our data and the method of analysis. Section 4 contains the main results of our empirical analysis. Section 5 is devoted to an analysis of what went wrong at Preussag and puts the case into a larger context.

Section 6 summarizes the reaction of Preussag's management to our results, and Section 7 concludes.

2 Background and stock price history

2.1 History of Preussag

Preussag's history dates back to 1924, when the "Preussische Bergwerks- und Hütten-Aktiengesellschaft" took over state-owned amber operations in Königsberg, turning Prussian civil servants into entrepreneurs.[52] The first step towards privatization was taken with the 1959 IPO and the name changed to Preussag AG in 1964. Acquisitions in the 1960s created a diversified conglomerate with engagements in logistics, mining, oil exploration, metal production, and trading. In 1989, Preussag took over Salzgitter AG, a state-owned company in steel, shipbuilding, and engineering, creating a corporation with more than 70.000 employees.

Insert Table 3.1 here

Table 3.1 provides data on Preussag's sales by segment and shows that in fiscal year 1992/93, their largest segment by revenues was trading (trading in steel and non-ferrous metals), which together with the related logistics operations accounted for 40% of sales.[53] Plant construction with altogether 13 different activities (including nuclear power plants, civil engineering, underground engineering) prospered at this time because of the construction boom after German unification. Steel production was the third largest segment with 10.4% of sales. The Herfindahl index that measures the degree of diversification is 0.18 for this fiscal year, describing a moderately diversified conglomerate.

2.2 Preussag's main shareholder: WestLB

The major shareholder of Preussag during the entire period under consideration here is the Westdeutsche Landesbank Girozentrale (WestLB), who owned 29.1% directly and another

[52] The name can be translated as "Prussian Mining and Steel, Inc."; Königsberg is now Kaliningrad, Russia.
[53] We do not have earnings figures by segment. German GAAP requires segment reporting for sales only.

approximately 3.5% indirectly through their 33.3% stake in Niedersachsen Holding. WestLB was important for Preussag not only as its major shareholder but also through its portfolio of industrial holdings, especially in tourism. This becomes apparent from Figure 3.1A, which describes the major blockholdings in the Preussag-WestLB-network in 1994 that remained almost unchanged until June 1997.

Insert Figure 3.1 here

WestLB is the fourth largest German bank by assets and also the largest state-owned bank in the country with its main regional focus in the state of North Rhine-Westphalia.[54] The original purpose of WestLB was to assist small local savings banks to coordinate their liquidity. These savings banks are community owned and were founded to provide affordable banking services to small and medium size businesses and less well-off households. In addition, WestLB is a major lender to the state and to the communities of North Rhine-Westphalia. The owners of WestLB, the state of North Rhine-Westphalia and a number of communities, guarantee for all liabilities of the bank. In the 1960s, WestLB began to extend its scope and started to assemble a portfolio of stakes in German companies. Over subsequent decades, these included Preussag, Babcock and a number of major tourism companies (see Figure 3.1A). In the 1980s and 1990s, WestLB expanded into investment banking and leasing and built up a worldwide network of branches. WestLB made headlines in 2003 when its London branch lost about €500 million in a deal with the U.K. based TV rental company Boxclever.

2.3 Phase 1: Consolidate core businesses (1994-1997)

On January 1, 1994 Michael Frenzel, already a member of the management board for six years, became CEO of Preussag. During the first three years of his leadership, Preussag followed a strategy described as "value-oriented development." Its key focus was to "extend Preussag's core competencies in plant engineering and construction and technological ser-

[54] Handelsblatt, December 3, 2001, p. 21. We rely on Handelsblatt for most of our company information. It is a German business daily newspaper with detailed company reports.

vices." (Preussag, Annual Report 1993/94, p. 9). This strategy comprised the following parts: (1) Identify three segments for growth, (2) retain "core segments" with more limited growth prospects but sufficient profitability, (3) divest segments that have no potential for growth and are not profitable, and (4) accelerate internationalization by expansion into the Asian-Pacific region as margins in Western Europe stagnate. Following this strategy, Preussag sold the Hagenuk group, a manufacturer of mobile phones that suffered severe losses, and exited from railcar manufacturing. Apart from these segments, the relative weights of the other segments within the company did not change much until fiscal year 1996/97. Preussag undertook 11 acquisitions and 14 sell-offs from January 1994 to June 1997.

Insert Figure 3.2 here

Figure 3.2A displays Preussag's stock price for this period. The figure shows the performance indices of Preussag's stock and of the CDAX, so dividends are always reinvested. The CDAX represents a value-weighted portfolio of all German corporations traded on the Frankfurt stock exchange. During most of the first phase, where Preussag's management tried to re-structure their old economy businesses, the stock price tracked the development of the index closely, with some divergence becoming apparent in the second half of 1996. As of 1997, the German stock market index started a strong ascent, in line with other markets worldwide, which Preussag's stock followed only partially. Over the first phase until June 10, 1997, Preussag's stock increased by 27.6%, which is 25% less than the CDAX performance over the same time period. Our analysis needs to address the question why Preussag underperformed the index in this phase.

2.4 Phase 2: Enter tourism (1997-2001)

On June 11, 1997, Preussag bid for Hapag-Lloyd AG and opened a new chapter in the company's history. Hapag-Lloyd celebrated its 150th anniversary in the same year, which they dated to the foundation of the "Hamburg-Amerikanische Packetfahrt-Actien-Gesellschaft"

(short “Hapag”) in 1847, which had opened its North Atlantic service (Hamburg-America-Line) in 1848. Its main focus is in global container shipping, airlines, travel agencies, and luxury cruises, four areas entirely unrelated to Preussag’s traditional lines of business. Hapag-Lloyd was publicly listed but its free float was less than 1% of its shares. Hapag-Lloyd also owned a 30% stake in TUI, which was a tour operator independent of Preussag (see Figure 3.1A).

With this takeover, Preussag entered the German tourism market that consisted of three main segments: tour operators, travel agencies and charter airlines. An integrated European tourism industry did not exist at that time. The tour operator market had a volume of about €15.6 billion in 1997 and had grown at an annual rate of almost 9% since 1990. This market was highly concentrated at the time with the three major players being TUI (market share: 26%), C&N (22%) and LTU (12%). The German travel agency market grew by an annual 7.3% between 1990 and 1998 and reached a sales volume of about €22.5 billion in 1997. During the previous decade, the concentration in this segment had increased dramatically but was still only moderate. As a consequence of the aggressively expanding travel agency chains and the entry of new competitors, average industry return on sales decreased significantly from 10.1% in 1993 to 3.3% in 1996. The three major players in this market are Hapag-Lloyd, First and C&N with a combined market share of about 20%. Finally, the charter flight market was also a fast growing segment during the 90’s because of the increasing popularity of overseas holidays. Like the tour operator segment, this market is an oligopoly where the three major airlines are Condor/C&N (24%), LTU (24%) and Hapag-Lloyd (16%). Clearly, the features of tourism as a growing market and the perceived general shift of the economy from manufacturing towards services made it look attractive compared to the stagnating, cyclical, and often loss-making traditional businesses Preussag operated before.

During this period, Preussag undertook 26 acquisitions (16 of which were in tourism) and 15 divestitures, mostly of its traditional lines of business. As a result, Preussag became more focused, and its degree of diversification fell significantly over this period. The Herfindahl index based on sales reached 0.38 in 2001, almost double the average value during 1994-1997. At the same time, WestLB disengaged from tourism, selling most of it to Preussag. Figure 3.1B depicts the ownership and cross-shareholdings at the end of 1999. The comparison to Figure 3.1C shows how acquisitions and divestitures disentangled this network in subsequent years.

Insert Figure 3.3 here

Figure 3.2B shows that Preussag's stock appreciated by 44.8% over this period (until September 10, 2001), whereas the market as a whole rose by only 15%. A potential explanation for this superior performance is that Preussag is just a high-beta stock that profited from the general rise in markets. Figure 3.3A disproves this conjecture. The chart shows the development of Preussag's beta from 1994 to 2004 measured over a moving 500 trading day window. This beta is highest at the beginning and at the end of the period (close to 1.0), but low in the middle phase between 1997 and 2001, where it falls into the 0.6-0.8 range. Hence, Preussag outperformed the market while moving its field of operations from "old economy" towards tourism. We therefore have to address the question why Preussag outperformed the market and whether this can be interpreted as an endorsement of its business model by the stock market.

2.5 Phase 3: Consolidate tourism (2001-2004)

After the terrorist attacks on September 11, 2001, tourism suffered a general setback. Subsequent events like the war in Iraq and the SARS epidemic in Asia reinforced these problems for many tourism companies. We therefore separate this third phase from the previous phase. After September 11, 2001, Preussag scaled back its acquisition program and undertook only

10 smaller acquisitions (nine in tourism) and continued to exit from its previous lines of business with a total of 17 divestitures. Their efforts were focused on consolidating and restructuring their tourism business. At the end of 2004, almost three-fourths of their sales came from tourism and another 19% from logistics, raising the Herfindahl index for diversification to 0.58.[55]

Figure 3.2C shows that Preussag's stock price fell by 11% by the close of trading on September 11 in Frankfurt. While the CDAX fell in line with other stock markets, the decline for Preussag was sharper, underperforming the index by more than 20% within the first ten days of the attacks. However, the CDAX subsequently started a sustained recovery, finishing 2004 at 97% of its value on September 10, 2001, whereas Preussag ended 2004 at less than 60% of its value on that day. Preussag's beta increased after 2000 to values around 1.0, so this cannot explain why Preussag declined more than the market. Preussag's low stock price nearly led to its exclusion from Germany's major stock index, the DAX in 2004. It also led to takeover speculations when Morgan Stanley raised its stake in Preussag to 10% in July 2004, and WestLB repeatedly expressed its interest to sell its 31.4% stake in Preussag. In December 2004, WestLB sold a 10% stake to a Spanish investor who is reportedly a close friend of Preussag's CEO Michael Frenzel. The remaining WestLB shares were placed with other Spanish investors and with European institutional investors. In Section 4.3 we investigate what caused the spectacular collapse of Preussag's stock price over Phase 3. Was it just bad luck from an unforeseeable negative shock that was entirely outside management's control as managers claimed?[56] Or did the market – belatedly – recognize the problems of Preussag's concept of an integrated tourism company?

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55 Preussag changed its name to TUI, its former tourism subsidiary, on June 26, 2002, towards the end of the period under consideration here. Throughout the text, we still refer to the company as Preussag and ignore the change of name in order to avoid confusion.

56 Preussag, Annual Report 2003, p. 107. We refer to annual reports by fiscal year, not by publication date. For example, Preussag's annual report for the fiscal year 1994/95 was published in 1996.

3 Data and methods

3.1 Data

In order to collect a complete set of transaction announcements and news we searched for "Preussag," "TUI," and "Hapag-Lloyd" in five different databases. (1) The Genios Business database, which includes several major German newspapers and business periodicals;[57] (2) DGAP, a service that collects disclosures to regulators;[58] (3) The press release database of TUI AG available from their website; (4) For the years 2003 and 2004 we also had access to Lexis-Nexis and searched this database for "TUI".[59] Whenever we identified a transaction in any of these databases, we verified the names of acquirer and target with the Genios Business database. We also downloaded all transactions from Thomson Financial SDC where these companies appear either as target or as acquirer, but we found this database to be particularly unreliable.[60] We therefore deleted all events from Thomson Financial that could not be confirmed from one of the other sources. These were only small and probably insignificant transactions, so we feel confident that this decision does not bias our results but that it significantly enhances the accuracy of our data.

As a general rule, we assume that disclosures to the market happened one trading day before the publication date of the newspaper. For electronic disclosures we use the same day. In those cases where there is clear evidence (time stamp) that the news did not reach the market before the close of trading, we assign the event day to the subsequent trading day. We cannot exclude the possibility that we miss the correct event date by one trading day in some in-

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57 These include the Wall Street Journal Europe, Handelsblatt, the M&A Review, Tagesspiegel, Wirtschaftswoche, VDI Nachrichten, Der Spiegel, and Die Zeit.

58 DGAP is "Deutsche Gesellschaft für Ad-hoc Publizität mbH" and collects the disclosures to BAFIN (Bundeaufsichtsamt für das Wertpapierwesen), the German financial regulator (equivalent to the SEC in the U.S. or the FSA in the U.K.).

59 Lexis-Nexis includes the Financial Times, Financial Times Deutschland, Börsen-Zeitung, Süddeutsche Zeitung, Die Welt, Frankfurter Allgemeine Zeitung, and Frankfurter Rundschau.

60 In many cases, the announcement date was confused with the effective date. In several other cases, the announcement date was the publication date of the newspaper article even though exact time and date stamps for disclosures or company press releases existed. In more than 35% of the cases, we had to correct the announcement date because it was evidently incorrect. This database was also highly incomplete.

stances. We also searched the Genios Business database for news articles and press releases on industry news relevant to Preussag's businesses. In total, we can identify 125 transaction announcements and 292 news items that we retain in our data set, a total of 417 events.

We classify all announcements into the following five groups: tourism acquisitions, other acquisitions, sell-offs, tourism news, and other news. Whenever some ownership is transferred, we classify an announcement as an acquisition or a sell-off – irrespective of the percentage of ownership transferred in the transaction. Joint ventures to which Preussag mainly contributed cash and Preussag's partners contributed assets are classified as acquisitions. On the other hand, we regard the announcements of strategic alliances and joint ventures where Preussag does not contribute cash as a news item. Announcements of internal restructurings are also considered news items. Note that some transactions generate multiple announcements if they are executed in stages or if different pieces of news reach the market on different days. In total, we identify 62 announcements of 46 sell-offs and 63 announcements of 47 acquisitions, of which 25 were in tourism. Of the 292 news items, 44 regard tourism. Most of the others are disclosures of financial statements of Preussag and its subsidiaries.

We obtain stock market data from Thomson Financial Datastream. We choose the CDAX as the relevant market index. The CDAX represents a value-weighted portfolio of all German corporations traded on the Frankfurt stock exchange. All time series were adjusted for German holidays without stock market trading in order to avoid an underestimation of the excess returns' variance. Stock returns were calculated from the return index, which includes reinvested dividends.

3.2 Methods

In order to test our hypotheses and to address our questions, we analyze Preussag's stock price reaction in two different ways: (1) with a regression of Preussag's returns on dummy variables, and (2) with an adaptation of standard event study methods. For our analysis, we

use log returns, because log returns are additive over time and facilitate the attribution of returns to classes of events.

3.3 Choice of benchmarks

For both methods, a benchmark for the normal or expected performance must be chosen first. For Preussag, this turns out to be a major methodological problem, because the correlation of Preussag's shares with the market index varies markedly over time as Figure 3.3A demonstrates. Even within each of the three subperiods we defined above, Preussag's CAPM beta is not constant. On the other hand, 417 events in 11 years render it impossible to find enough 'clean' estimation windows for estimating the model separately for each event. We therefore work with the market-adjusted model and simply deduct the market return (CDAX) from Preussag's return in order to arrive at Preussag's abnormal return. Brown and Warner (1985) show in a simulation study that the size and power of tests based on the market-adjusted model are only marginally worse than tests based on the market model.

We also employ an industry-adjusted model, where we subtract the return on an appropriately weighted industry index from Preussag's returns when calculating Preussag's abnormal returns. This industry-adjusted model helps us distinguishing between industry effects and firm-specific effects, because industry effects do not 'wash out' as in standard event studies based on firms from many industries. Since Preussag's activities moved more and more from steel and engineering towards tourism and logistics, we construct two industry indices: The steel and engineering index is an equally weighted portfolio of the *FTSE Europe steel and other metals* index and the *FTSE Europe engineering and machinery* index. The tourism and logistics index is an equally weighted portfolio of the *FTSE Europe leisure and hotels* index and the *FTSE Europe transport* index. Figure 3.3B displays the coefficients of a regression of Preussag's daily returns on the corresponding returns of these two indices and an intercept where the regression is performed over a moving 500 trading day window. Both series start in

January 1995, because the FTSE Europe indices are not available before January 1994. The plot demonstrates that the correlation between Preussag's returns and the returns on the tourism and logistics index steadily and markedly increases over the period considered while the correlation with the steel and engineering index decreases. The plot therefore reflects the transformation of Preussag from a steel and engineering conglomerate to an integrated tourism and logistics service provider.

As Preussag gradually moves from one industry to another, we construct a weighted industry index for use in the industry-adjusted model. A similar approach has been used by Parrino (1997). We weight the 'steel and engineering'-index and the 'tourism and logistics'-index with the total assets of each segment according to the most recent balance sheet.[61] The weight on 'tourism and logistics' rises steadily from 3.1% in 1994 to 97.6% in 2004.

3.4 Regression approach

For each of the three time periods, we regress the daily abnormal returns AR_t on an intercept and on up to six dummy variables $D_{i,t}$ that are set equal to one for every day t within the event window for an event of type i. So if type 1 represents sell-offs, the event window is (-1, 0), and a sell-off was announced on day τ, then $D_{1,\tau-1} = D_{1,\tau} = 1$. The regression equation is:

$$AR_t = \hat{\alpha} + \sum_{i=1}^{6} \hat{\beta}_i D_{i,t} + \hat{\varepsilon}_t \qquad (3\text{-}1)$$

Here $\hat{\alpha}$ and the $\hat{\beta}$'s are estimates of the regression coefficients and $\hat{\varepsilon}_t$ the OLS residuals. This regression approach has been widely used in the literature. (See Binder, 1985, for a comparison with the standard event study method.) In the context of a clinical study, the regression approach has been used by Bittlingmayer and Hazlett (2000). By summing equation (3-1) over all observations t, we obtain:

[61] We could not obtain total assets for segments prior to September 30, 1998, so we use sales as a weight before that date. We use sales numbers excluding intra-company sales for computing these weights. These sales figures differ from those reported in Table 3.1 where intra-company sales are included.

$$\sum AR_t = n\hat{\alpha} + \sum_{i=1}^{6} n_i \hat{\beta}_i \,, \tag{3-2}$$

where n is the number of observations used in the regression and n_i is the number of observations for which the dummy variable D_i equals one, i.e. $n_i = \sum D_{i,t}$. Note that the sum of the residuals $\hat{\varepsilon}_t$ is zero as these are OLS residuals. In Tables 3.2, 3.4, and 3.6, we report the cumulative effects $n_i \hat{\beta}_i$ rather than the average effects $\hat{\beta}_i$, because we want to quantify the total impact of the different components of Preussag's strategy.

3.5 Event study approach

Our second approach is based on standard event study methods. We calculate cumulative abnormal returns (CARs) for a small event window around each event individually and then add the CARs of events of the same type (sell-offs, tourism acquisitions, etc.) in order to test more general hypotheses. We use the same classes as in the regression analysis.

As we consider 417 announcements during a total of 2,775 trading days, we naturally encounter overlapping event windows and even multiple events per day. When we add up cumulative abnormal returns across events within one class, such overlaps become a serious methodological problem. We address this problem by introducing "multiple events" and "no events" as additional classes. After putting the event windows around the individual events, we assign each trading day to exactly one class. Each day that belongs to two or more event windows of different classes is assigned to the class "multiple events." All other days that fall into one of the event windows are assigned to the class of the respective event. Finally, each day that does not belong to any event window is classified as "no events." From the days in the "no events" class, we calculate the standard deviation of abnormal returns used for significance tests. In order to conserve space, we report our event study results only for Phase 2, which is the key time period in our analysis. The results of the event study approach and the regression approach are very similar.

4 Analysis and evaluation

4.1 Phase 1: Consolidate core businesses (1994-1997)

The first three and a half years of Michael Frenzel's tenure at the helm of Preussag are marked by his attempt to turn the company around through a restructuring program described as "value-oriented development."

Insert Table 3.2 here

Table 3.2 contains the regression results from equations (3-1) and (3-2) for this period. The table displays the part of the total abnormal return that can be explained by three event groups: acquisitions, sell-offs, and news. Results are presented for four different event windows and two choices of the benchmark index. The main findings from Table 3.2 are robust to the different test specifications. Abnormal returns in all transaction categories are small and statistically and mostly also economically insignificant. Only the 67 news announcements – with one exception all disclosures of financial statements about Preussag and its subsidiaries – are highly significant and negative. Altogether, it seems that the decisions of Preussag's management during the period 1994-1997 held little surprise for the stock market. However, financial disclosures were mostly negative and resulted in a cumulative underperformance of 22% to 43% over the whole period.[62] Hence, Preussag consistently surprised the market with less than expected financial performance.

As Preussag outperformed the market for the whole of 1994 by 12.0% (actual return), we conclude that the stock market initially subscribed to Preussag's concept of a "value oriented" restructuring, and the transactions of the company were clearly geared towards this goal. Then the market slowly and steadily absorbed the less than promised impact of this strategy as it became reflected in Preussag's financial performance and completely lost heart in 1996: during that year, Preussag underperformed the CDAX by 58.4% (actual return). From this per-

[62] All returns given in Sections 4.1 through 4.3 are log returns if not stated differently.

spective, it is not surprising that Preussag's management began to rethink its strategy at the beginning of 1997.

4.2 Phase 2: Enter tourism, exit core businesses (1997-2001)

The second phase begins on June 11, 1997, when Preussag confirmed previous rumors that it bid for Hapag-Lloyd. This event marked a turning point, as tourism now became a major part of the company's activities, accounting for 28% of sales in fiscal year 1997/98, and for 57% in fiscal year 2001 (see Table 3.1).

Insert Table 3.3 here

Table 3.3 lists abnormal returns and short descriptions for the main events during phase 2 of our analysis. The first rumors regarding Preussag's intention to buy Hapag-Lloyd circulated already on May 27 without moving the stock price. The announcement of the takeover itself on June 11 led to a statistically insignificant increase of Preussag's share price. The final price of €532 per share – a 14% premium on the pre-announcement price – was announced only after negotiations concluded and became public on September 2, which led to a significant decline in Preussag's stock. It is therefore difficult to discern from this an unambiguous reaction of the stock market to Preussag's change of strategy, and the negative reaction to the last announcement may well imply that Preussag simply overpaid. It is certainly not clear how Preussag could justify a 14% premium for the purchase. As recently as 1996 Preussag had argued that its core competencies were in logistics, steel, and oil (Annual Report 1994/95, p. 9). Now they announced the transformation of the company into a "modern services company" (press statement dated September 3, 1997).

Hapag-Lloyd also owned 30% of the tour operator TUI (Touristik Union International) and Preussag's CEO was quoted in the press on June 12, a day after announcing the bid for Hapag-Lloyd, that they were also interested in acquiring another 30% stake from WestLB in order to obtain majority control. Clearly, the Hapag-Lloyd takeover set the stage for a

stronger engagement in tourism and services. Industry observers, including the federal cartel office, Germany's antitrust regulator, perceived the emergence of a duopoly for the German holiday market with Preussag, Hapag-Lloyd and LTU on one side, and C&N with its holdings Condor and NUR as their only main competitor on the other side. The later purchases of the other TUI stakes from Deutsche Bahn, the state-owned German railway operator, and the Schickedanz group (see Table 3.3) was probably anticipated by the market and did not cause significant movements of Preussag's stock price.

With the acquisition of Thomas Cook, a large British tour operator, travel agency chain and financial service provider, Preussag's expansion into tourism reached an international dimension. On October 9, 1998, the press reported rumors about Preussag's ambitions to buy Thomas Cook for the first time. At that time, Thomas Cook planned to merge its activities with the British interests of U.S.-based Carlson Companies, Inc. The decision became official only in December, but evidently the stock market took this announcement seriously and reacted enthusiastically with the CAR measured over the (0, 2) event window reaching 9%. The staged acquisition of Thomas Cook from WestLB (a 24.9% stake in December 1998, followed by another 25.2% in September 1999) itself did not cause the stock price to move. So evidently in this case, the purchase price was more in line with the market's expectations in this case. The reaction to the first announcement suggests either that the market endorsed Preussag's move into tourism at this time, or that WestLB sold Thomas Cook to Preussag for too low a value. WestLB is not listed, so we can only look at the return to this investment for Preussag as they sold Thomas Cook at a premium in December 2000. The internal rate of return from their investment is 74% when the stock market gained only 23% over the same period.[63] This favors the hypothesis that WestLB sold Thomas Cook to Preussag at a discount.

[63] Preussag paid €146 million for the first stake on December 23, 1998 (M&A Review, 2/1999, p. 101) and €147 million for the second stake by exercising their purchase option on September 30, 1999. They sold all their holdings on December 5, 2000 for €461 million (Handelsblatt, December 8, 2000, p. 22).

In 2000, Preussag increased their engagement in the U.K. and consolidated their investment in tourism by purchasing Thomson Travel Group plc, the largest U.K. tourism group. Before Preussag became interested, Thomson Travel had been engaged in negotiations with C&N about a merger during April 2000. C&N had bid first 130 pence and then 145 pence per share for Thomson Travel, which put a price tag of €2.42 billion on Thomson Travel. On April 12, 2000, Frenzel discussed this development at Preussag's annual general meeting and described this price as "extremely high." He expressed "no interest" at the time and said Preussag's attitude to this regrouping of their competitors as "extremely relaxed." Exactly one month later, on May 15, 2000, C&N had increased its bid to 160 pence per share (€2.67 billion) when Preussag announced that it would top the C&N-offer with a spectacular 180 pence per Thomson Travel share (€2.8 billion), about twice its valuation before takeover rumors first reached the market.[64] Frenzel now argued that Thomson is "a British TUI" that would offer Preussag "the chance for a quantum leap for the expansion of its tourism operations" and a "unique opportunity." Industry commentators were less impressed, pointing out the lack of synergies, Thomson's meager sales margin (3% compared to an industry average of 4%), the fact that Thomson had lost almost half of its 170 pence per share value after its IPO in May 1998, and the fact that EU competition authorities would require Preussag to divest Thomas Cook again in order not to obtain too strong a position on the British market.[65] The stock market clearly took a negative view. All CARs reported in Table 3.3 for the date first rumors became known (Friday, May 12) and on the subsequent official announcement (Monday, May 15) are significantly negative at the 1% level. As these event windows overlap, the most informative statistic is the cumulative abnormal return from May 11 to May 17, which is –15.3% representing a loss of €1.19 billion of Preussag's market capitalization. This is approximately equal to the

[64] The precise measurement depends on the reference date, which is difficult to determine, as there was a run-up as early as March and April 2000. This run-up was possibly caused by rumors in the market, but a part of it may be attributed to fundamental information about Thomson. The stock price on the date before C&N's first offer was 95.25 pence. Preussag's bid premium was 89% relative to this price.

[65] Handelsblatt, May 16, 2000, p. 2, and Wall Street Journal Europe, May 16, 2000, p. 4

premium of €1.23 billion Preussag paid for Thomson Travel on the pre-takeover price, so none of the synergies and economies of scale emphasized by management seemed to justify such a premium from the market's point of view and this sum simply represented a transfer of wealth from Preussag's shareholders to Thomson Travel's shareholders. On May 15, Preussag also published interim semi-annual financial reports, but these were wholly favorable, above the previous year's results and in line with the market's expectations, so we classify May 15, 2000 as a tourism acquisition and disregard the financial statements as a potentially disturbing event.

Insert Tables 3.4 and 3.5 here

Table 3.4 reports the regression results for the period from the Hapag-Lloyd announcement up to and including September 10, 2001. Of the 29 tourism acquisition announcements, 16 are also listed in detail in Table 3.3. We distinguish purchases from WestLB (6 announcements) from all other tourism acquisitions (23 announcements) and find that purchases from WestLB generate a cumulative positive 9% to 16%, whereas all other tourism acquisitions lead to a cumulative abnormal returns of –17% to –52%. Table 3.5 displays the corresponding event study results that are similar in magnitude but generally show somewhat higher levels of significance than the regression results in Table 3.4. Table 3.5 also demonstrates that all tourism acquisitions together result in a cumulated loss of value between 10% and 35%, although this is often statistically insignificant.[66] Results become significant, however, once we distinguish between purchases from WestLB and other purchases. Hence, purchases negotiated under market conditions generated highly significant negative returns, whereas the "friendly" purchases from WestLB (in particular the acquisition of Thomas Cook) where favorable for Preussag. This finding is consistent with the general observation that tender offers and bid-

[66] An advantage of the event study method is that the two classes "Tourism acquisitions from WestLB" and "Other tourism acquisitions" can be merged without changing the results for the other classes of events. For Phases 1 and 3, the event study method and the regression method yield quantitatively very similar results. Generally, the event study results turn out to be slightly more significant than the regression results. We therefore do not present the event study results for Phases 1 and 3.

ding competition generally create lower and mostly negative bidder returns compared to prices established through bilateral negotiations. For example, in a study of bidders that make multiple acquisitions, Fuller, Netter, and Stegemoller (2002) find that returns to the acquisition of public targets are significantly lower than those to the acquisition of privately held firms or subsidiaries (controlling for the identity of the bidder). Altogether, we therefore conclude that entering tourism destroyed shareholder value. In total, Preussag's shareholders paid a price of €0.402 - €1.343 billion for this change of strategy.[67]

As the stock price of Preussag increased relative to the market index during the 1997-2001 phase, we now need to understand where the increase in wealth came from if not from a successful engagement in tourism. Tables 3.4 and 3.5 suggest that there was another part of Preussag's strategy in this period that seemed to be uniquely successful: the divestiture of its former core businesses in steel, non-ferrous metals, plant construction, and building engineering. 25 sell-off announcements fall into this period, seven of which are listed in Table 3.3. The cumulated return to these sell-offs is positive and large overall and often highly significant. The reason for these sell-offs was to obtain money for further investments in tourism and logistics as it appears that Preussag paid cash in all its acquisitions.[68] Other news also had a significant impact on Preussag's stock price as Table 3.3 shows. Since the market reaction is sometimes positive and sometimes negative, the aggregated effect of 'other news' shown in Tables 3.4 and 3.5 is not significant.

Our main conclusion is therefore that Preussag's management generated considerable value for its shareholders during the period from 1997 to 2001 by divesting their former lines of business. Unfortunately, they did not pay out the proceeds to their shareholders but reinvested them in the acquisition of tourism companies instead. The market did not grant Preussag's

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[67] For this comparison, we use the numbers from Table 3.5 (Panel A) and multiply the CARs with the market capitalization on June 10, 1997 of €3.892 billion.

[68] There is no source to confirm this but none of the news sources we studied ever mentions stock or other securities as acquisition currency. The same holds true for all sell-offs except their shipbuilding and plant construction to Babcock, where they accepted Babcock shares in return.

management any specialized skills in this area and seemed to subtract the takeover premiums they paid – notably in the disastrous acquisition of Thomson Travel – one for one from their market value. At the end of this phase, Preussag was mainly a focused tourism and logistics group. At that point, the terrorist attacks of September 11, 2001 brought the period where tourism was a growing, profitable industry to an immediate halt.

4.3 Phase 3: Consolidate tourism (2001-2004)

In the period between September 11, 2001 and December 31, 2004, Preussag underperformed the CDAX by 49.8%. Was the poor performance of Preussag's stock just bad luck? We approach this question in the same way as before.

Insert Table 3.6 here

Table 3.6 displays our regression results for this period. Clearly, no category of events accounts for significant stock price changes in one direction or another. Interestingly, "tourism news" as a group is insignificant over this period. Preussag's stock lost 33.1% (actual return) within the first 10 days after September 11, an underperformance of the index of 20.6% (actual return). However, this and subsequent events like the Iraq war were later compensated by positive news and reassessments by the market. This picture is confirmed by looking at the industry-weighted index, which controls – at least partially – for tourism-specific events. Table 3.6 shows that the magnitude of "tourism news" is always smaller for the weighted industry benchmark than for the CDAX. In fact, Preussag's cumulative abnormal return relative to this index was -81%, indicating that more must be at work here than just a bet on tourism that went wrong *ex post*. Most of the underperformance during this period falls into the category "unexplained returns," i. e. those days where no particular event or news item can be found from any of our sources of information.[69] Note that during this period, the German

[69] We were skeptical that this could be true and went back to search for news on dates of large stock price movements. We found one announcement in Phase 2 related to speculations about a reweighing of the

stock market underperforms the European stock market. The industry-weighted index (in Phase 3 largely tourism) is a European index with a stronger performance than the German market but weaker than the European market at large. Preussag underperformed all of them.

During this period, Preussag's management reacted with standard retrenchment measures. They tried to cut costs in its tourism operations, and to experiment with new products and distribution channels. During 2002, these efforts neither showed any visible success nor did they show which direction management intended to take. For example, on June 19, 2002 they announced a new brand to sell last minute holidays, imitating a strategy of their competitor C&N. On October 10 of the same year, they announced an expansion of their luxury segment, arguing that it had higher margins. Neither announcement impressed the stock market.

In 2003, Preussag (now renamed TUI) announced a new brand "Discount Travel" to expand its franchise in the budget travel market, and was rewarded with an 8.8% increase of its stock price on the same day. However, a few days later Frenzel announced a "restructuring" (effectively shrinking) of the management board that also included the dismissal of both tourism specialists on the board without replacement. Analysts were mostly outraged by the prospect of having Europe's largest tourism company led by a management without any tourism expertise and downgraded the stock. Preussag lost almost 12% of its market value as a consequence.

Overall, Preussag's management struggled with the impact of an increasingly hostile environment after September 11, 2001 – as did most tourism companies. They tried to cut costs, strengthened the luxury segment and later the low cost segment of their operations, fired managers and reorganized internally. Still, the stock market turned its back on the company more than it did on its competitors. Ultimately, the business model of Preussag did not convince the market.

DAX. On other dates, all of them in Phase 3, market commentators talked about "revaluations" without being able to point out significant new information. We discuss press and analysts' coverage in Section 5.2.

4.4 Overall assessment

Preussag's decision to shift gears in 1997 and to give up on their original restructuring plan was well motivated given that previous efforts did not have the desired impact on their performance. However, choices other than simply continuing to struggle with their traditional lines of business or entering tourism were clearly available. In this section we investigate one particular alternative more closely that is suggested by our analysis of Phase 2: simply liquidate the company and pay out the funds to shareholders. Naturally, as mature industries stagnate and shrink, some companies need to exit these markets, and if their managers do not have skills to add value in another industry, then the company should simply liquidate itself. We analyze the following strategies:[70]

1) Execute Preussag's divestiture program precisely as they did during the period 1997-2004. On September 30, 1997, use all cash available at that time to pay off debt and invest the remaining cash in our tourism and transport index.[71] Use all subsequent proceeds from sales of businesses and invest them in the same index on the date of the sale. Similarly, whenever any of the traditional businesses generate free operating cash flows, invest those in the same way. We attribute these cash flows to the last day of the fiscal year. This strategy assumes the position of an investor who wants to invest in tourism and logistics rather than in metal trading, shipbuilding and Preussag's other businesses. However, this investor would put her money into a broad portfolio of logistics and tourism companies rather than those chosen by Preussag. Table 3.7 shows that this would have generated a balance of €11,372 billion on December 31, 2004.

2) Proceed as under 1), but now reinvest cash, free operating cash flows, and sales proceeds from sell-offs in the CDAX. This assumes the position of an investor who simply wanted

[70] In order to estimate exact values for the different strategies we did not use log returns, but actual returns for calculating the index returns. This ensures comparability with the actual history of Preussag's stock until December 31, 2004.

[71] It would be preferable to start this analysis on June 10, 1997 but we are limited to balance sheet data available for the end of the fiscal year 1996/97 and cannot base this analysis on events before that.

to exit from Preussag's businesses and put the money into a broad stock market portfolio. This strategy would have generated a balance of €9,206 billion.

3) Assume the company could have been sold to another investor on June 10, 1997, who would then have proceeded as he wished. Assume the sale price would have been the market value on that date, which was €3.892 billion, then reinvest these proceeds in the stock market. In this scenario, an investment in the tourism and transport index would have generated €5.794 billion by the end of 2004.

4) Proceed as in 3), but now reinvest in the CDAX. Then the resulting value at the end of 2004 would have been €4.495 billion.

Insert Table 3.7 here

Preussag's value (including reinvested dividends) was in fact only €3.333 billion at the end of 2004. The following table compares the results from the four alternatives described above to the actual result:

Strategy	Description	Value (billion €) on December 31, 2004	Change to status quo
0	Actual history (status quo)	3.333	-
1	Liquidate as in history, reinvest proceeds in tourism and transport portfolio	11.372	8.039
2	As (1), reinvest in CDAX	9.206	5.873
3	Invest the market value of Preussag in tourism and transport portfolio	5.794	2.461
4	Invest the market value of Preussag in CDAX	4.495	1.162

The high values for strategies 1 and 2 compared to strategies 3 and 4 reflect the value created through the redeployment of assets. It shows that Preussag's exit strategy was successful. With hindsight, they were even correct in betting on tourism and logistics, as the portfolio reflected in our tourism and transport index outperformed the CDAX by 33% over the period

from June 10, 1997 to December 31, 2004. However, Preussag's management should never have undertaken these investments themselves, as their actual strategy destroyed more than €1.1 billion relative to a passive investment in the stock market, and more than €8 billion relative to the optimal strategy of liquidating the company and leaving it to shareholders to use the proceeds to invest in tourism and logistics companies. Ultimately, this is the range of values lost by Preussag's shareholders, and, in the final conclusion, by the German taxpayer who participated in this enterprise by virtue of WestLB's shareholdings. WestLB sold its stake in Preussag in December 2004 for €950 million. Therefore, given our four alternative strategies above, €0.4 billion to €2.6 billion of German taxpayer's money was wasted by the disastrous strategy of Preussag's management. Interestingly this enormous destruction of taxpayer's wealth was never discussed in the press. The issue was also never raised in the state parliament, presumably because the extent of the value destruction was not apparent. Some newspapers even reported that WestLB was able to realize a book profit (see e.g., Frankfurter Allgemeine Zeitung, December 2, 2004, p. 15).

5 Why things went wrong – the larger context

In this section we wish to understand why the story of Preussag could develop as it did. We therefore analyze decision-making and corporate governance at Preussag. We also put the case of Preussag into a larger context and draw more general conclusions.

5.1 The agenda of Preussag's management

When Preussag's management shifted the company's strategy to tourism in 1997, they explained this move in a letter to the shareholders as part of a "comprehensive modernization of Preussag" and they motivated the focus on tourism as "an industry with sustainable growth prospects." (Preussag, Annual Report 1997/98, pp. 7-8). However, efficient markets would discount the higher growth prospects of tourism companies into their prices and we therefore need to ask how Preussag could justify any acquisition premiums. Preussag's move towards

focusing is in general agreement with the notion that diversification destroys value, but Preussag was focusing on something unrelated to its former business.[72]

Preussag developed the concept of a vertically "integrated tourism company" that would control all stages of the value chain from travel agencies to airlines and hotels.[73] Their argument was that travel agencies would help to divert tourists to company-owned hotels and airlines and thereby increase capacity utilization. Standard arguments in industrial organization suggest that vertical integration may be helpful in overcoming hold-up problems or inefficiencies from double marginalization, but none of these advantages seems to be present here as all segments of the tourism market – with the exception of airlines – feature either a large number of suppliers, or low costs of entry and unspecialized assets (see Section 4.2). When market relationships dominate, standard textbook analysis emphasizes the costs of integration, as integration increases the scope for agency costs and influence activities and prevents the full exploitation of scale and learning economies. These arguments are never reflected in Preussag's press releases or annual reports.

The bid for Thomson Travel was inconsistent with Preussag's proclaimed strategy. At the time, Preussag already had a significant stake in the British market with Thomas Cook. However, Thomson Travel was significantly larger and would otherwise have been acquired by C&N, Preussag's smaller German competitor. Frenzel was possibly frank about his true ambition when he commented that this acquisition "(…) secures our position as the biggest player in Europe" (Wall Street Journal Europe, May 16, 2000, p. 4). Exactly why size would matter for a tourism company and how size could be translated into value creation was never explained. The large number of small tourism companies suggests that economies of scale are limited, and academic studies show that the benefits from mergers and acquisitions do not

[72] See Martin and Sayrak (2003) for a survey of the literature on diversification and its consequences. Some authors argue that the diversification discount is not caused by diversification (see Graham, Lemmon, and Wolf, 2002, and Villalonga, 2004). Moreover, results for Germany indicate a lower diversification discount than for the U.S. (Lins and Servaes, 1999).

[73] Annual Report 1996/97 p. 8, Annual Report 1997/98 p. 8 and pp. 23, 38, 89.

derive from building market power (see Ravenscraft and Scherer, 1987, Mueller, 1985, and Eckbo, 1992).

Our analysis suggests that Preussag's migration from steel and mining to tourism was not the outcome of a well-formulated strategic concept but the result of the ambitions of its management, for which shareholders ultimately had to pay the price. At this stage it appears that Preussag's strategy corresponds more to what Roll (1986) described as "hubris," namely the tendency of corporate managers – epitomized in Warren Buffet's quote at the beginning of the Introduction – to overbid for companies they want to control.[74] Before we subscribe to this view, we investigate if Preussag's strategy generated benefits for its management in Section 5.3.

5.2 The role of analysts and the press

The press and analysts paid close attention to Preussag's dramatic transformation and here we would hope for some more detailed critical comments that would emphasize the risks and downsides in Preussag's strategy. In order to compile our data set we analyze a total of 2,000 newspaper articles and press releases but find little to this effect before 2003, and nothing in the phase before 2000. The press and analysts commented repeatedly on tourism as a "new growth area" that would offer new opportunities to Preussag in comparison to its traditional businesses, and Preussag became a model case of "business migration." Comments by Olaf Toelke, an analyst with Merrill Lynch (Frankfurt) are exemplary when he writes: "The company has come out of its cyclical corner and is now growth-oriented."[75] Stock market analysts apparently supported Preussag's move to become more focused on tourism and to leave its former core businesses behind. The fact that Preussag's management focused on an industry they did not know before received little attention.

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[74] For empirical evidence on the hubris hypothesis see Malmendier and Tate (2008), Raj and Forsyth (2003) and the earlier literature cited by them.

[75] The Wall Street Journal Europe, February 2, 1999. The term "business migration" was explicitly used in the press, see Handelsblatt, February 10, 2000, p. 56.

Our analysis has shown that Preussag's stock outperformed the market during 1997-2001 only because of its divestitures, but many commentators and analysts argued otherwise. In fact, when the stock price took a dip in early 2000, a major newspaper argued, "tourism increases the stock price" and even attributed the recent price drop to Preussag's failure to undertake more acquisitions.[76] Obviously, analysts did not realize that Preussag outperformed the general stock market in spite of its investments in tourism and not because of them. This raises the issue of the status of analysts, as they were not only unable to convince investors of their analysis, but even failed to understand market signals correctly.

5.3 Executive compensation and private benefits

Board seats on other companies. Our first hypothesis is that managers must have gained from the strategy change at Preussag, either through increased compensation or through private benefits. German companies do not disclose itemized private benefits as U.S. companies do, but a measurable indicator of private benefits is the status and prestige conferred on the CEO in the form of additional board seats of other companies. Michael Frenzel is Preussag's CEO during the entire period under consideration here. He joined Preussag's management board in 1988 at age 40 and became CEO in 1994 at age 46. Previously, he had spent seven years at WestLB, Preussag's major shareholder, where he was responsible for managing WestLB's blockholdings in industrial companies. In 1997/98 Frenzel holds board memberships in seven mostly smaller companies[77], three of which are only subsidiaries and another three are state-owned. Over the following seven years, he gives up these seven positions and becomes board member in seven other, bigger firms, including two of Germany's top 30 listed companies.[78] He is also chairman of the board of Germany's state-owned railway operator, and of one of Germany's ten largest banks. During this time Frenzel benefited particularly

[76] Handelsblatt, February 18, 2000, p. 16, quoting Christian Obst (an analyst with HypoVereinsbank) and Rolf Geck (analyst with WGZ-Bank).

[77] Deutsche Hypothekenbank AG, IVG Holding AG, PreussenElektra AG, Creditanstalt AG, Kreditanstalt für Wiederaufbau, Hamburgische Landesbank, Expo 2000 Hannover GmbH.

[78] AXA Konzern AG, Continental AG, Deutsche Bahn AG, Volkswagen AG, Norddeutsche Landesbank, E.ON Energie AG, ING Bank Deutschland AG.

from his close relationship to his mentor Friedel Neuber, chairman of Preussag's supervisory board and CEO of WestLB (see Figure 3.1A). He followed him into the supervisory board of at least three companies, where Neuber was on the supervisory board before him.[79] Frenzel also seemed to be in demand for CEO positions at other German companies.[80] We can therefore conclude that during the period 1997-2004 Frenzel gained significantly in terms of status and prestige and potentially also in terms of his value in the market for managerial labor. This raises a more general question. Some authors, going back to Fama (1980), argue that the market for managerial labor acts as a check on managerial discretion, because managers will not exercise this discretion to the disadvantage of shareholders in order not to reduce the value of their own human capital. Our analysis casts doubt on Fama's theory being an accurate description of the German market for managerial labor.

Executive compensation. German companies did not have to disclose individual salaries or compensation plans before 2006, therefore we only have data on the total compensation of the management board and can only infer averages. Table 3.8 illustrates that management board members received an average fixed salary of €630,000 - €650,000 annually during the period 1994-1997, which puts it significantly above the average for German corporations with more than €1 billion sales, which was €420,000 in 1996 (see Schwalbach, 1999). After 1997, compensation increases dramatically as this fixed salary is complemented by "performance related" pay. This is a €500,000 of bonus dependent on dividend payouts and a phantom stock scheme, where managers can sell phantom shares at the actual share price after a vesting period of two years.[81] Management board members received €7.7 million worth of phantom

[79] Neuber was on the board of Deutsche Bahn AG from 1997– 2004, Frenzel follows 1999; Neuber is on the board of AXA S. A. from 1997– 2001, Frenzel joints AXA Colonia AG's board in 1998, Neuber was on the board of Bank Austria AG from 1997 – 2000, Frenzel is on Creditanstalt's (acquired by Bank Austria in 1998) board. In all cases, we provide the earliest date of board membership we can establish, so board membership may have existed before.

[80] RWE (Die Welt am Sonntag, April 28, 2002), where Neuber is chairmen of the supervisory board, and Deutsche Telekom (press release of Preussag, July 12, 2002).

[81] To sell phantom stocks after the vesting period no absolute or relative performance target has to be met, which is unusual for German compensation practice.

stock during 2001-2003 that lost approximately €3.4 million during the same period.[82] As a result, the average salary of Preussag's management board members increased by 279% from €526,000 in fiscal year 1993/94 to €1,992,000 in fiscal year 2004 (see Table 3.8).[83] Therefore, while Preussag's shareholders did not benefit from the company's tourism strategy, its management certainly did. The overall increase in compensation can rationalize why Preussag's management was concerned with size. While the company did not increase in value, it did increase in sales and total assets (see Table 3.1 for sales, the development of assets is similar). This is consistent with the general result that managers benefit from acquisitions when these increase size and thereby lead to higher managerial salaries. This view can be dated back to Baumol (1959) and evidence for the U.S. was found by Khorana and Zenner (1998).

Insert Table 3.8 here

Our compensation analysis also suggests that contracts did not align the interests of management with those of shareholders. Management board members together held 1,690 shares worth €27,000 and representing about 0.001% of Preussag's capital in 2002.[84] So compensation on the whole had practically no relationship to performance, in line with the practice of most German companies until the late 1990s.[85] The question of how much performance sensitivity would constitute a sufficiently high-powered compensation contract is open to debate. Jensen and Murphy (1990) establish that U.S. CEOs receive an additional $3.25 for every $1,000 of shareholder value they create and regard this value as too low. Murphy (1999) points out that the picture had changed during the 1990s when performance sensitivity increased. Schwalbach and Graßhoff (1997) indicate that the situation is generally worse in Germany than in the United States. Preussag's pay for performance sensitivity was just 1 cent

82 Preussag Annual Report 2002, pp. 207-208, Preussag Annual Report 2003, pp. 206-207.

83 In fiscal year 2004 Preussag disclosed individual salaries for the first time. Michael Frenzel earned €3,220,000 in 2004 (Preussag Annual Report 2004, pp. 196-197).

84 Preussag Annual Report 2002 pp. 208-209. At the end of 2003, the shareholdings of the management board dropped to 784 shares worth €13,000 or about 0.0005% (Preussag Annual Report 2003, p. 208). The number of shares stayed constant in 2004 (Preussag Annual Report 2004, p. 198).

85 This calculation of performance sensitivity does not include the phantom stock scheme that was introduced in 2001 (Preussag's Annual Report, 2002), as we do not know the parameters of this scheme.

for every thousand € of shareholder value created, a number that falls short of Jensen and Murphy's number and that appears too low to provide effective incentive alignment.

The case of Preussag therefore corroborates the findings of Mehran, Nogler, and Schwartz (1998) who document a relationship between voluntary liquidation decisions and CEO incentives. An example of a case where good alignment of incentives created shareholder value through a partial liquidation is General Dynamics (see Dial and Murphy, 1995). However, Mehran, Nogler, and Schwartz (1998) also point to the importance of complementary governance structures, particularly the board of directors, to induce voluntary liquidations, a subject to which we turn next.

5.4 Ownership and control: The role of WestLB

A change in strategy could have been forced upon management by its large shareholders or its supervisory board. Typically, this would take the form of replacing management with one that is more likely to execute a strategy that is in the interest of shareholders. However, Frenzel, who assumed the position of CEO on January 1, 1994 still held this position eleven years later, after initially failing to restructure the core business, and then failing equally at guiding Preussag to a more profitable future by entering a new industry. Generally, the rate of CEO turnover for German companies is high (see Kaplan, 1994), and this continuity is therefore surprising. However, this outcome can be easily understood, if we look at the distribution of votes and the composition of the supervisory board.

Insert Table 3.9 here

Voting power. WestLB has been the only major blockholder at Preussag since 1969 (see Section 2 and Figure 3.1A). Table 3.9 displays data on WestLB's voting power in nine of the ten annual general meetings of Preussag during the period under consideration. On average, 57% of the capital was represented and WestLB had 59.2% of the votes represented by virtue of its direct shareholdings, sufficient to command a majority at four of these meetings. At another

four meetings WestLB commanded the majority jointly with Niedersachsen Holding (see Figure 3.1A). At the one remaining meeting on March 31, 1999 WestLB commanded 49.3% of the votes, just short of a majority. We therefore conclude that WestLB dominated Preussag through its voting power.

Supervisory board.[86] The supervisory board of Preussag is subject to the German co-determination act, so half of its twenty members are representatives of workers and the other half represent shareholders. Of the latter, two are representatives of WestLB as its major shareholder and Neuber, CEO of WestLB, is also the chairman of Preussag's supervisory board throughout the entire period.[87] Figure 3.4 demonstrates that WestLB strengthened its influence through board interlocks. At any time at least two of Preussag's supervisory board members were members of the management board in other firms in which Neuber was also chairman of the supervisory board (RWE) or at least held supervisory board memberships (like Deutsche Bahn or ThyssenKrupp). The supervisory board also included representatives of other German banks and corporations, an independent (Frantz Vranitzky, former social-democratic chancellor of Austria) and an organization representing small shareholders (DSW). Only this last supervisory board member should have had a clear interest in furthering shareholder value, but we are not aware that he ever raised his voice. On December 31, 2002, when the shareholdings of the supervisory board were disclosed for the first time, all board members together held 0.002% of Preussag's shares (Preussag, Annual Report 2002, pp. 208-209). Economists have always viewed board interlocks with skepticism (the classic reference is Dooley, 1969). Loderer and Peyer (2002) and our analysis in Chapter II relate interlocks to performance. Loderer and Peyer (2002) show for a sample of Swiss firms that the proportion of directors who are also directors on the board of a bank has a negative impact on Tobin's q.

[86] All the information about supervisory board meetings and committees are taken from the annual reports of Preussag from 1994 to 2004 (*Bericht des Aufsichtsratsvorsitzenden*).

[87] Friedel Neuber unexpectedly died at the age of 69 on October 23, 2004.

The analysis in Chapter II suggests that bank representation on the board causes lower valuations of German companies.

Insert Figure 3.4 here

We conclude that WestLB's voting power was matched by the control it exercised over Preussag's supervisory board. We therefore need to understand why WestLB was unwilling to use its hold on Preussag in order to push for a more shareholder-friendly strategy and why, in particular, it failed to prevent the catastrophic acquisition of Thomson Travel. WestLB itself is state-owned and its management is accountable only to the political representatives of North Rhine Westphalia, Germany's largest and most populous state. The governance structure of WestLB itself does not impress any particular profit motive or incentive for value maximization on its management. To the contrary, the bank serves a distinct political purpose and repeatedly used its financial muscle to prevent decisions that would increase shareholder value but conflict with other, politically defined interests. Examples include the prevention of layoffs at financially distressed firms or of relocations of headquarters or production facilities into another state.[88] Beyond its politically defined objectives, WestLB's management seems to enjoy considerable freedom in shaping its policies.

When Preussag entered tourism, WestLB already had a number of large, if not controlling stakes in other tourism companies (see Figure 3.1A). Preussag's engagement in tourism opened the opportunity for WestLB to divest itself of its tourism assets. Preussag bought WestLB's TUI-stakes and 50.1% of its Thomas Cook block. Preussag also bought WestLB's 22% stake in the First chain of travel agencies. Hence, it is at least plausible that WestLB found Preussag to be a willing partner to divest themselves of their tourism holdings. It is therefore natural to suppose that Preussag was merely a victim of a policy forced upon it by its large shareholder. However, in the transactions where Preussag bought assets from

[88] Examples of such interventions include Horten AG and Geresheimer Glas (Handelsblatt, December 3, 1990 p. 21), LTU (Handelsblatt, December 24, 2001, p. 12) and Babcock (Handelsblatt, January 17, 2003, p. 10).

WestLB, notably in the case of Thomas Cook, Preussag's stock gained and these gains are economically and sometimes also statistically significant (see Section 4.2). We therefore conclude that WestLB sold its assets to Preussag at a discount to their intrinsic value, which is clearly inconsistent with WestLB abusing its power over Preussag. A more plausible interpretation is that Preussag continued a strategy initially formulated and pursued by Neuber and WestLB. When WestLB collected its tourism stakes in the period 1989 – 1997, the press speculated repeatedly about Neuber's overall strategy.[89] Press speculation just days before the announcement of the Hapag Lloyd takeover (Die Zeit, June 6, 1997 p. 17) discussed the different possibilities available to WestLB: either to divest its tourism holdings by merging them into a new, independent company, or by merging them with those of Preussag. It therefore appears that Frenzel completed a former project of Neuber, but without creating tangible benefits for either Preussag or WestLB.

In the final conclusion, we therefore caution against the notion that large controlling shareholders are always a blessing as they help to overcome the separation of ownership and control. The literature on large shareholder monitoring typically assumes that large blockholders have a strong interest in maximizing shareholder value and ignores the additional agency conflicts if these large shareholders are companies or institutions.[90] In the case of Preussag, however, the largest shareholder is an intermediary whose management has ambitions of its own. Our findings are more in line with the view of Franks and Mayer (2001) that the gains from

[89] Examples include Handelsblatt, June 29, 1990. Handelsblatt, June 5, 1992 p. 21, Die Zeit, January 6, 1995 and Handelsblatt February 21, 1995. The last article argues that Neuber plans an IPO of WestLB's tourism holdings in the medium term.

[90] This literature is devoted to the role of large shareholders in helping shareholders to overcome the free-rider problem when they need to take action against management. It dates back at least to Shleifer and Vishny (1986). Contributions include Admati, Pfleiderer, and Zechner (1994), Bolton and von Thadden (1998), Kahn and Winton (1998), Maug (1998), who all focus exclusively on shareholders' collective action problem.

block trades in Germany are not shared with minority shareholders: they are mainly about private benefits from control.[91]

Our findings also lend some support to the more general view that poor governance arises almost inevitably from combinations of public with private governance as it results in incompatible supervisory mechanisms and in a lack of accountability. Aktas, de Bodt, and Liagre (2003) summarize their reading of the literature on state-owned enterprises and privatizations in the same way, arguing that the government protects the interests of employees and other constituencies more than shareholders and that managers are hardly ever held accountable.[92] We view the state ownership of WestLB as a contributing factor rather than as a prime cause because the agency problem within WestLB discussed above would exist even for a privately owned bank.

5.5 Conflicts of interest

We conclude this section with a discussion of conflicts of interest in Preussag's corporate governance structure. We show that these are obvious and significant but contribute little to the explanation of Preussag's underperformance.

Political affiliations. Both Neuber and Frenzel were members of the social democratic party (SPD), Germany's labor party. Relationships within this party seem to have played a particular role in the sale of Preussag's steel business to a holding controlled by the state of Lower Saxony under its then prime minister Gerhard Schröder. According to one magazine report, Schröder was surprised to learn so late of Frenzel's and Neuber's plans to sell Preussag's steel

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91 See also Dyck and Zingales (2004) for an international comparison of private benefits of control measured from block trade data.

92 See Megginson and Netter (2001) for a survey of the empirical literature on privatizations, especially their Table 1 (p. 333) that summarizes 10 empirical studies, 9 of which find underperformance of state-owned enterprises compared to private enterprises. In a study of 50 international airlines, Backx, Carney, and Gedajlovic (2002) also investigate mixed public and private ownership, which is also the case of Preussag. They find that mixed ownership companies underperform privately owned companies, but not as much as fully state-owned enterprises.

business to an Austrian company.[93] Preussag initially negotiated with the Austrian group Voest-Alpine, but Gerhard Schröder, then fighting for re-election as prime minister of Lower Saxony, could not afford to confront the unions and Preussag steelworkers and therefore agreed to purchase the stakes from Preussag in order to buy time for an IPO. Preussag management board member Wolfgang Schultze was a representative of the SPD in the Lower Saxonian legislature and Bodo Hombach, CEO of Preussag's steel trading unit became chief of staff of chancellor Schröder's office in the fall of 1998. With Neuber and Frenzel, these negotiations included five members of this party on all sides of the transaction, which ousted Austrian Voest Alpine from the negotiations. While Preussag asserted that the offers by the state of Lower Saxony and Voest Alpine where of "equivalent value," the Voest Alpine offer was structured differently, including a 20% stake in a joint venture with Preussag, and valued by some to be higher by about €100 million.[94] It is conceivable that party affiliations also played a role when Preussag wanted to take over the 25% stake of TUI held by Deutsche Bahn (DB), Germany's state-owned railway company. They could not agree with DB on a price under the then conservative government. When Schröder became Chancellor of Germany in September 1998, Preussag's luck turned: negotiations went more smoothly and Preussag acquired the DB-stake in April 1999.[95]

Lack of arms-length bargaining. Our event-study analysis suggests that Preussag overpaid for Hapag-Lloyd, as their share price dropped when the final sales price was announced (see Table 3.3). Here two blockholders, owning 10% of Hapag-Lloyd's shares each, were Dresdner Bank and Deutsche Bank (see Figure 3.1A). Both were also represented on Preussag's supervisory board at the same time (see Figure 3.4), so that from this point of view there was a conflict of interest as these supervisory board members represented buyer interests and seller interests at the same time.

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93 Der Spiegel, January 1, 1998, pp. 24-25.
94 See Handelsblatt, February 5, 1998, p. 13.
95 See Handelsblatt, May 15, 1998 p. 15 and Tagesspiegel, April 6, 1999 p. 21.

The strongest conflict of interest arose when Preussag sold its plant construction and shipbuilding operations to Babcock Borsig AG. This time the conflict was resolved in Preussag's favor. WestLB was the largest shareholder of Babcock with only a 10% stake, and Neuber chaired its supervisory board as he did Preussag's. In addition, Preussag management board member Klaus Linnebach, responsible for plant construction and shipbuilding, was a member of Babcock's supervisory board, effectively putting the same individuals on both sides of the negotiation table, and presenting Preussag with an excellent opportunity to divest itself of its loss-making plant construction and shipbuilding arm. Minority shareholders of Babcock protested in vain, arguing that the transaction did not fit Babcock's strategy to focus on power plants.[96] When the details of the transaction where disclosed on March 15, 1999, Preussag gained 7.2% and Babcock's share lost 5% over the (0, 1) window, although we need to take into account simultaneous disclosures of financial statements and planned issues of new securities (see also Table 3.3). Hence, this transaction supports our general conclusion that sell-offs generated value for Preussag, but this time it took the form of a redistribution at the expense of Babcock shareholders. Babcock filed for bankruptcy on July 5, 2002 and the state persecution service (equivalent to the district attorney in the U.S.) took up investigations against Neuber, Frenzel and others because of alleged violations of German securities laws in this context.[97]

All of these cases are evidence for poor corporate governance, and they certainly resulted in poor decisions. However, none of them can account for the massive value destruction at Preussag and the particular strategy followed by Preussag's management. Conflicts of interest were blatant and may have caused a loss of value in some cases (Preussag steel, Hapag Lloyd), but in other instances (notably Babcock) they benefited Preussag.

[96] Handelsblatt, March 19, 1999, p. 14.
[97] Handelsblatt, January 14, 2003, p. 1.

6 Reaction by Preussag's management

We did not receive any support from Preussag in writing this study. We therefore rely exclusively on publicly available information. In April 2005, "Capital," a German business magazine, picked up our story and confronted Preussag's CEO Michael Frenzel during an interview with some of the results from a previous version of this chapter (Capital, April 28, 2005, pp. 54-55). Frenzel's arguments are revealing. He argued that our calculation according to which Preussag destroyed several billions (see Section 4.4) is "unfair, because it ignores completely that the TUI management succeeded in building Europe's largest tourism company," thereby reemphasizing his focus on size.[98]

Next, Frenzel argued that the TUI-management had "created high-quality tourism jobs in Germany" and suggested that the liquidation of Preussag would have destroyed 50,000 jobs. This argument not only defies economic logic (the jobs in tourism companies would exist quite independently of whether Preussag acquired these companies or not) but also neglects that tourism employment at Preussag fell by more than 10% between 2002 and 2004.

Frenzel also expressed the view that Preussag's stock was underpriced and did not reflect the company's true earnings potential. When the interviewer confronted him with the result that the future profitability of Preussag was not priced into its stock, but seemed to be well anticipated in increased managerial salaries, he retorted that compensation was about average for a DAX-30-corporation. This is correct, and restates why size is important from the point of view of management, as we suspected. Still, the argument does not recognize that Preussag was among the smallest companies in the index and almost dropped from the index when its value declined in 2004.

Last, the interviewer asked Frenzel why Preussag's management would not invest in their own stock if they considered it to be underpriced (they held 784 shares at the end of 2004).

[98] All translations from the German interview are ours.

The response was that "buying [shares] is not the problem. The difficulties begin, when managers sell shares. Then there is an automatic presumption of insider trading based on the assumption that managers have additional information." Hence, managers did not want to buy shares because they would not be able to sell them again. Clearly, the notion of holding shares for the long term was not considered.

Between October 2006 and May 2008, TUI's management was approached by a number of investors (in particular, Hermes Focus Asset Management) with requests, among others, to restructure the company and to impose a stricter M&A discipline. Investors also demanded the resignation of Frenzel. At the annual general meeting on May 7, 2008, a Norwegian investor who had acquired 12% of TUI shares launched a proxy fight (to the best of our knowledge the first in Germany in a large company), but the incumbent management won the contest by receiving 57% of the vote.

7 Conclusion

In this chapter, we analyze the history of Preussag, later renamed TUI, over the decade from 1994 to 2004, where they rebuilt an originally diversified industrial conglomerate into Europe's largest tourism company. We collect data on 125 announcements relating to 93 transactions and 292 news events during this period and analyze the sometimes puzzling history of Preussag's stock. We categorize events in order to disentangle the value impact of different parts of Preussag's strategy and test competing hypotheses for the sources of value creation and value destruction.

We find that Preussag benefited from its divestitures, whereas its engagement in tourism destroyed value. The underperformance of its stock is a direct consequence of its business strategy and cannot be attributed to exogenous shocks like the events of September 11, 2001. In the tourism industry, size seems to matter little for profitability as economies of scale and gains from market power are limited. We conclude that Preussag's management sought size

for its own benefit. Our analysis of corporate governance at Preussag yielded three insights that are likely to have contributed to Preussag's underperformance:

- Management compensation increased by more than 200% over the decade considered in this study. At the same time, compensation was practically unrelated to firm performance.
- Personal networks generated private benefits through additional board seats and created a governance structure where accountability was easily lost.
- The agency problem within the largest shareholder made it not only a poor monitor but in all likelihood even a motor of the tourism strategy. Hence, the largest shareholder helped creating benefits from control rather than constraining them.

Curiously, none of the watchdogs felt particularly alarmed by the ongoing destruction of shareholder value. Preussag's stock outperformed the market during the period when they entered tourism, and analysts and the press misread this as a good signal about its decision to focus on tourism. Here our analysis becomes valuable as it shows that aggregate performance is misleading. We disentangle the impact of divestitures from the investments in tourism and show that the former created the value that camouflaged the losses from the latter. We are therefore skeptical about the role of independent analysts, some of whom did not only fail to inform the market but also failed to understand market signals as investors started to abandon the stock.

The misguided management policies at Preussag bring out an important point of the "free cash flow" theory: The problem is not just high operating cash flows, but managerial discretion over large amounts of liquid resources, independently of their source.[99] At Preussag, divestitures created additional liquidity – and they appear to have only been undertaken to pro-

[99] The free cash flow theory goes back to Jensen (1986), (1993). DeAngelo, DeAngelo, and Wruck (2002) make a point related to ours in their analysis of managerial discretion created by liquid working capital at L. A. Gear. Lang, Poulsen, and Stulz (1995) show that the stock market discounts companies who retain the proceeds from asset sales. Allen and McConnell (1998) make a similar point on equity carve-outs.

vide this liquidity – without any corresponding incentives for management to use this liquidity efficiently or any check against management's pet project to be the dominant tourism company in Europe.

8 Tables

Table 3.1: Preussag's sales by business units

This table displays the sales of Preussag's business units, including sales between units. In 2001, Preussag changed its end of fiscal year from September 30 to December 31. The table does not report sales for the shortened fiscal year that consisted only of the last quarter of 2000. The Herfindahl index reflects the degree of diversification of the conglomerate. It is equal to the sum over all divisions of their squared percentages of sales. All numbers before conversion to the € in 1999 are reported in € using the official conversion rate of 1.95583 DM/€.

Panel A: Preussag's sales from 1992/93 to 1997/98

	1992/93		1993/94		1994/95		1995/96		1996/97		1997/98	
	Mill. €	%	Mill. €	%	Mill. €	%	Mill. €	%	Mill. €	%	Mill. €	%
Tourism	-	-	-	-	-	-	-	-	-	-	5,530	27.9%
Steel production	1,409	10.4%	1,683	12.4%	1,876	12.4%	1,615	11.2%	1,787	11.5%	-	-
Non-ferrous metal production	652	4.8%	612	4.5%	691	4.6%	723	5.0%	370	2.4%	-	-
Oil and gas production	524	3.9%	501	3.7%	520	3.4%	577	4.0%	702	4.5%	905	4.6%
Mining activities	953	7.0%	718	5.3%	742	4.9%	678	4.7%	556	3.6%	607	3.1%
Trading	4,986	36.9%	5,613	41.4%	6,574	43.4%	5,571	38.5%	6,145	39.5%	5,081	25.7%
Logistics	479	3.5%	479	3.5%	954	6.3%	1,025	7.1%	1,060	6.8%	3,242	16.4%
Shipbuilding	822	6.1%	688	5.1%	576	3.8%	911	6.3%	610	3.9%	572	2.9%
Railcar manufacturing	220	1.6%	-	-	-	-	-	-	-	-	-	-
Plant construction	1,512	11.2%	1,475	10.9%	1,706	11.3%	1,675	11.6%	2,121	13.6%	1,663	8.4%
Information technology	591	4.4%	310	2.3%	-	-	-	-	-	-	-	-
Building engineering	950	7.0%	1,036	7.6%	1,137	7.5%	1,321	9.1%	1,840	11.8%	1,909	9.6%
Components	178	1.3%	171	1.3%	104	0.7%	93	0.6%	89	0.6%	-	-
Other/Consolidation	242	1.8%	257	1.9%	253	1.7%	294	2.0%	289	1.9%	282	1.4%
Total	13,518	100.0%	13,543	100.0%	15,133	100.0%	14,483	100.0%	15,569	100.0%	19,791	100.0%
Earnings before Taxes	177	1.3%	258	1.9%	317	2.1%	239	1.7%	360	2.3%	521	2.6%
Herfindahl index		18.1%		21.6%		23.4%		19.8%		21.2%		19.1%

Panel B: Preussag's sales from 1998/99 to 2004

	1998/99		1999/2000		2001		2002		2003		2004	
	Mill. €	%	Mill. €	%	Mill. €	%	Mill. €	%	Mill. €	%	Mill. €	%
Tourism	8,480	45.5%	12,768	50.8%	12,782	57.0%	12,432	61.2%	12,701	66.1%	13,204	73.2%
Steel production	-	-	-	-	-	-	-	-	-	-	-	-
Non-ferrous metal production	-	-	-	-	-	-	-	-	-	-	-	-
Oil and gas production	765	4.1%	983	3.9%	836	3.7%	448	2.2%	177	0.9%	-	-
Mining activities	-	-	-	-	-	-	-	-	-	-	-	-
Trading	3,818	20.5%	4,800	19.1%	3,144	14.0%	3,150	15.5%	2,056	10.7%	972	5.4%
Logistics	3,332	17.9%	3,972	15.8%	3,891	17.4%	3,778	18.6%	3,915	20.4%	3,972	19.2%
Shipbuilding	-	-	-	-	-	-	-	-	-	-	-	-
Railcar manufacturing	-	-	-	-	-	-	-	-	-	-	-	-
Plant construction	-	-	-	-	-	-	-	-	-	-	-	-
Information technology	-	-	-	-	-	-	-	-	-	-	-	-
Building engineering	1,999	10.7%	2,372	9.4%	1,611	7.2%	203	1.0%	-	-	-	-
Components	-	-	-	-	-	-	-	-	-	-	-	-
Other/Consolidation	243	1.3%	217	0.9%	147	0.7%	292	1.4%	366	1.9%	398	2.2%
Total	18,637	100.0%	25,112	100.0%	22,411	100.0%	20,303	100.0%	19,215	100.0%	18,046	100.0%
Earnings before Taxes	620	3.3%	747	3.0%	811	3.6%	608	3.0%	913	4.8%	622	3.4%
Herfindahl index		29.4%		33.1%		38.2%		43.4%		49.0%		57.6%

Table 3.2: Preussag's abnormal returns in Phase 1: Consolidate core businesses (1994-1997)

This table presents the results of eight regressions of Preussag's daily abnormal log returns over phase 1 from January 1, 1994 to June 10, 1997 on an intercept and three dummy variables: *acquisitions*, *sell-offs*, and *news*. The dummy variables are set equal to one on every day of the event windows around the events they indicate. The table reports the estimated regression coefficients multiplied by the number of days the respective dummy variable is equal to one. *Unexplained return* is the estimated intercept multiplied by the number of observations in the regression. °, *, **, *** marks significance at the 15%, 10%, 5%, and 1% significance level, respectively. Results are displayed for four different event windows (-*x*, *y*) from *x* days before to *y* days after the event. Panel A presents regression results for abnormal returns calculated relative to the Frankfurt market portfolio CDAX. Panel B contains similar results when abnormal returns are calculated relative to our weighted industry benchmark.

Panel A: Abnormal returns relative to the market index (CDAX)

Event group	Number of events	Event window			
		(0, 1)	(-1, 1)	(0, 2)	(-1, 2)
Acquisitions	12	0.13%	-1.58%	-2.72%	-4.58%
Sell-offs	15	3.97%	-0.15%	6.92%	2.62%
News	67	-24.35%**	-25.99%*	-35.62%**	-43.36%***
Unexplained returns	N/A	3.13%	10.60%	14.30%	28.21%
Total return	N/A	-17.11%	-17.11%	-17.11%	-17.11%

Panel B: Abnormal returns relative to weighted industry benchmark

Event group	Number of events	Event window			
		(0, 1)	(-1, 1)	(0, 2)	(-1, 2)
Acquisitions	12	-1.82%	-1.59%	-5.73%	-5.72%
Sell-offs	15	11.53%*	0.26%	10.79%	-0.81%
News	67	-21.76%°	-26.87%°	-30.78%*	-40.09%**
Unexplained returns	N/A	-10.71%	5.44%	2.96%	23.86%
Total return	N/A	-22.76%	-22.76%	-22.76%	-22.76%

Table 3.3: Individual cumulative abnormal returns in Phase 2: Enter tourism (1997-2001)

This table displays the cumulative abnormal log returns over four different event windows (-*x*, *y*) from *x* days before to *y* days after the event.

Date of Ann.	Description of event	Cumulated Abnormal Returns			
		(0, 1)	(-1, 1)	(0, 2)	(-1, 2)
11 Jun 97	Preussag announces the plan to acquire the tourism and logistics company Hapag-Lloyd. Sales: €2.3bn.	3.1%	2.4%	2.7%	2.0%
02 Sep 97	Preussag announces the agreement with Hapag-Lloyd shareholders to acquire 99.2% of all shares for €1.43bn.	-4.7%**	-6.4%**	-6.4%**	-8.1%***
12 Jan 98	Preussag sells 51% and an option for the remaining 48.8% of its steel production unit (Preussag Stahl AG) to the state of Lower Saxony and NordLB. Price: €542m	6.2%***	6.0%**	4.5%*	4.2%
02 Mar 98	German federal cartel office allows Preussag to acquire Hapag-Lloyd and the majority of TUI. At the same time, Schickedanz-Group announces to sell its 20% stake of TUI. After WestLB and Deutsche Bahn exercise their pre-emptive rights to purchase 7.5% respectively 5% of TUI shares, Preussag acquires the remaining 7.5%. Price: €96m	3.6%°	3.3%	4.3%°	4.1%
09 Jun 98	Preussag announces the acquisition of 12.6% of TUI from WestLB. Preussag becomes majority shareholder of TUI. Price: €160m	3.0%	1.8%	3.0%	1.9%
02 Jul 98	Preussag reorganizes its tourism activities in a new holding (Hapag Touristik Union). Sales: €5.3bn	1.0%	0.2%	4.4%*	3.6%
06 Jul 98	Reorganization of Preussag's management board. The division managers lose power. This is an important step for the coming divestitures of Preussag.	9.1%***	10.6%***	13.3%***	14.8%***
06 Oct 98	WestLB and Carlson agree on a merger of Thomas Cook and the U.K. business of Carlson; Carlson will hold 22% and WestLB 78% of the merged company.	-6.3%**	-4.3%	-3.5%	-1.6%
08 Oct 98	Rumors about further transactions between Preussag and WestLB. Preussag confirms talks with WestLB about an acquisition or cooperation with Thomas Cook.	6.7%***	4.6%*	9.0%***	7.0%**
12 Nov 98	After an intervention of Germany's federal cartel office WestLB has to sell its stake in LTU. Until the end of 2000, WestLB formally keeps 10.2% of LTU because of international aviation laws.	0.3%	1.2%	-1.6%	-0.7%
02 Dec 98	Rumors that Preussag plans to acquire Thomas Cook and negotiates with WestLB about WestLB's stake in Thomas Cook.	0.5%	5.4%**	3.6%	8.6%***
17 Dec 98	Preussag acquires 100% of First travel agencies (22% from WestLB). Sales: 1.8bn.	3.3%°	4.8%*	3.5%	5.0%°
23 Dec 98	Preussag acquires 24.9% and an option for further 25.2% of Thomas Cook from WestLB for €146m.	0.5%	-1.8%	-0.5%	-2.8%
end of 1998	Niedersachsen Holding GmbH is dissolved. Its Preussag shares are distributed among the three owners of Niedersachsen Holding. (No exact date available.)				

Date of Ann.	Description of event	Cumulated Abnormal Returns			
		(0, 1)	(-1, 1)	(0, 2)	(-1, 2)
05 Jan 99	Preussag sells its complete share of 50.2% of Deilmann-Haniel GmbH (mining and engineering firm) to the Heitkamp-Group. Sales: €373m	1.6%	7.4%***	-1.3%	4.5%°
02 Feb 99	Preussag announces talks about its plant construction and shipbuilding units with Babcock (a German plant construction company). Sales: €2.1bn. At the same day: publication of Preussag's annual accounts and announcement of an equity rights issue.	-4.6%**	1.0%	-6.8%**	-1.2%
08 Feb 99	Babcock's supervisory board agrees to the acquisition of Preussag's plant construction and shipbuilding business.	4.0%*	7.0%***	-0.8%	2.3%
15 Mar 99	Preussag and Babcock close the deal. Preussag receives €180m in stock and €142m in cash for 100% of its plant construction and 50% of its shipbuilding unit.	7.2%***	4.4%°	4.3%°	1.5%
06 Apr 99	Preussag's acquires 25% of TUI from Deutsche Bahn (German railway operator). Price: €320m.	1.5%	0.0%	4.7%°	3.2%
17 Jun 99	Preussag and Kuoni (largest Swiss tourism company) announce a cooperation of their tourism activities in Switzerland. Kuoni gets the option to acquire up to 49% of TUI Suisse. Sales of TUI Suisse: €343m	2.1%	2.2%	8.1%***	8.3%***
01 Jul 99	Preussag acquires the remaining 24.9% of TUI from WestLB.	-2.3%	-2.6%	2.3%	2.1%
30 Sep 99	Preussag exercises its option to acquire another 25.2% of Thomas Cook from WestLB.	-3.9%°	-6.3%*	-2.5%	-4.8%
04 Feb 00	Preussag announces to acquire 75% of Goulet Touropa (Austria's largest tourism company). Sales: €330m	-1.2%	-1.3%	-7.6%***	-7.6%***
12 May 00	Rumors about a new bidder, most probably Preussag, in the takeover battle between C&N (3rd largest European tourism group) and Thomson Travel Group plc (4th largest European tourism company).	-9.1%***	-10.5%***	-15.8%***	-17.3%***
15 May 00	Preussag announces the friendly takeover of the Thomson Travel Group plc. Price: €2.8bn. At the same day: publication of Preussag's interim semi-annual accounts, which were in line with market expectations.	-11.9%***	-15.8%***	-9.9%***	-13.9%***
13 Jul 00	Profit warning from Airtours (3rd largest European tourism company).	-7.9%***	-8.5%***	-10.0%***	-10.7%***
01 Aug 00	Preussag announces the plan to sell all 21,000 apartments of its real estate activities. Price: ca. €500m	6.4%***	9.4%***	9.9%***	12.9%***
09 Oct 00	Preussag announces the stepwise acquisition of Nouvelles Frontières (largest French tourism company). Price for the complete acquisition: €123m	4.6%**	4.4%°	3.0%	2.8%
05 Dec 00	Preussag sells its share (50.1%) of Thomas Cook to C&N Touristic to avoid an intervention of European competition authorities against the Thomson Travel takeover. Price: €450m	5.0%**	7.0%**	4.9%*	6.8%**
04 Apr 01	Preussag acquires the remaining 50% of its Belgian tourism subsidiary TUI Belgium.	-3.7%*	-3.6%	-5.2%**	-5.1%*

Table 3.4: Preussag's abnormal returns in Phase 2: Enter tourism (1997-2001)

This table presents the results of eight regressions of Preussag's daily abnormal log returns over phase 2 from June 11, 1997 to September 10, 2001 on an intercept and six dummy variables: *tourism acquisitions from WestLB*, *other tourism acquisitions*, *other* (non-tourism) *acquisitions*, *sell-offs*, *tourism news*, and *other news*. The dummy variables are set equal to one on every day of the event windows around the events they indicate. The table reports the estimated regression coefficients multiplied by the number of days the respective dummy variable is equal to one. *Unexplained return* is the estimated intercept multiplied by the number of observations in the regression. °, *, **, *** marks significance at the 15%, 10%, 5%, and 1% significance level, respectively. Results are displayed for four different event windows (-*x*, *y*) from *x* days before to *y* days after the event. Panel A presents regression results for abnormal returns calculated relative to the Frankfurt market portfolio CDAX. Panel B contains similar results when abnormal returns are calculated relative to our weighted industry benchmark.

Panel A: Abnormal returns relative to the market index (CDAX)

Event group	Number of events	Event window			
		(0, 1)	(-1, 1)	(0, 2)	(-1, 2)
Tourism acquisitions					
from WestLB	6	10.37%°	9.20%	16.27%*	15.05%°
other	23	-22.59%°	-37.37%**	-34.92%**	-52.41%***
Other acquisitions	10	13.44%°	10.00%	13.01%	10.00%
Sell-offs	25	44.69%***	52.17%***	26.87%°	37.47%*
Tourism news	8	8.00%	20.18%**	4.24%	16.59%
Other news	80	16.21%	42.58%	18.09%	43.85%
Unexplained returns	N/A	-47.99%	-74.63%	-21.43%	-48.42%
Total return	N/A	22.13%	22.13%	22.13%	22.13%

Panel B: Abnormal returns relative to weighted industry benchmark

Event group	Number of events	Event window			
		(0, 1)	(-1, 1)	(0, 2)	(-1, 2)
Tourism acquisitions					
from WestLB	6	8.81%	9.19%	15.79%*	16.13%*
other	23	-17.29%	-37.83%**	-24.49%°	-47.53%**
Other acquisitions	10	15.98%*	16.90%°	11.74%	12.90%
Sell-offs	25	37.88%***	48.31%***	14.41%	27.44%
Tourism news	8	2.74%	8.42%	0.71%	6.57%
Other news	80	34.08%	49.32%°	36.08%	52.25%°
Unexplained returns	N/A	-58.13%	-70.26%	-30.16%	-43.68%
Total return	N/A	24.07%	24.07%	24.07%	24.07%

Table 3.5: Event study approach for Phase 2: Enter tourism (1997-2001)

This table displays cumulative abnormal log returns (CARs) over the event windows of several groups of events over phase 2 from June 11, 1997 to September 10, 2001. The 'number of events' is the number of days on which events of the respective event group took place. Note that this number can be lower than the corresponding number in Table 3.4, because days on which more than one event (from different event groups) took place are classified as 'Multiple events' here. Around these days, event windows are fitted, and abnormal returns are cumulated across these windows. °, *, **, *** marks significance at the 15%, 10%, 5%, and 1% significance level, respectively. Results are displayed for four different event windows (*-x*, *y*) from *x* days before to *y* days after the event. Panel A presents regression results for abnormal returns calculated relative to the Frankfurt market portfolio CDAX. Panel B contains similar results when abnormal returns are calculated relative to our weighted industry benchmark. The table also shows a breakdown of the CARs of tourism acquisitions into the CARs of tourism acquisitions from WestLB and the CARs of other tourism acquisitions.

Panel A: Abnormal returns relative to the market index (CDAX)

Event group	Number of events	Event window			
		(0, 1)	(-1, 1)	(0, 2)	(-1, 2)
Tourism acquisitions	27	-12.61%	-34.51%**	-10.32%	-25.15%°
from WestLB	6	9.92%°	6.59%	12.97%*	9.64%
other	21	-22.53%**	-41.10%***	-23.29%*	-34.79%**
Other acquisitions	9	14.02%*	6.05%	16.75%*	7.80%
Sell-offs	20	40.52%***	47.67%***	21.51%°	34.48%**
Tourism news	8	5.04%	23.14%***	13.24%*	23.78%***
Other news	68	13.43%	17.10%	23.67%	25.46%
Multiple Events	6	8.38%	16.07%°	-8.12%	1.97%
Days without events	939	-46.65%	-53.40%	-34.60%	-46.21%
Sum	1077	22.13%	22.13%	22.13%	22.13%

Panel B: Abnormal returns relative to weighted industry benchmark

Event group	Number of events	Event window			
		(0, 1)	(-1, 1)	(0, 2)	(-1, 2)
Tourism acquisitions	27	-12.51%	-34.37%**	-12.62%	-23.66%°
from WestLB	6	8.47%	6.96%	11.19%*	9.67%
other	21	-20.98%*	-41.32%***	-23.81%*	-33.33%**
Other acquisitions	9	14.64%**	11.76%	14.01%*	11.84%
Sell-offs	20	35.41%***	45.29%***	12.94%	29.74%**
Tourism news	8	-0.16%	10.66%	6.77%	10.54%
Other news	68	24.41%	22.76%	25.21%	27.07%
Multiple Events	6	13.30%*	16.77%°	6.10%	6.94%
Days without events	939	-51.03%	-48.80%	-28.34%	-38.41%
Sum	1077	24.07%	24.07%	24.07%	24.07%

Table 3.6: Preussag's abnormal returns in Phase 3: Consolidate tourism (2001-2004)

This table presents the results of eight regressions of Preussag's daily abnormal log returns over phase 3 from September 11, 2001 to December 31, 2004 on an intercept and five dummy variables: *tourism acquisitions*, *other acquisitions*, *sell-offs*, *tourism news*, and *other news*. The dummy variables are set equal to one on every day of the event windows around the events they indicate. The table reports the estimated regression coefficients multiplied by the number of days the respective dummy variable is equal to one. *Unexplained return* is the estimated intercept multiplied by the number of observations in the regression. °, *, **, *** marks significance at the 15%, 10%, 5%, and 1% significance level, respectively. Results are displayed for four different event windows (-*x*, *y*) from *x* days before to *y* days after the event. Panel A presents regression results for abnormal returns calculated relative to the Frankfurt market portfolio CDAX. Panel B contains similar results when abnormal returns are calculated relative to our weighted industry benchmark.

Panel A: Abnormal returns relative to the market index (CDAX)

Event group	Number of events	Event window			
		(0, 1)	(-1, 1)	(0, 2)	(-1, 2)
Tourism acquisitions	11	5.07%	1.69%	10.32%	6.81%
Other acquisitions	1	1.89%	3.61%	1.21%	3.07%
Sell-offs	22	-4.53%	-14.92%	-13.79%	-24.12%
Tourism news	36	-20.45%	-16.92%	-16.38%	-9.36%
Other news	101	22.88%	55.36%	30.24%	82.95%°
Unexplained returns	N/A	-54.71%	-78.66%	-61.44%	-109.18%
Total return	N/A	-49.84%	-49.84%	-49.84%	-49.84%

Panel B: Abnormal returns relative to weighted industry benchmark

Event group	Number of events	Event window			
		(0, 1)	(-1, 1)	(0, 2)	(-1, 2)
Tourism acquisitions	11	-3.29%	-5.67%	-1.02%	-3.47%
Other acquisitions	1	2.23%	1.94%	3.08%	2.87%
Sell-offs	22	-13.28%	-29.12%°	-15.59%	-31.96%°
Tourism news	36	-12.30%	-7.21%	-1.10%	3.68%
Other news	101	36.00%	56.54%	38.91%	71.10%
Unexplained returns	N/A	-89.96%	-97.09%	-104.88%	-122.82%
Total return	N/A	-80.60%	-80.60%	-80.60%	-80.60%

Table 3.7: Return of a hypothetical liquidation of Preussag

This table displays the evolvement and the (actual) returns of two hypothetical liquidation strategies of Preussag AG. The hypothetical strategy starts on September 30, 1997. From then on, all free cash flows including all proceeds from sell-offs are assumed to be paid out to shareholders and invested either in the tourism and transportation index or in the market index (CDAX). Index returns are actual returns and not log returns. No new acquisitions are made, and the existing debt is repaid on September 30, 1997. For each date, the value of the investment in the index of all cash flows that have previously been paid out is shown in the column 'value'. For a few smaller sell-offs, we could not obtain the proceeds, so we set the cash inflow equal to zero. For the remaining subsidiaries on December 31, 2004, we use prices obtained after December 31, 2004 or balance sheet data.

Date	Description of inflow	Inflow	Investment in Tourism and Transport		Investment in market index	
			Index return	Value	Index return	Value
09/30/97	Liquid assets (1,093) minus debt (852) at the end of fiscal year 1996/97	241.0		241.0		241.0
01/12/98	Preussag sells steel business	542.0	0.38%	783.9	-2.73%	776.4
04/20/98	Preussag sells its uranium business (share 50%)	153.0	24.64%	1,130.0	30.34%	1,165.0
06/02/98	Preussag sells a company from its components business	0.0	2.60%	1,159.5	2.31%	1,191.9
09/30/98	Operating cash flow without tourism and logistics	116.9	-27.99%	951.8	-19.06%	1,081.7
10/20/98	Preussag sells its recycling unit	0.0	3.76%	987.6	1.84%	1,101.6
11/11/98	Preussag sells part of its plant construction business	0.0	2.38%	1,011.1	3.37%	1,138.8
01/01/99	Preussag sells its coal mine	82.0	7.56%	1,169.6	5.05%	1,278.3
01/05/99	Preussag sells the mining and engineering company Deilmann-Haniel (share: 50.2%)	29.0	0.35%	1,202.7	4.19%	1,360.8
03/15/99	Preussag sells 100% of its plant construction unit and 50% of the shipbuilding unit	322.0	14.85%	1,703.3	-3.22%	1,638.9
09/08/99	Preussag sells 4.6% of Metaleurop S.A.	10.0	1.23%	1,734.3	6.55%	1,756.3
09/30/99	Operating cash flow without tourism and logistics	233.5	-5.01%	1,880.8	-4.66%	1,908.0
03/27/00	Preussag sells 8.6% of Metaleurop S.A.	20.0	7.61%	2,044.1	49.36%	2,869.8
09/30/00	Operating cash flow without tourism and logistics	494.1	-5.67%	2,422.3	-14.55%	2,946.4
10/05/00	Preussag sells part of its trading business	58.0	1.11%	2,507.3	0.60%	3,022.0
12/31/00	Operating cash flow without tourism and logistics	139.4	-2.82%	2,575.9	-11.58%	2,811.4
12/31/00	Preussag sells 6800 apartments	162.0	0.00%	2,737.9	0.00%	2,973.4
03/30/01	Preussag sells the fire protection firm Minimax	276.0	-4.65%	2,886.5	-7.16%	3,036.6
03/30/01	Preussag sells 400 apartments	10.0	0.00%	2,896.5	0.00%	3,046.6
04/26/01	Preussag sells the sanitary equipment producer Kermi Group	140.0	1.73%	3,086.7	4.28%	3,317.0
06/22/01	Preussag sells its construction materials unit Fels Group	750.0	1.75%	3,890.6	-1.72%	4,010.1

Date	Description of inflow	Inflow	Investment in Tourism and Transport		Investment in market index	
			Index return	Value	Index return	Value
07/06/01	Preussag sells most of its heating technology business	300.0	0.38%	4,205.3	-2.00%	4,229.9
07/16/01	Preussag sells part of its oil and gas exploration and its stake in Ruhrgas AG	350.0	-1.07%	4,510.4	-0.28%	4,568.1
08/23/01	Preussag sells the storage specialist KBB	21.0	-2.90%	4,400.6	-8.24%	4,212.7
08/31/01	Preussag sells its oil drilling business (Deutag Group)	210.0	-1.11%	4,562.0	-1.32%	4,367.2
12/31/01	Operating cash flow without tourism and logistics	402.2	-6.94%	4,647.5	-0.30%	4,756.5
03/11/02	Preussag sells the remaining 50% of its shipbuilding unit (HDW AG)	400.0	10.14%	5,518.8	3.61%	5,328.1
06/06/02	Preussag sells part of its components business	0.0	-5.28%	5,227.6	-10.07%	4,791.4
07/01/02	Preussag sells its software subsidiary	0.0	-3.40%	5,049.8	-5.16%	4,544.4
12/06/02	Preussag sells its electric-chemical business (share: 50%)	0.0	-11.33%	4,477.8	-25.34%	3,392.9
12/19/02	Preussag sells 14000 apartments	260.0	-3.42%	4,584.5	-7.34%	3,403.7
12/27/02	Preussag sells its domestic oil business	1000.0	-2.39%	5,474.8	-3.70%	4,277.7
12/31/02	Operating cash flow without tourism and logistics	190.3	0.66%	5,701.1	1.76%	4,543.2
01/22/03	Preussag sells its foreign oil business	300.0	-5.13%	5,708.8	-2.58%	4,726.0
09/11/03	Preussag sells a large part of its trading business	200.0	28.76%	7,550.9	27.78%	6,238.9
09/19/03	Preussag sells its 24% stake in a power plant	0.0	2.84%	7,765.4	0.52%	6,271.3
12/31/03	Operating cash flow without tourism and logistics	38.9	3.22%	8,054.4	9.95%	6,934.0
03/31/04	Lehnkering AG (100%)	250.0	7.12%	8,877.8	-1.32%	7,092.7
07/19/04	Algeco S.A. market capitalization (67%)	320.0	4.01%	9,553.4	-0.83%	7,353.5
12/31/04	Operating cash flow without tourism and logistics	129.1	7.98%	10,445.2	10.84%	8,279.6
12/31/04	VTG AG (100%)	400.0	0.00%	10,845.2	0.00%	8,679.6
12/31/04	Metal trading unit (PNA Group)	414.4	0.00%	11,259.6	0.00%	9,094.0
12/31/04	Wolf GmbH (80%)	16.0	0.00%	11,275.6	0.00%	9,110.0
12/31/04	Preussag Immobilien GmbH (100%)	96.4	0.00%	11,372.1	0.00%	9,206.4

Table 3.8: Management compensation at Preussag

This table displays the average number of officers on Preussag's management board and their total and their average compensation for each fiscal year. In 2001, Preussag changed its end of fiscal year from September 30 to December 31. The table does not report the compensation for the shortened fiscal year that consisted only of the last quarter of 2000.

Fiscal year	Average number of officers	Compensation (€ '000)	
		Total	Average
1993/94	8.25	4,337	526
1994/95	8.00	5,157	645
1995/96	8.00	5,227	653
1996/97	8.00	5,024	628
1997/98	6.50	5,232	805
1998/99	4.00	5,163	1,291
1999/00	4.00	6,323	1,581
2001	6.00	8,165	1,361
2002	6.00	10,222	1,704
2003	5.17	9,342	1,808
2004	4.00	7,969	1,992

Table 3.9: Voting rights at Preussag's AGM controlled by WestLB

This table displays the percentage of Preussag's equity capital that was represented at Preussag's Annual General Meetings (AGM) from 1995 to 2004. It also shows the proportion of these voting rights that were controlled by WestLB alone or by WestLB and Niedersachsen Holding (NH). WestLB held a 33.3% stake in Niedersachsen Holding (see Figure 3.1A). Niedersachsen Holding was dissolved by the end of 1998.

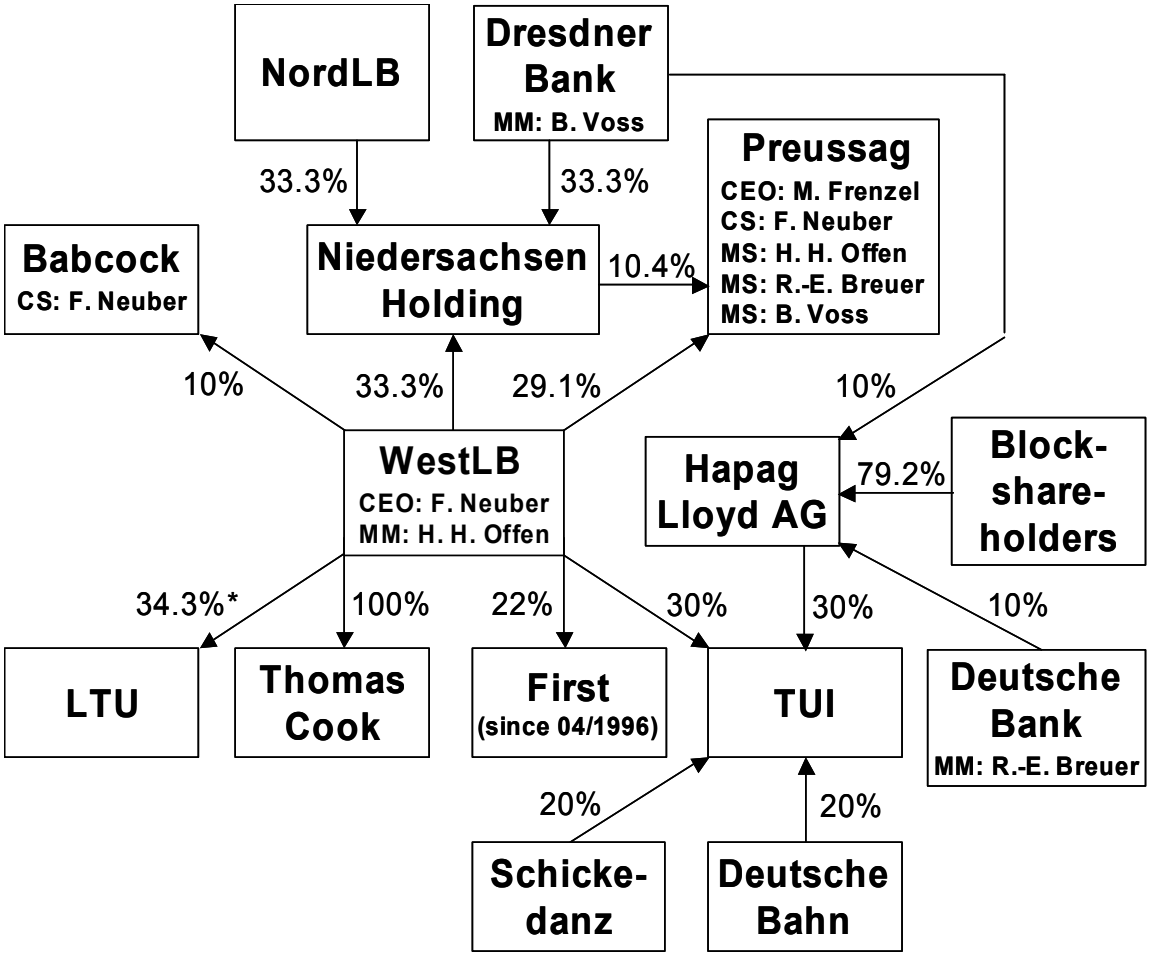
Date of AGM	Capital represented at AGM	Voting rights at the AGM held by	
		WestLB	WestLB and NH
24. Mar. 1994	N/A	N/A	N/A
30. Mar. 1995	70.3%	41.4%	56.2%
21. Mar. 1996	74.0%	39.3%	53.4%
26. Mar. 1997	66.5%	43.8%	59.4%
26. Mar. 1998	65.5%	44.5%	60.3%
31. Mar. 1999	67.0%	49.3%	
12. Apr. 2000	39.0%	84.6%	
18. May 2001	37.2%	88.8%	
26. Jun. 2002	42.2%	78.2%	
18. Jun. 2003	54.0%	61.1%	
18. May 2004	54.3%	60.8%	
Average:	57.0%	59.2%	

9 Figures

Figure 3.1: Description of the WestLB/Preussag network

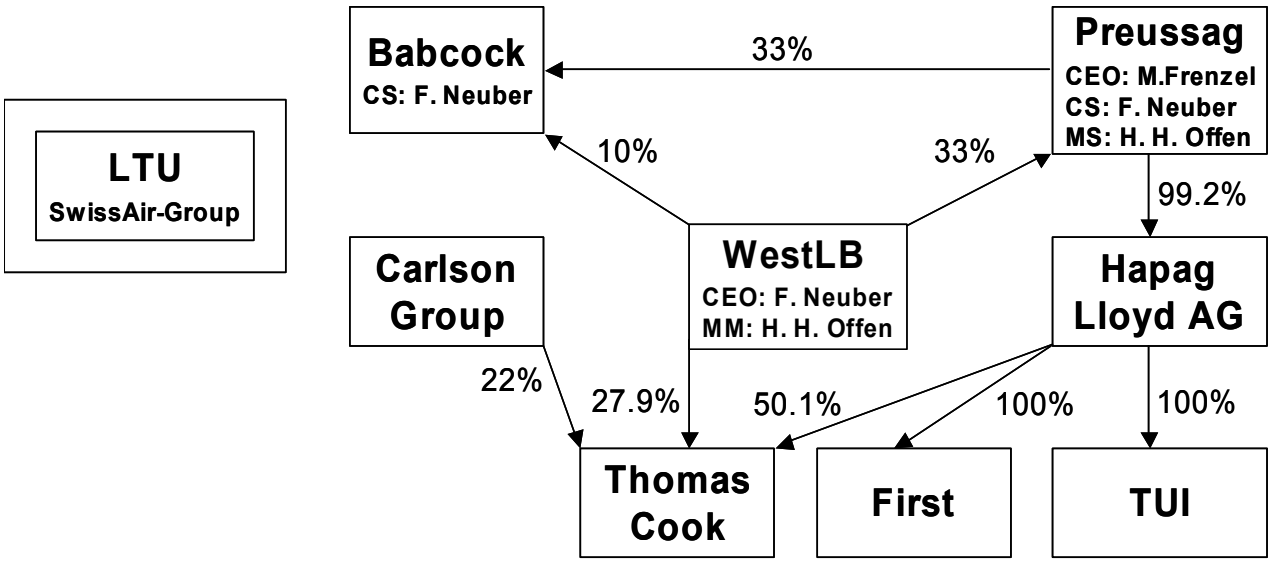
The following figures show the cross-holdings and interlocking directorates in the WestLB/Preussag network at three points in time during the period 1994 to 2004. The percentages next to the arrows provide the voting rights of the firm at the start of the arrow in the firm at the tip of the arrow. The figures also list selected members of the executive and the supervisory boards. MM stands for 'member of the management board', CS for 'chairman of the supervisory board', and MS for 'member of the supervisory board.'

Panel A: January 1994 until June 1997



* According to Handelsblatt from June 5, 1992, WestLB holds 34.3% of LTU's cash-flow rights but has the majority of the voting rights.

Panel B: December 1999



Panel C: December 2004

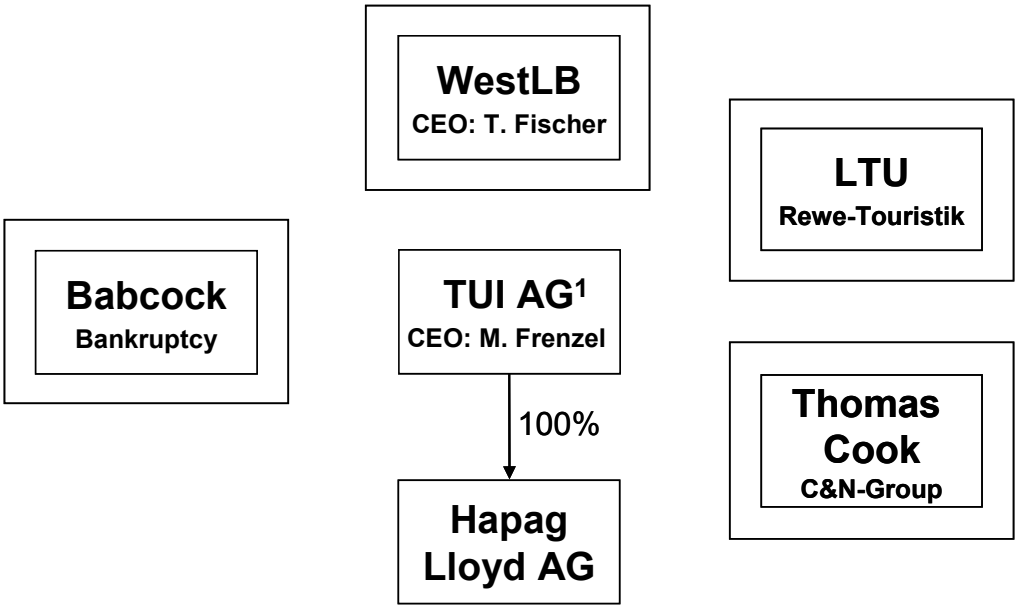
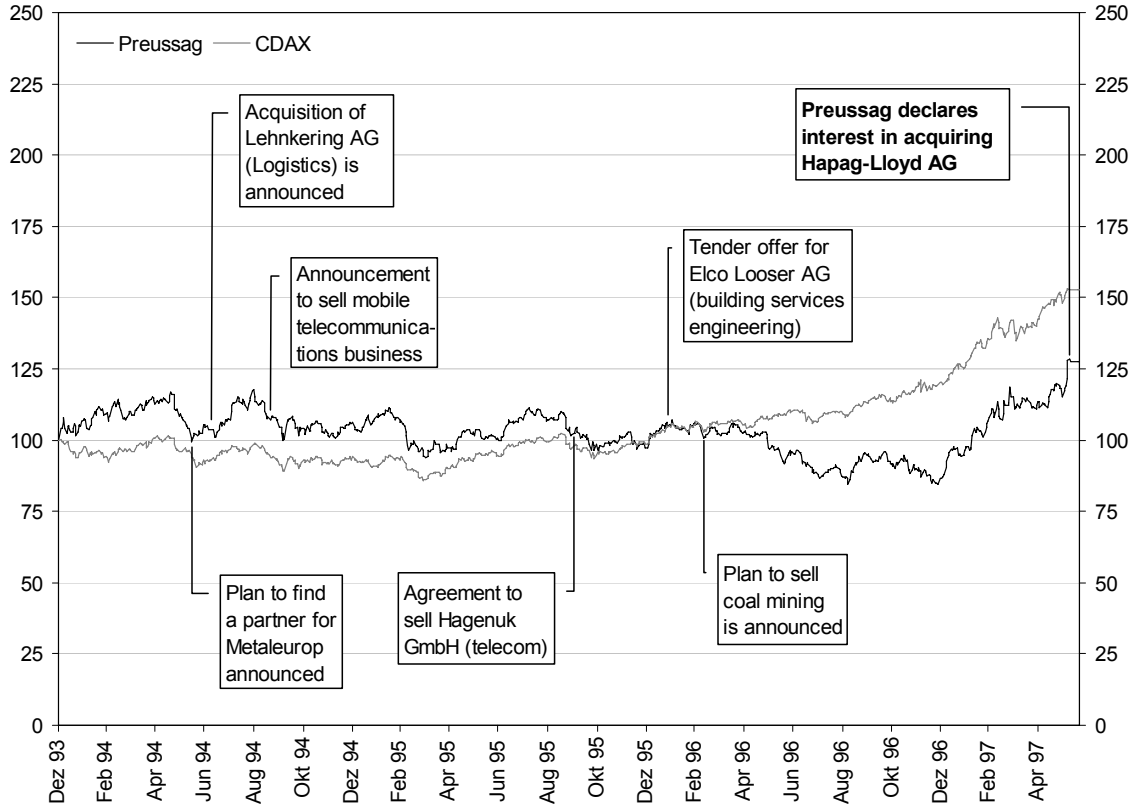


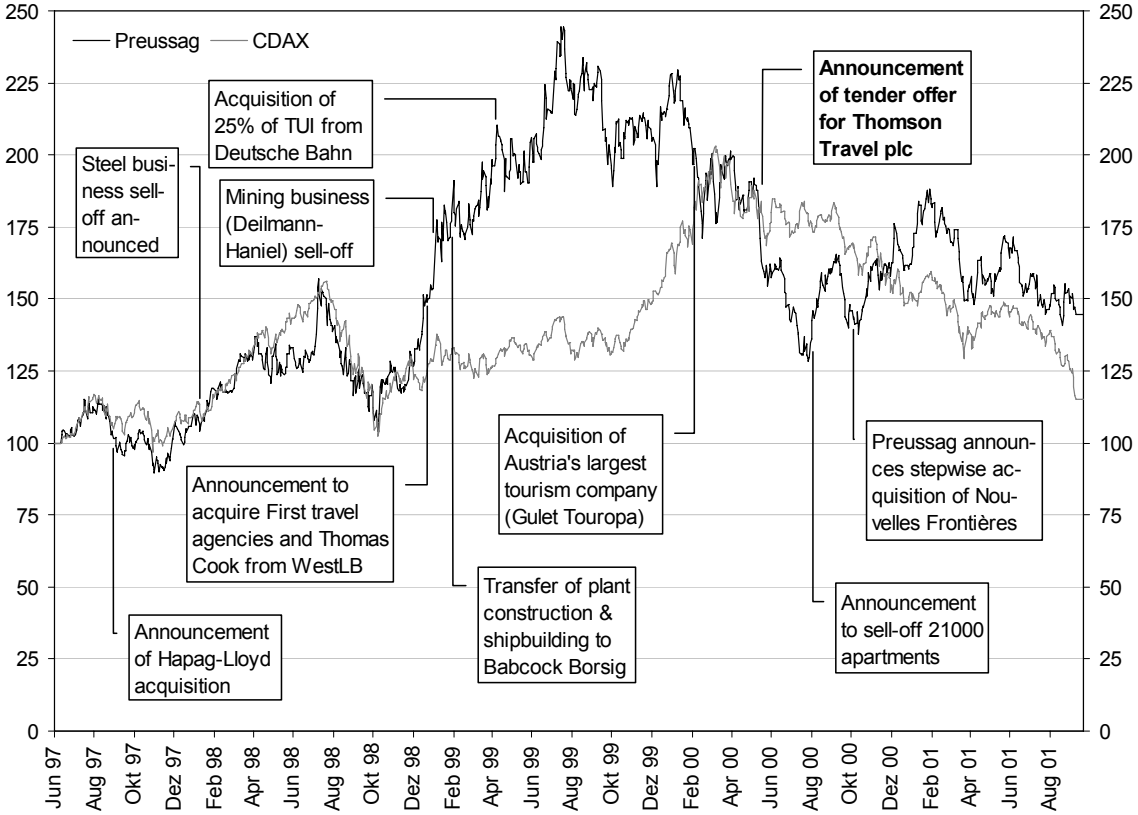
Figure 3.2: Preussag's stock price history

The three figures show Preussag's performance index ('Preussag') and the German stock market's performance index ('CDAX') over the decade from January 1994 to December 2004. Both series are normalized to 100 on January 1, 1994, June 11, 1997, and September 11, 2001.

Panel A: Preussag's stock price from January 1, 1994 to June 10, 1997



Panel B: Preussag's stock price from June 11, 1997 to September 10, 2001



Panel C: Preussag's stock price from September 11, 2001 to December 31, 2004

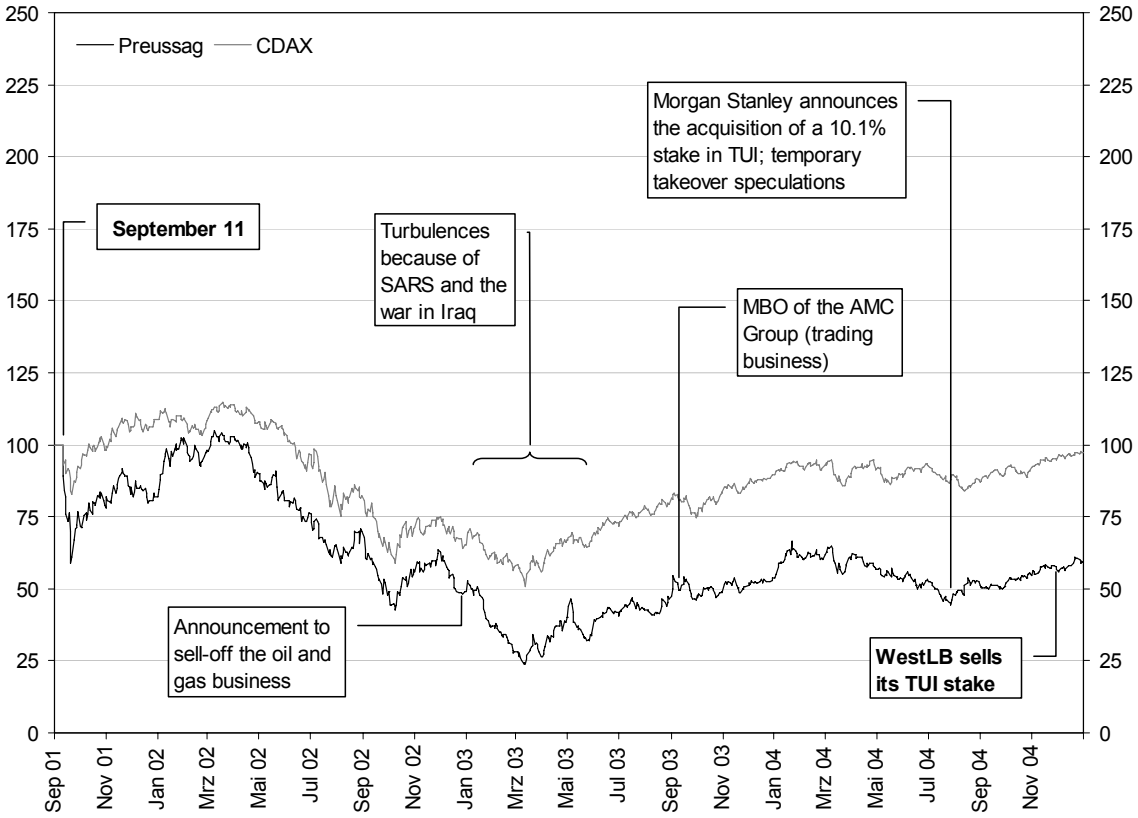
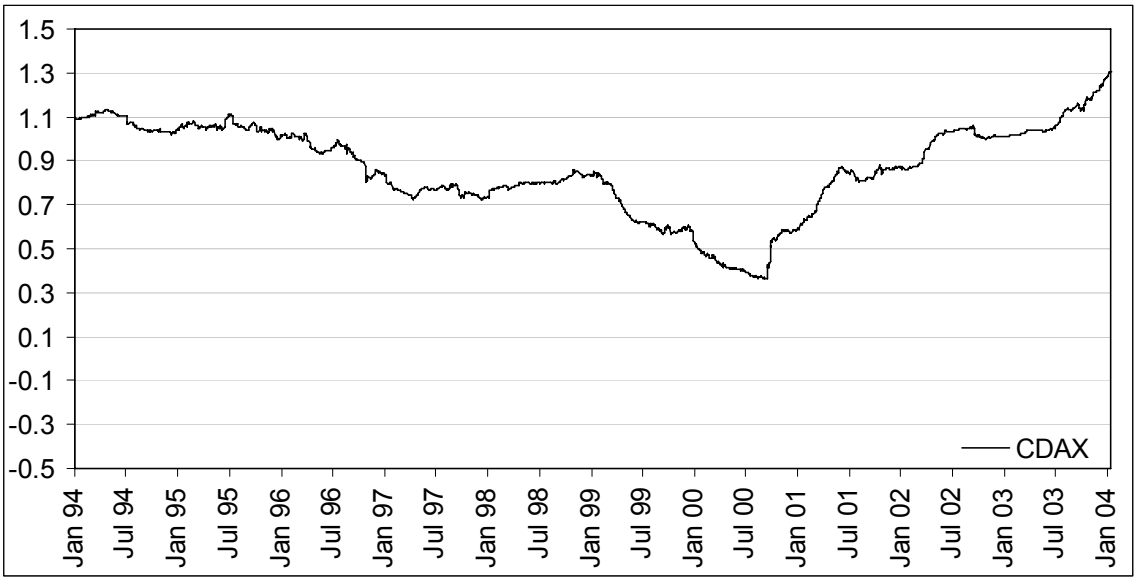


Figure 3.3: Correlations of Preussag's stock with the market and with industry portfolios

Panel A shows the regression coefficient of a regression of Preussag's daily stock returns on the daily CDAX returns and an intercept over a 500 trading day moving window (-250 to +250 days). The intercept is not displayed in the figures. Panel B shows the results of a similar regression on the returns of the tourism and transport index and the steel and engineering index.

Panel A: Regression coefficient of Preussag's returns on the market return



Panel B: Regression coefficients of Preussag's returns on the returns of two industry portfolios

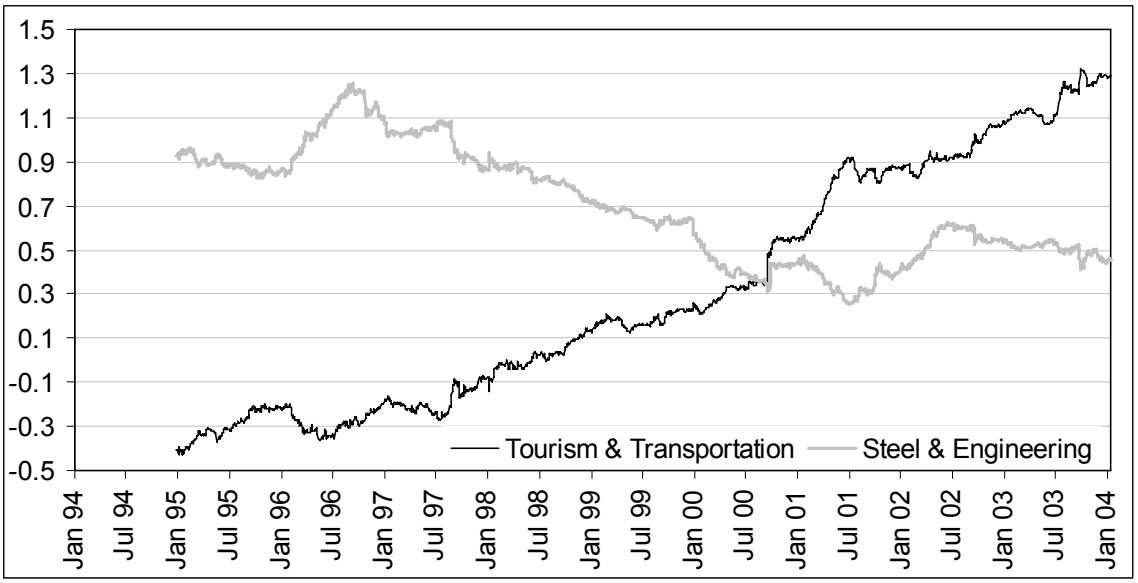
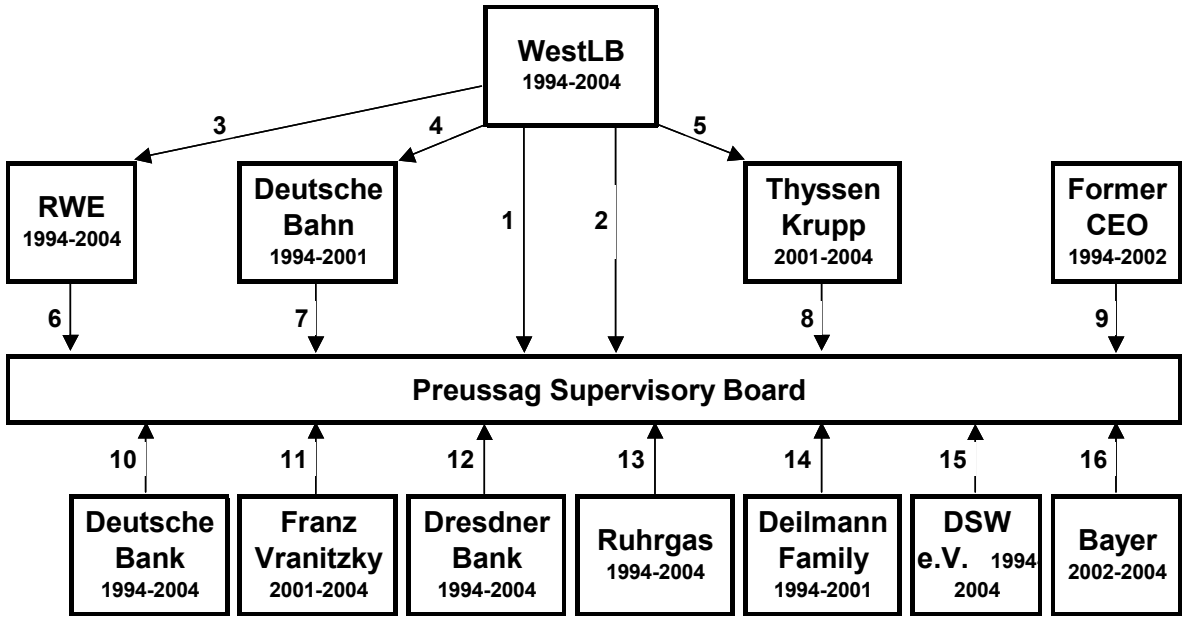


Figure 3.4: Preussag's supervisory board and board overlaps

This figures displays the firms, organizations and individuals that were represented in Preussag's supervisory board between 1994 and 2004. Three of these firms had themselves a WestLB representative on their supervisory board. Details on the individual interlocks are provided in the footnotes. MM stands for 'member of the management board', CS for 'chairman of the supervisory board', and MS for 'member of the supervisory board.'



(1) Friedel Neuber: CEO of WestLB (until 2001), CS of Preussag (died 10/23/2004), followed by Norbert Emmerich (11/5/2004 - 1/26/2005); new chairman Jürgen Krumnow (since 11/10/2004).
(2) Hans Henning Offen: MM of WestLB (until 2002); Since Mr. Offen left Preussag's supervisory board (6/18/2003), WestLB was represented by Jürgen Sengera (6/18/2003 - 8/21/2003), followed by Johannes Ringel (9/8/2003 - 1/12/2004) and Thomas Fischer (CEO) (1/16/2004 - 1/26/2005).
(3) Friedel Neuber: Chairman of RWE's supervisory board (died 10/23/2004), followed by Thomas Fischer; H.-H.Offen: Supervisory board memberships of a subsidiary of RWE.
(4) Friedel Neuber: Member of Deutsche Bahn's supervisory board (died 10/23/2004).
(5) Friedel Neuber: Chairman of ThyssenKrupp's supervisory board (died 10/23/2004); H.-H.Offen: Supervisory board memberships of a subsidiary of ThyssenKrupp.
(6) Herbert Krämer: MM of RWE and MS of Preussag (until 1996). Dietmar Kuhnt: CEO of RWE and MS of Preussag (1996-2003).
(7) Heinz Dürr: CEO of Deutsche Bahn (until 1997) and CS of Deutsche Bahn (1997-1999).
(8) Ekkehard Schulz: CEO of ThyssenKrupp.
(9) Günther Saßmannshausen: Former CEO of Preussag (until 1988).
(10) Rolf-E. Breuer: CEO of Deutsche Bank and MS of Preussag (until 1997). Jürgen Krumnow: MM of Deutsche Bank (until 1999), Advisor of Deutsche Bank (since 2000) and MS of Preussag (since 1997). Deutsche Bank sold their 10% stake in Hapag-Lloyd to Preussag in 1997.
(11) Franz Vranitzky: Former Austrian Chancellor and member of the Austrian Social Democratic Party.
(12) Bernd W. Voss: MM (until 2001) and MS (since 2002) of Dresdner Bank. Dresdner Bank sold their 10% stake in Hapag-Lloyd to Preussag in 1997.
(13) Klaus Liesen: CEO of Ruhrgas (until 1996) and CS of Ruhrgas (since 1996).
(14) Hans Carl Deilmann: Owner and CEO of C.Deilmann AG, a company taken over by Preussag in several steps during the 1980s and early 1990s, MS of Preussag (until 1996). Jürgen Deilmann: CEO of Deilmann-Montan GmbH and MS Preussag (1997-2001).
(15) Gerold Bezzenberger: MM of DSW, a German investor protection association, and MS of Preussag (until 2001). Jella S. Benner-Heinacher: CEO of DSW and MS of Preussag (2001-2004).
(16) Manfred Schneider: CS of Bayer.

Chapter IV

Defensive Mergers and Acquisitions

1 Introduction

There have been many studies on the profitability of mergers and acquisitions over the last decades.[100] The overwhelming evidence from these papers is that acquirer announcement returns are on average close to zero or even negative (see, for example, Moeller, Schlingemann, and Stulz, 2004; Andrade, Mitchell, and Stafford, 2001).[101] In this chapter, I present a new explanation for this well-known empirical result and hypothesize that firm size is an important factor for the survival of a stock corporation and because of that, otherwise inactive ("quiet life") managers engage in defensive takeovers to secure their independence.

A number of explanations have been put forward to explain the finding that many takeovers lead to the destruction of shareholder wealth in bidding firms. Roll (1986) argues that acquiring firms often overvalue target companies and then overpay for them because their managers are prone to hubris. Another explanation of value decreasing acquisitions is Jensen's free cash flow theory (Jensen, 1986). It predicts that firms with substantial free cash flows and few profitable investment projects will engage in value reducing acquisitions, because the growth of the company is of major importance to managers even if firms grow beyond their optimal size. A very direct reasoning is based on the empirical fact that compensation is often linked

[100] I thank seminar participants at the University of Mannheim and especially Susanne Ebert, Ernst Maug and Oliver Spalt for helpful comments and discussions. I gratefully acknowledge financial support of the collaborative research center TR/SFB 15 "Governance and the Efficiency of Economic Systems" at the University of Mannheim. All tables are gathered at the end of the chapter.

[101] Studies finding negative average abnormal returns to acquirers are Dodd (1980), Varaiya and Ferris (1987), Bradley, Desai, and Kim (1988), Jennings and Mazzeo (1991), Servaes (1991), Banerjee and Owers (1992), Byrd and Hickman (1992), Kaplan and Weisbach (1992), Mitchell and Stafford (2000). For a recent survey of the literature, see Bruner (2004).

to size and managers have therefore strong incentives to increase firm size even if it is not beneficial for shareholders. Besides indirect private benefits from acquisitions caused by increased firm size or growth, also direct private benefits from acquisitions may exist and mislead managers to value destroying takeovers. Increased prestige and status from extensive press coverage of large acquisitions are examples of these direct private benefits. The unifying idea behind all these explanations of value destroying acquisitions is that managers are interested in takeovers in order to maximize their power, prestige, and (monetary and non-monetary) compensation.

In contrast, Bertrand and Mullainathan (2003) argue that the average manager is not interested in empire building but in enjoying the quiet life. They find for U.S. plant level data that when managers are insulated from the market for corporate control because of statewide anti-takeover laws worker wages rise, destruction of old plants and the creation of new plants decrease without any net effect on firm size.[102] These results do not fit well with the idea that managerial preferences are inclined to empire building. Instead, it seems that poorly governed managers prefer to avoid difficult decisions and costly efforts, like bargaining with unions, engaging in layoffs or finding new profitable projects. I will refer to managers, who are mostly interested in avoiding tasks, which cause considerable effort and may require difficult decisions as quiet-life managers. Incidentally, this kind of behavior also seems to be in dissent with the hypothesis that an average manager is prone to hubris. However, if empire building and hubris are not the driving forces behind the actions of an average manager the question remains, why we see so many value destroying acquisitions.[103]

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[102] Giroud and Mueller (2009) find that managers not exposed to product market completion and takeover threats prefer the quiet life. Cronqvist, Heyman, Nilsson, Svaleryd, and Vlachos (2007) find for a Swedish data set that entrenched CEOs pay their workers more. They suggest that entrenched CEOs pay higher wages to enjoy private benefits from lower wage bargaining and better social relations. These results are consistent with entrenched CEOs preferring the quiet life.

[103] Negative bidder announcement returns can also be explained without managers being prone to hubris or following their own objectives instead of shareholder value maximization. For example, if takeover announcements reveal negative information about the bidder's profitability relative to expectations (see McCardle and Viswanathan, 1994; Jovanovic and Braguinsky, 2004).

One possible explanation would be that a relatively small number of managers prone to hubris or empire building undertake a large proportion of all takeover transactions. There is anecdotal and empirical evidence supporting this explanation. Moeller, Schlingemann, and Stulz (2004), for example, find that large firms, whose managers are likely to be more prone to hubris or empire building, undertake (and complete) more acquisitions, pay higher premiums and create lower synergy gains than small firms. Malmendier and Tate (2008) find that CEOs, who are overconfident (or prone to hubris), undertake more acquisitions and destroy more shareholder value with these transactions than non-overconfident (rational) CEOs. However, it has not been shown that other kinds of managers are not inclined to execute value-destroying acquisitions.

Morck, Shleifer, and Vishny (1990) investigate personal objectives of managers that lead to acquisitions that reduce (acquiring firm) shareholder value. Morck et al. identify four major managerial objectives, which are (1) assuring the continuity of the firm, (2) improving their own job security, (3) diversifying the risk to their own human capital, and (4) creating attractive career opportunities for insiders.[104] To achieve these objectives managers undertake diversifying acquisitions and try to buy growing firms. But not only empire builders are interested in the continuity of their firms and the security of their jobs, also managers who are usually enjoying the quiet life should have this interest. Therefore, we should observe that quiet-life managers are willing to undertake value-reducing acquisitions if the independence of their firms and the security of their jobs are threatened. In contrast to empire builders who are mainly interested in acquisitions to maximize the assets under their control, quiet-life managers are only interested in acquisitions in order to defend their jobs (future compensation) and the private benefits associated with these jobs. These private benefits could be social status and prestige associated with their management role as well as all kinds of non-cash compen-

[104] See also Amihud and Lev (1981) and May (1995).

sation items, like corporate jets, golf club memberships, sponsoring of their favorite sports team or cultural institution by the firm.

Gorton, Kahl, and Rosen (2005) present a model of defensive mergers, where managers can reduce the likelihood of being acquired by acquiring competitors. The increased size of their own firm essentially acts as a takeover defense.[105] Then they show that if managers care sufficiently about private benefits of control, they may undertake unprofitable acquisitions in order to retain their jobs. Gorton et al. call these transactions defensive acquisitions, because they would not happen in the absence of a takeover threat.

Based on their theoretical model, Gorton et al. make a number of empirical predictions about the influence of industry structure and firm size on the dynamics and the profitability of mergers and acquisitions. Their predictions that acquirer size, deal size, and relative size of the target and the acquirer are negatively correlated with acquirer returns are also consistent with other merger theories and largely corroborated by empirical results (see, for example, Moeller, Schlingemann, and Stulz, 2004). However, the model of Gorton et al. has some additional implications. They argue that the firm size distribution in an industry is an important driver of merger activity. In industries with firms of similar size (homogeneous firm size industries) defensive acquisitions are more likely because mergers between most firms in these industries would create a new market leader (or at least a large enough firm to protect future independence) and therefore have considerable defensive value for management. In contrast, industries with firms of very different sizes (heterogeneous firm size industries) are less likely to exhibit defensive acquisitions, because most firms could not increase their size enough by merging with competitors to protect themselves from future takeovers. There are two implications from this observation. First, the model of Gorton et al. predicts ceteris paribus the lowest

[105] There is empirical evidence that the probability of becoming a target in an acquisition is decreasing in firm size, see, for example, Hasbrouck (1985), Palepu (1986) or Trimbath, Frydman, and Frydman (2001). The standard explanation for this finding is the difficulty to finance large takeover transactions in particular if the target is larger than the acquirer is.

acquirer returns for homogeneous firm size industries and the highest for heterogeneous firm size industries. Second, in industries classified neither as homogenous nor heterogeneous (mixed firm size industries) we should observe most mergers, because firms engage in defensive as well as in value enhancing acquisitions. Since both types of acquisitions are probable the acquirer returns in mixed firm size industries should be larger than in homogenous but lower than in heterogeneous firm size industries.[106]

In this chapter, I will show that there is only limited empirical evidence for Gorton et al.'s prediction that the negative effects of defensive transactions on shareholder value can be detected by classifying industries according to their firm size distribution. However, I find strong evidence that firms that are likely to be managed by quiet-life managers undertake worse acquisitions than an average firm does. I interpret this finding as support for the hypothesis that not only empire building and overconfident managers are destroying shareholder value with acquisitions, but also defensive transactions of managers usually enjoying the quiet life.

The major empirical challenge is to identify the different types of managers. Ideally, one would identify and track individual managers over time and infer from their behavior which type they are.[107] This procedure would require a relatively long time series with information about the identity of officers (and possibly directors) of a large number of firms in the sample. The data requirements would be different across countries. For the U.S., where the role of the CEO is comparably strong and most strategic decisions are mainly influenced by her, it would probably suffice to track her identity. In countries like Germany, where the role of the CEO is less powerful and most decisions are made by the management board collectively, it would be necessary to track the identity of all officers in the management board. In other countries, like

[106] The model of Gorton et al. does not make any particular predictions about the size of target returns across different industries.

[107] Malmendier and Tate (2008) choose this approach to identify overconfident CEOs for a U.S. data set by using data on early option exercises and characterizations in the press and then investigate the profitability and number of acquisitions undertaken by these CEOs.

Japan with its Keiretsu structure maybe even more persons have to be followed. Given the fact that there is no such database for other countries than the U.S. currently available, I decided to resort to a different identification scheme, which allows me carry out the analysis for an international data set of mergers and acquisitions.[108] Since I cannot track the identity of managers, I do not attempt to classify them directly.

Instead, I classify the acquisitions undertaken by them based on prior acquisition activity of their firm and the primary industry their firm is operating in. Acquisitions are classified as undertaken by quiet-life managers, if three conditions hold: (1) the firm was relatively inactive in the market for corporate control during the preceding two calendar years before executing this acquisition, (2) the target operates in the same primary industry as the acquirer, and (3) the acquisition takes place in a period (last and current year) of high takeover activity in the primary industry of the firm. The first two conditions follow from the definition of quiet-life managers, who prefer to avoid difficult decisions and costly effort and therefore will not undertake many or large acquisitions, in particular not in industries they are not familiar with. The third condition is based on the notion that quiet-life managers only become active in the market for corporate control if there is a threat of being taken over. This threat is of course particularly large during times when merger activity is high in an industry. In contrast, I classify acquisitions as undertaken by empire-building managers, if the following condition holds: the firm was relatively active in the market for corporate control during the preceding two calendar years before executing this acquisition. This definition naturally follows from the idea that empire-building managers are interested in maximizing assets under management and therefore undertake acquisitions quite frequently. I do not classify acquisitions undertaken by overconfident managers, because using this identification scheme they are indistinguishable from acquisitions undertaken by empire-building managers. However, this problem does not influence the definition of acquisitions undertaken by quiet-life managers and therefore

[108] For the U.S. it is possible to track the five highest paid executives via Compustat's ExecuComp database.

should not influence the results with regard to this group. Of course, the proposed identification procedure is only indirect. Nonetheless I do not see any reason why the results should be systematically biased, which would invalidate the approach.

The contribution of this chapter to the literature is threefold. First, I test with a global data set of mergers and acquisitions whether the essential assumption of Gorton et al. for the existence of defensive acquisitions holds: the probability of becoming a takeover target is decreasing in firm size. Prior studies have often found a negative relation between size and takeover probability (e.g., Hasbrouck, 1985; Palepu, 1986). However, this literature mainly used logit and probit regressions to analyze takeover data.[109] This chapter employs the hazards regression model proposed by Cox (1972), which is a sub-class of survival models. In contrast to static logit or probit models, where the dependent variable is a binary variable (target vs. non-target), in the Cox model the dependent variable is the duration until a firm becomes a target. The Cox model has two major advantages over static logit and probit models. First, it easily incorporates time-varying covariates (e.g., annually changing firm characteristics). Second, it accommodates the censoring problem present in takeover data. Whereas logit and probit models treat all firms, which have not experienced a takeover until the end of the sample period as non-targets, the Cox model treats these firms just as not taken over yet. The first and only study using the Cox model in the context of mergers and acquisitions is to the best of my knowledge Trimbath, Frydman, and Frydman (2001). However, their focus is more on the influence of cost inefficiencies on takeover risk and they apply it to a much smaller and older domestic U.S. data set.[110]

The second contribution of this chapter is to test the empirical predictions of the Gorton et al. model about defensive transactions. There has been ample empirical research on other mana-

[109] An example for using probit models in the context of takeovers is Morck, Shleifer, and Vishny (1988). Logit models are used by Hasbrouck (1985), Palepu (1986), Barnes (1999), and more recently Brar, Giamouridis, and Liodakis (2009).

[110] Their data set only includes Fortune 500 firms in the period between 1980 and 1997.

gerial merger theories but defensive transactions initiated by managers to retain their jobs and private benefits have not been studied much so far. Louis (2004) analyzes defensive takeovers in the U.S. banking sector. Other managerial merger theories have attracted considerably more empirical research. A recent study testing the hubris hypothesis is Malmendier and Tate (2008). Another recent study analyzing the empire-building hypothesis is Duchev and Schmidt (2008). An early empirical study investigating managerial objectives, which drive acquisitions, is Morck, Shleifer, and Vishny (1990).

The third contribution of this chapter is to introduce a new explanation for value destroying takeovers by connecting the existing literature on quiet-life managers with the literature on managerial merger theories.

The reminder of the chapter is structured as follows. Section 2 derives the hypotheses. Section 3 introduces the data. Section 4 describes the empirical strategy and presents the results. Section 5 concludes.

2 Hypotheses

There is substantial evidence that managers are interested in keeping their firms independent and thereby securing their jobs and the private benefits associated with them (Morck, Shleifer, and Vishny, 1988b; 1990). Following the ideas of Gorton et al. (2005), managers can prevent a takeover of their firms by acquiring another firm in the industry. The assumption made is that a firm can only acquire firms of smaller size and therefore increasing its own size by acquisitions can prevent becoming a target.[111] The main rationale behind this assumption is that it gets increasingly more difficult for acquirers to raise sufficient financing the larger the acquisition becomes. Of course, this argument depends partly on the costs and availability of takeover financing. In particular, if acquirers can finance acquisitions via stock issues and junk bonds they can be enabled to acquire also targets larger than themselves. This relation-

[111] Louis (2004) provides direct evidence that U.S. banks that were takeover targets and then engaged in acquisitions are less likely to be acquired subsequently than targeted banks that do not make an acquisition.

ship is corroborated by empirical evidence. Trimbath, Frydman, and Frydman (2001) find that during the 1980ies "junk bond era" the negative influence of firm size on takeover probability was considerably smaller than during the 1990ies. However, even if firm size is not a perfect takeover deterrent it should decrease the likelihood of being acquired.

Hypothesis 1: *The probability that a firm is taken over decreases with firm size.*

Based on the assumption that increased firm size can indeed reduce the probability of being taken over Gorton et al. develop a model that combines elements of neoclassical and managerial merger theories and predicts defensive acquisitions. Defensive acquisitions are defined as inefficient acquisitions undertaken by managers to secure the independence of the firm. The neoclassical ingredient of the Gorton et al. model is that there are at least in some states of the world (e.g., after technology shocks or regime shifts) efficient, value increasing, mergers. These value-increasing mergers of course are a threat for potential target companies and their management to lose their independence and possibly their jobs. At this point, Gorton et al. connect their model to managerial merger theories and assume that managers have preferences to keep their firms independent in order to preserve the private benefits associated with their jobs. Gorton et al. then show that under these assumptions, there are two types of acquisitions: (1) efficient acquisitions that are carried out to increase shareholder value, (2) inefficient defensive acquisitions that are only undertaken to preempt efficient acquisitions in order to secure the independence of the firm. The latter type of acquisition allows managers to preserve their private benefits of control and only occurs if there is a threat of an efficient acquisition and managers care sufficiently enough about these private benefits. Based on the simplifying assumptions that all mergers are intra-industry mergers and that private benefits are homogeneous across firms in the same industry, Gorton et al. derive a number of testable predictions about the influence of industry structure on the likelihood of defensive acquisitions. Industry structure in this case means the distribution of firm sizes in an industry.

Gorton et al. consider three different types of industry structure in their analysis. (1) **Homogeneous firm size industry** is an industry where all firms are of similar size such that the merger of any two firms would create a new industry leader. (2) **Heterogeneous firm size industry** is an industry where firms have very different sizes such that no merger of two firms in the industry could create a firm larger than the current industry leader (an industry with a dominant firm). (3) **Mixed firm size industry** is an industry where firms have again different sizes but such that at least some firms in the industry could create a new industry leader by merging.[112] This type of industry is therefore in between the two extreme cases of homogeneous and heterogeneous firm size industries. Based on these definitions of industry structure the model of Gorton et al. predicts that the firm size distribution in an industry determines the likelihood of defensive transactions. Defensive transactions will mainly cluster in industries where most firms are of similar size (homogeneous firm size industries), because in these industries acquisitions offer the possibility to sufficiently increase firm size to deter potential bidders. In homogeneous firm size industries, almost all firms can make acquisitions, which increase firm size sufficiently enough to deter industry peers from a takeover. In other words, most acquisitions in these industries also offer a defensive value to the management. In contrast, in heterogeneous firm size industries, which are characterized by a large dispersion of firm sizes, most firms are not able to implement an acquisition that would deter other industry peers from future takeover attempts. Therefore, the basic difference between heterogeneous and homogeneous firm size industries is that in the latter acquisitions also can have a defensive motive. If there are more inefficient defensive transactions in homogeneous firm size industries, then the average abnormal return at acquisition announcements should be lower for these industries.[113]

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[112] Gorton et al. characterize a mixed firm size industry by the fact that the second and third largest firm in the industry can merge with a smaller firm and create a new industry leader, whereas a merger of the two smallest firms does not create a new industry leader.

[113] Gorton et al. also predict that more merger waves take place in mixed firm size industries, because in these industries unprofitable defensive as well as profitable efficient merger waves can occur. Homogeneous firm

Hypothesis 2: *The market reaction to acquisition announcements is smaller in homogeneous than in heterogeneous firm size industries.*

A second prediction following from the model of Gorton et al. is that we should observe a negative correlation between acquirer returns and acquirer size because large firms are more likely to engage in defensive acquisitions than small firms. The reason is that large firms can always undertake defensive acquisitions to deter future takeover attempts by competitors, whereas small firms are not able to undertake acquisitions with defensive value because there would be always competitors large enough to acquire them even after a defensive takeover. The returns of medium size firms should be somewhere in between because they can only undertake defensive acquisitions if they acquire a relatively large company. Another closely connected factor affecting the motivation of defensive acquisitions is target (or deal) size. Gorton et al. predict also a negative correlation between acquirer returns and target size, because larger acquisitions are more likely to be defensively motivated. This prediction builds on the fact that larger acquisitions increases firm size more than smaller acquisitions and therefore reduce the probability of being acquired more. In other words, a larger acquisition has greater defensive value than a smaller acquisition.

Hypothesis 3: *(1) Abnormal acquirer returns are smaller for large firms than for small firms. (2) Abnormal acquirer returns are smaller for acquisitions of larger targets.*

Another prediction of Gorton et al.'s model is that medium sized firms are most likely to undertake acquisitions, because they tend to make profitable as well as unprofitable (defensive) acquisitions. Small firms usually do not undertake defensive acquisitions because they are too small to grow large enough by acquiring another firm. Whereas large firms undertake predominantly defensive acquisitions if there is a threat of becoming a takeover target.

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size industries are likely to be characterized by defensive merger waves, whereas heterogeneous firm size industries are more likely to exhibit efficient merger waves. I test this hypothesis following the approach of Harford (2005) to identify merger waves. However, I do not find that mixed firm size industries are characterized by more merger waves. I do not include this analysis, because it is beyond the scope of this paper.

Hypothesis 4: *Medium sized firms undertake more acquisitions than large and small sized firms do.*

The model of Gorton et al. focuses on one particular managerial motive, which is survival of the firm as independent entity, to explain value-destroying acquisitions. Their approach abstracts from all other managerial motives or potential biases, which allows them to spell out the consequences of the one managerial motive under study. Of course, survival of the firm as independent entity is a very important managerial objective if managers enjoy private benefits of control and it is also obvious that this objective is crucial in explaining inefficient defensive acquisitions. However, the implicit assumption that all managers are equally prone to defensive acquisitions and it only depends on firm size, industry structure and that private benefits of control are sufficiently high to predict whether a manager is likely to initiate a defensive acquisitions, is somewhat at odds with prior managerial explanations for inefficient mergers. So far most research on managerial merger theories has emphasized the importance of empire-building preferences and overconfidence (or hubris) of managers to explain value destructing acquisitions (see Jensen, 1986, 1993; Morck, Shleifer, and Vishny, 1990; Duchin and Schmidt, 2007; Roll, 1986; Malmendier and Tate, 2008). However, managers prone to empire building or overconfidence are unlikely to arrive in a situation where they have to escape a takeover threat by initiating a defensive acquisition. These kinds of managers should already search the market for possible acquisition targets well before an immediate takeover threat (e.g., caused by a technology shock) occurs and initiate acquisitions as soon as they find a suitable target. In turn, this means that there has to be another type of manager, who initiates defensive acquisitions if these exist at all.

Based on the results of Bertrand and Mullainathan (2003) and Giroud and Mueller (2009), who find that the average manager prefers the quiet life if she has not to threat a takeover or strong product market competition, I introduce a new type of manager, the quiet-life manager,

to the discussion of managerial merger theories. So far, the role of quiet-life managers has been overlooked in the context of mergers and acquisitions. This is quite surprising given that the results of Bertrand and Mullainathan (2003) suggest that managerial behavior is for the most part not consistent with empire building. Of course, the three types of managers (empire-building, overconfident, and quiet-life manager) discussed here, are not necessarily strictly distinct types of managers. It is actually more likely that all managers share these characteristics to some extent, but some may be more prone to empire building, whereas others lean more towards quiet life.

Overconfidence is a behavioral bias, which seems to be more common among empire-building managers as Malmendier and Tate (2008) suggests. As noted already in the Introduction, the identification strategy used for classifying managers in this study does not allow to distinguish between overconfident and empire-building managers, therefore, I will only focus on two types of managers: (1) Empire-building managers, who initiate acquisitions mainly to increase assets under management. (2) Quiet-life managers who get private benefits from managing their firms but at the same time prefer to avoid difficult management decisions. They prefer to pay their workers more, do less internal restructuring (shutting down old plants) and also avoid difficult investment decisions (opening new plants, initiating acquisitions). Of course, also quiet-life managers can only enjoy private benefits from control as long as their firms survive independently. In case of a merger wave in their industry, they are faced with an immediate takeover threat, which leaves them only with the option: “eat or be eaten”. Therefore, I hypothesize that in such a situation, also quiet-life managers become active and may initiate an acquisition. I call these transactions defensive acquisitions because their main purpose is to secure management’s jobs. Given that, the primary motive for these acquisitions is to protect manager's private benefits it is unlikely that considerations to increase shareholder value play the main role in these transactions. Therefore, I predict that defensive transactions undertaken by quiet-life managers lead to negative abnormal announcement returns.

Hypothesis 5: *The market reaction to defensive acquisitions undertaken by quiet-life managers is negative.*

This hypothesis is an extension of the ideas of Gorton et al. and is not in dissent with their model. Therefore, I will start testing their predictions and then turn to the question whether firms run by quiet-life managers initiate (inefficient) defensive takeovers.

3 Data set

The data set consists of all corporate control transactions listed in the Thomson Financial SDC database from January 1, 1973 to December 31, 2006. These are in total 537,990 observations from 211 countries. I drop all transactions where either the acquirer or its parent has an identical SEDOL number to either the target or its parent. I am able to obtain for 180,079 announcements sufficient return data from Datastream (using the companies' SEDOL numbers provided by SDC) to estimate abnormal returns for at least one party taking part in the transaction (acquirer, acquirer parent, target, or target parent). To be included in the sample I require that the transaction is completed, that at least 50% of the shares outstanding were acquired, and that sufficient market data for the acquiring firm exists to estimate abnormal event returns. I drop all transaction where either the acquirer or the target comes from an industry with SIC code between 8000 and 9999. These are mostly companies from the public sector, which operate, for example, in health, educational, and social services. Since the competitive situation in these markets is quite different from other sectors, firms operating in these industries are excluded from the analysis.[114] After matching the remaining 51,274 observations to the prior year accounting data from Worldscope, I also exclude the 42 transactions, which took place before 1981. Finally, I only include observations if the deal value and the market value of the acquirer are known and the deal value relative to the market value of the acquirer

[114] I do not exclude financial firms from the analysis because the dependent variable of most interest is cumulated abnormal returns, which is not affected by differences of accounting variables compared to firms in other sectors. I follow Moeller, Schlingemann, and Stulz (2004), who also not exclude financial firms. As a robustness check (not tabulated) I exclude all firms with primary SIC codes 6000-6799, results remain qualitatively and quantitatively unchanged.

is larger than 1%. These exclusions leave a final data set of 20,978 observations, about 53% of these observations are domestic (non-cross-border) U.S. transactions.

Insert Table 4.1 here

The industry level variables are constructed using the complete Worldscope database, only excluding firms with sales less than one million U.S. $. For the period 1980 to 2005, these are 44,338 firms with 373,681 firm-year observations.[115] In a first step, all firm-year observations of multi-segment firms are split up according to the number of four-digit SIC segments reported by Worldscope. Then for each firm-year, I aggregate all segments with the same three-digit SIC code. Using this procedure I ensure that all firms and subsidiaries operating in the same industry are considered by the analysis. Industries are generally defined at the three-digit SIC level. If there are fewer than three active firms or subsidiaries operating in an industry in a given year I drop these observations. After excluding all firms and subsidiaries with negative assets, sales less than one million U.S. $, SIC codes between 8000 and 9999, the final data set has 437,621 segment-year observations.[116] Since Worldscope contains mostly public companies, the research design with Worldscope as the sole source of accounting information has the drawback that many private companies are not taken into account for estimating the industry level variables. However, I do not see any reason why this should systematically bias the results. Given that I conduct a cross-country study all variables delivered by Worldscope in domestic currency are converted into U.S. $ and deflated. All currency denoted variables are measured in 2000 U.S. $.

Insert Table 4.2 here

All company and deal specific variables used in the analysis are standard, definitions and descriptive statistics can be found in Table 4.2 and Table 4.3. The following deal specific

[115] All variables, which are based on accounting information, use prior year Worldscope data, to avoid any biases caused by the investigated acquisitions themselves.

[116] The data set includes 233,344 single segment firms and 204,277 subsidiaries (single segments) from 124,303 firms with multiple segments.

dummy variables classify transactions into a number of commonly used groups: *AllCash* (*AllEquity*) equals one if only cash (equity) is used to pay for the acquisition. *Competed* equals one if there is more than one bidder competing for the same target. *Conglomerate* equals one if the target has a different two-digit SIC code than the acquirer. *Hostile* equals one if the acquisition is hostile according to SDC. *Private* (*Public*) equals one if the target is a private (public) firm. *TenderOffer* is equal to one if the acquisition is a tender offer. *Large* (*Small*) equals one if the acquirer has a market capitalization equal to or greater (less) than the market capitalization of the 75th (25th) percentile of firms listed in Worldscope in the same year and the same three-digit SIC industry. The size of transactions are measured by *DealSize*, which is defined as the total value of consideration paid by the acquirer, excluding fees and expenses in million 2000 U.S. $. *RelativeSize* is defined as the target's market value of equity divided by the acquirer's market value of equity. *DeltaSizeRank* is used as a proxy for the defensive value of an acquisition. The idea is to measure the number of size ranks a firm advances, because of the acquisition. It is defined as the difference between the rank of the acquirer before the transaction and the estimated rank of the merged firm (measured by market value of equity) in the respective industry's size distribution. It is only calculated if acquirer and target operate in the same three-digit SIC industry.

Two variables measure the merger activity of the acquirer before the respective transaction: *#Deals* is the total number of deals completed by the firm in the two years prior to the acquisition; *AcqVolume* is the total value of mergers (measured by deal value in million 2000 U.S. $) completed by the firm in the two years prior to the acquisition. Another set of variables measures the merger activity in the acquirer's industry. These variables are used as proxies to quantify the takeover threat for a firm: *#DealsIndustry* is the total number of deals completed in the acquirer's major three-digit SIC industry in the two years prior to the acquisition. *AcqVolumeIndustry* is the total value of mergers (measured by deal value in million 2000 U.S. $) completed in the acquirer's major three-digit SIC industry in the two years prior to the ac-

quisition. *LiquidityIndex* measures the merger activity in the target's industry. It is defined, following Schlingemann, Stulz, and Walkling (2002), as the value of all corporate control transactions for one million U.S. $ or more reported by SDC for each year and target's three-digit SIC industry divided by the total book value of assets of all Worldscope firms in the same three-digit SIC industry in that year.

The variables measuring firm characteristics are defined as follows: *Assets* is the book value of total assets at the end of the last calendar year in million 2000 U.S. $. *EquityMarket* is the market value of equity at the end of the last calendar year in million 2000 U.S. $. *Sales* are net sales or revenues over the last calendar in million 2000 U.S. $. *SizePercentileCountry* (*SizePercentileIndustry*) is defined as the firm's percentile of *EquityMarket* of all firms in the same country (three-digit SIC industry), with 100% being the highest and 1% being the lowest percentile. *MarketToBook* is defined as the acquirer's market value of equity divided by the book value of equity at the end of the last calendar year. *FirmAge* is the difference between the current year and the founding year. *MultiSegment* equals one if acquirer is active in more than one three-digit SIC industry and zero otherwise. If a variable name is preceded by "Log", the natural logarithm of the respective variable has been taken.

For analyzing the impact of industry structure on acquirer abnormal announcement returns, a number of industry level variables (all on the three-digit SIC level) are defined, which measure the competitive situation and the market environment for corporate control transactions. *#Firms* is the number of active firms and subsidiaries in an industry. A common measure for product market competition is the Herfindahl-Hirschman-Index (*Herfindahl*), which is defined as the sum of squared market shares in an industry (measured in sales). Another measure for market power is the Lerner Index, which is commonly proxied by the industries median net profit margin (*MedianNetProfitMargin*) in the industrial organization literature. The intuition is that firms in less competitive industries can set their prices above marginal costs

and therefore earn higher margins. On the firm respective subsidiary level the net profit margin (*NetProfitMargin*) is defined as operating income over sales. The main problem with these measures is that they are solely based on public firms listed in the Worldscope database. Hence, *Herfindahl* is biased upward and *#Firms* is biased downward. Such a bias is rather unlikely for *MedianNetProfitMargin*, because indirectly the competition by private firms also affects the profitability of the (public) sample firms. Therefore, I am going to use *MedianNetProfitMargin* in the multivariate analysis as proxy for competitive situation, rather than *Herfindahl* and *#Firms*, but I report if there are any important differences.

HomogeneousIndustry, *HeterogeneousIndustry,* and *MixedIndustry* are dummy variables indicating that firm sizes in an industry are relatively homogeneous, heterogeneous or in between. I adopt the terms used by Gorton et al., who call these three different types of industry: homogenous, heterogeneous and mixed firm size industry. They categorize industries depending on the fact which firms (ranked by size) could create a new industry leader by merging. A homogeneous firm size industry, for example, is defined as an industry where the merger of the two smallest firms would create a new industry leader. However, this definition has the draw back that empirically almost no industry is classified as homogeneous. Therefore, I resort to a different classification scheme based on the empirical industrial organization literature, which has analyzed firm size distributions quiet extensively (see Sutton, 1997). Since the industrial organization literature is more concerned with the evolution of firm size distributions over time, there is only limited guidance how precisely to classify different industries according to their firm size distribution. However, the literature provides insights on which measures are important to describe firm size distributions. Two commonly used moments of firm size distribution are standard deviation and skewness (see Dinlersoz and MacDonald, 2009; Cabral and Mata, 2003). Therefore, I measure firm size heterogeneity by the variance and the skewness of (single segment) firms' and subsidiaries' total assets scaled by the assets of the largest firm or subsidiary in the respective industry. Industries are ranked according to

their variance and skewness of scaled total assets separately and then an equally weighted index of both rankings is calculated. This ranking is done for each sample year. Industries with a large variance and a large skewness of scaled total assets are relatively heterogeneous and will have the highest index values. Therefore, industries in the upper index tercile are classified as *HeterogeneousIndustry* and industries in the lower tercile as *HomogeneousIndustry*. Industries in the middle index tercile are classified as *MixedIndustry*. As noted above this classification is different from the one used by Gorton et al. in their theoretical model, which means that I will not be able to reject their theory based on this analysis. However, the purpose of this chapter is not to exactly test a relatively stylized model of defensive acquisitions but to understand better whether defensive acquisitions exist and how they are characterized.

To distinguish the effects of different managerial motivations for an acquisition I categorize the sample into three groups: (1) Defensive transactions undertaken by quiet-life managers, (2) Acquisitions undertaken by empire-building managers, (3) all other (potentially efficient) acquisitions. The three types are separated based on the historical acquisition activity of the firms and their industry. The *QuietLifeDummy* identifying defensive acquisitions of quiet-life managers equals one if: (1) the acquirer has been relatively inactive in the market for corporate control, *AcqVolume* and *#Deals* are in the lowest tercile of all sample firms over the two years preceding the respective bid; (2) acquisition activity in the bidder's industry was relatively high, *AcqVolumeIndustry* or *#DealsIndustry* is in the highest tercile of all industry-years during the last and the current calendar year; (3) the target operates in the same primary three-digit SIC industry as the bidder. About 5% of all acquisitions in the sample are classified as defensive transactions by quiet-life managers. The *EmpireBuildingDummy* identifies transactions of empire-building managers and equals one if the acquirer has been relatively active in the market for corporate control, *AcqVolume* or *#Deals* are in the highest tercile of all sample firms over the two years preceding the respective bid. In this case, the target's industry and the acquisition activity in the acquirer's industry are not taken into account, be-

cause it is likely that empire-building managers also undertake acquisitions outside their primary industry and during periods of less merger activity. About one third of all acquisitions in the sample are classified as empire-building transactions. I assign the remaining acquisitions to the third group "other acquisitions".

Insert Table 4.3 here

Acquirer and target returns are estimated as abnormal log returns using standard event study methods (see Brown and Warner, 1985). Abnormal returns are calculated over a 3-day event window (-1, 1) using market model benchmark returns.[117] Broad value-weighted country indices provided by Datastream are used as market return. The market model parameters are estimated over a 200-day estimation period (-240, -41). The remaining variables not defined yet, will be explained in more detail when I use them in the analysis.

4 Empirical results

4.1 Probability of being acquired and firm size

The first part of the empirical analysis employs the hazards regression model proposed by Cox (1972) to answer the question whether increased firm size can indeed act as takeover protection. Takeover data can be interpreted as failure time data, when we assume that all firms are at risk to be taken over and the survival time until takeover is observed. I construct such a data set by identifying all firms on the SDC database where the majority of shares outstanding were acquired and matching these observations with the Worldscope database. The year of the takeover is defined as the time of failure. The resulting sample consists of firm-year observations with two types of firms. For one set of firms the year of failure is observed within the sample period until 2006 but for the other set of firms it is not observed because these firms still existed at that point in time. Therefore, a right censoring problem is present, which cannot be treated properly in standard logit or probit models. Those models would con-

[117] As robustness check also the 11-day event window (-5, 5) is used. Results (not tabulated) are consistent for both event windows.

sider firms that are not taken over until the end of the sample period as non-targets.[118] Therefore, estimation outcomes crucially depend on the end point of the study. The Cox model treats these firms as not taken over yet, which means that for these firms the variable takeover year is correctly specified as right-censored at the end year of the study. Therefore, the dependent variable in this case is duration (from entering the sample until takeover) and not just a dummy variable, which distinguishes targets and non-targets. Closely related to the right censoring problem of the takeover year is left truncation, which means that not all firms enter the sample at the same time. The problem of delayed entry is present in this study because accounting databases such as Worldscope add firms at different points in time. This happens either because they expand the universe of firms covered only stepwise or because over time firms newly founded or listed are added to the database. The Cox model also accommodates left truncation. Another advantage of the Cox model is that it allows including time-varying covariates. This is crucial because most firm and industry data change annually and it is likely that the hazard for takeover depends more on recent values of the covariates than on values at the beginning of the sample.[119]

The prior literature on predicting takeover targets has already identified a number of variables affecting the likelihood to become a target. Palepu (1986) finds that smaller firms, less efficient firms, firms with low growth but large financial resources and firms with high growth but low financial resources are likely takeover targets. Hasbrouck (1985) observes a negative influence of size and market-to-book ratio on the takeover probability. Trimbath, Frydman, and Frydman (2001) also find that smaller and more inefficient firms face a greater risk of takeover. Due to these results, I control for a number of firm characteristics when testing Hypothesis 1, which says that the risk of takeover is decreasing in firm size. Besides firm

[118] Shumway (2001) was the first, who proposed to use a hazard model to avoid the deficiencies of standard logit and probit models in the related context of bankruptcies.

[119] See Kalbfleisch and Prentice (2002), chapter 4, or Cameron and Trivedi (2005), chapter 17, for a thorough statistical discussion of the Cox model. A more applied discussion of the Cox model can be found in Hosmer, Lemeshow, and May (2008). Trimbath, Frydman, and Frydman (2001) discuss the econometric issues of the Cox model important to the context of takeovers.

characteristics, I also include a few industry level variables, which proxy for the competitive situation and the merger activity in the firm's major industry. In total, there are 210,224 firm-year observations of 24,563 sample firms (Number of subjects) and 9,004 takeovers (Number of failures).

Insert Table 4.4 here

The results in Table 4.4 clearly show that the risk of a takeover is significantly lower for larger firms. Across six different measures for size, including sales, assets, and market capitalization this finding persists. The effect is not only statistically but also economically significant. The coefficients on *Large* and *Small* in model (1) imply, for example, that firms with a market capitalization in the highest quartile (*Large*=1) of their three-digit SIC industry have an 18% lower probability of being taken over than the firms in the two middle quartiles. In contrast firms in the lowest quartile (*Small* =1) have a 10% higher chance of becoming a target than firms in the two middle quartiles. These results strongly support Hypothesis 1 and I conclude that firm size indeed can act as a takeover defense. However, not only firm size has a negative impact on the risk of takeover, also firm age (*FirmAge*), recent acquisition activity (*Log#Deals*), and higher profitability (*NetProfitMargin*) of the firm reduce the likelihood of being acquired.[120] *Log#Deals* is the natural logarithm of the number of acquisitions (plus one) undertaken by the firm over the last two years. The result supports the notion that own (potentially defensive) acquisitions can prevent a possible takeover in the future. The effect is also economically quite large: a one standard deviation increase in *Log#Deals* decreases the probability of a takeover by about 25%. The negative effect of firm age on the likelihood to become a target is consistent with the widespread belief that old corporations usually do not disappear. Firm age is also a measure of unobserved firm characteristics, which influenced its prior survival and predict its survival in the future. More profitable firms (measured by *NetProfitMargin*) are also less like to be taken over; however, the economic effect is rather small.

[120] Comparable results (not tabulated) are obtained when using *LogAcqVolume* instead of *Log#Deals*.

In line with the results of Palepu (1986), I find that firms with financial resource constraints or high growth potential are more likely to be taken over. Leverage (*Leverage*) defined as total debt over total debt plus common equity and liquidity (*PercentCash*) defined as cash plus short-term investments over total assets are used as proxies for financial resource availability. Growth potential is proxied by research and development expenses over total asset (*R&D*).[121] Firms with higher leverage are significantly more likely to be taken over, whereas the coefficient for *PercentCash* has the expected negative sign but is insignificant. Firms with high R&D expenditures are significantly more likely to become a target. Both results together imply that in particular firms with high growth potential but small financial recourses have a higher probability to be acquired. These are possibly smaller and younger firms, which are acquired by older and larger firms to augment their product portfolio. The coefficients of market-to-book ratio and capital expenditures (*CapEx*) are insignificant.

Besides firm specific factors, industry characteristics also have an influence on the risk of takeover. I focus here on industry rather than country characteristics, because as neoclassical merger theories and also the model of Gorton et al. predict, merger waves mostly cluster by industry (see, for example, Mitchell and Mulherin, 1996). In times of high takeover activity in an industry (*Log#DealsIndustry*), the probability of becoming a target increases as well.[122] Moreover, it seems that firms from homogeneous and heterogeneous firm size industries have a lower risk to become a target, however, only the coefficient of *HomogeneousIndustry* is significant. This result is in line with the prediction of Gorton et al. that most merger waves should be expected in mixed firm size industries, because in these industries inefficient (defensive) as well as efficient merger waves should occur. The competitive situation in an industry also affects the likelihood of takeover. Firms in less competitive industries (with higher

[121] Since research and development expenses often need not to be reported, I set this item equal to zero if it is missing.

[122] Comparable results (not tabulated) are obtained when using *LogAcqVolumeIndustry* instead of *Log#DealsIndustry*.

net profit margins) have a higher likelihood to become a target. However, the coefficient of *MediumNetProfitMargin* is in most of the models only marginally significant.

4.2 Profitability of acquisitions

The second part of the empirical analysis relates industry characteristics to the profitability of acquisitions. Therefore, the dependent variable in Table 4.5 is the three-day cumulated abnormal acquirer announcement return (*AcquirerCAR*). There is a large body of literature, which analyzes acquirer announcement returns and links them to a number of deal, firm and industry characteristics (see, for example, Moeller, Schlingemann, and Stulz, 2004). I include all standard control variables and the industry structure variables needed to test the prediction of Hypothesis 2 that acquirer announcement returns are lower for homogeneous industries than for heterogeneous industries, because the latter should exhibit fewer defensive transactions. Additionally I also test Hypothesis 3, which states that (1) acquirer returns of large firms are smaller because they are more likely to undertake defensive acquisitions and (2) acquirer returns are smaller for large targets because they offer a higher defensive value for the acquirer. By splitting the sample into four size quartiles, I can analyze the profitability of acquisitions undertaken by small, medium and large firms separately (models (4) to (7)). The size quartiles are assigned to firms according to their size quartile in the prior year in the complete Worldscope database. For example, in the first size quartile are all acquirers, which have a market capitalization less than the 25th percentile of all firms listed in the Worldscope database at the end of the last year. The number of observations in each size quartile shows that small firms undertake considerably fewer acquisitions than medium sized or large firms.

Insert Table 4.5 here

The results in Table 4.5 only partly support Hypothesis 2. If I only control for year and country fixed effects, the coefficient for *HomogeneousIndustry* is negative and significant at the 5% level. When controlling for other industry, deal and firm characteristics the coefficient for

HomogeneousIndustry remains effectively unchanged but it is only statistically significant at the 10% level. The economic significance is rather small. On average acquirer returns are lower by 0.22% in homogenous than in mixed firm size industries. The difference between the coefficients for *HomogeneousIndustry* and *HeterogeneousIndustry* is only significantly different from zero for model (1), where I do not control for other industry, deal and firm characteristics. Therefore, I only find limited support for Hypothesis 2. This result suggests that defensive acquisitions do possibly cluster in homogeneous firm size industries, as predicted by Gorton et al, but that other effects, for example, empire building or hubris, which probably do not cluster by industry, overlay the influence of industry structure.

I include three additional industry level variables to measure the acquisition activity in the acquirer's and the target's industry and the competitive situation in the acquirer's industry. In times of high acquisition activity, measured by the number of transactions in the acquirer's three-digit SIC industry over the prior two years (*#DealsIndustry*)[123] the acquirer announcement returns decrease. These results are in line with Duchin and Schmidt (2007), who find that within merger waves acquirer announcement as well as buy and hold returns are lower than outside merger waves. However, their interpretation of this finding is different. They argue that empire-building managers try to hide their intentions by undertaking inefficient acquisitions inside merger waves, whereas I propose that these lower acquirer announcement returns are mainly caused by defensive transactions. This kind of (inefficient) acquisitions should be carried out mostly inside merger waves, because during these times firms are exposed to a particularly strong takeover threat. In such situations, quiet-life managers are likely to consider acquisitions in order to secure the independence of their firms and the associated private benefits. In Section 4.4, I will test this hypothesis by categorizing firms according to their prior acquisition activity and discuss why I find other explanations less convincing.

[123] Results are robust if one uses aggregated transaction volume (*AcqVolumeIndustry*) instead of number of transactions.

As measure for the acquisition activity in the target's industry, I use the liquidity index proposed by Schlingemann, Stulz, and Walkling (2002). The index measures the turnover of assets in the target's industry and high values imply stronger competition for these assets. Therefore, I expect a negative effect of *LiquidityIndex* on acquirer announcement returns. However, the coefficient is mostly positive and always statistically insignificant. It seems that *LiquidityIndex* has no explanatory power above what is already explained by *#DealsIndustry*, even though the correlation between both measures is rather moderate (Pearson correlation coefficient: 0.4).

Besides the acquisition activity, I also measure the influence of competition in the acquirer's industry. As a proxy for competitive situation the median net profit margin in the acquirer's three-digit SIC industry (*MedianNetProfitMargin*)[124] is used. Giroud and Mueller (2009) show that competition in the product market mitigates managerial agency problems. Therefore, I expect lower acquirer announcement returns in less competitive industries. Consistent with this hypothesis a negative coefficient for *MedianNetProfitMargin* is estimated. Indeed, it seems that managers in non-competitive industries undertake more shareholder value destroying acquisitions. However, the effect is economically small and not statistically significant in all size quartiles. The coefficients for the complete sample, models (2) and (3), imply that an increase of *MedianNetProfitMargin* by one standard deviation decreases acquirer announcement returns by about 13 basis points. Results are comparable if I use the *Herfindahl* index or the number of firms in the industry (*#Firms*) as proxies for the competitive situation (not reported), however, significance levels are generally lower.[125] It seems that product market competition has a positive but relatively small influence on acquirer announcement returns.

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[124] The industrial organization literature uses the industry net profit margin commonly as an empirical proxy for the Lerner Index. The intuition is that monopolists and oligopolists can set prices in excess of marginal costs, which yields higher margins.

[125] The *Herfindahl* index is likely to be biased in my sample because it is based solely on data from Worldscope, which contains mostly public firms. Therefore, the *Herfindahl* index is overestimated for industries with a large number of private firms, since the market share of these firms is ignored. The median net profit

As predicted by Hypothesis 3 I find that large firms tend to undertake fewer profitable acquisitions than small firms. Announcement returns for large acquirer are about 0.5 percentage points smaller than for medium sized acquirer and about 1.5 percentage points smaller than for small acquirer (see model (2)). Coherent with this result the coefficient for *LogEquityMarket* implies that an increase of *LogEquityMarket* by one standard deviation decreases acquirer announcement returns by about 0.5 percentage points.

The second prediction of Hypothesis 3 that the relative size of the target and acquirer has a negative effect on abnormal returns does not seem to hold given the significantly positive coefficients for *RelativeSize* in model (2) and (3). However, when splitting the sample into size quartiles (models (4) to (7)) I find a significantly positive effect of *RelativeSize* for small and medium sized acquirers but a significantly negative effect for large acquirers. Together with the first result that large firms undertake acquisitions, which are less profitable, I interpret this finding as evidence that only firms of a certain size are able to undertake defensive transactions and that the defensive value of the acquisition increases with target size. In other words, managers of larger firms seem to be willing to pay inefficiently high premia and this willingness increases with the size of the target, because the acquisition of a larger target offers better protection from future takeover attempts. Since large firms are more likely to pay excessive premia, especially for relatively large targets, we observe lower average announcement returns for this group of firms. Already Moeller, Schlingemann, and Stulz (2004) find a significantly negative effect of firm size on acquirer announcement returns and that the effect of relative size of target and acquirer depends on the size of the acquirer (for small firms positive, for large firms negative).[126] Moeller et al. do not find a clear explanation for the negative size effect but suggest that maybe managers of large firms are more frequently prone to hu-

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margin should be less affected from this problem, since the median profitability of firms in the sample is influenced by all firms in the industry independent of their inclusion in the Worldscope database.

126 The latter observation could explain why prior studies have found different results for the relative size coefficient. For instance, Asquith, Bruner, and Mullins (1983) find a positive relationship but in Travlos (1987) it is (insignificantly) negative.

bris. Another possible explanation could be that empire-building managers in large firms with substantial free cash flows and few investment opportunities prefer to undertake acquisitions instead of paying out the excess cash flow to shareholders. If this hypothesis would be true, one should expect large firms to hold more excess cash. However, Moeller et al. do not find evidence that larger firms hold more excess cash than smaller firms.

The other results from these regressions are mostly in line with the prior literature (see, for example, Fuller, Netter, and Schlingemann, 2002; Moeller, Schlingemann, and Stulz, 2004). I find that acquisitions of public targets yield significantly lower abnormal acquirer returns whereas tender offers lead to significantly higher acquirer returns. These results hold for most specifications. Pure equity as well as pure cash acquisitions have lower abnormal returns; however, the respective coefficients are in most specifications insignificant. The other deal and firm specific control variables are almost always insignificant.

4.3 Acquisition activity and firm size

Based on the model of Gorton et al. Hypothesis 4 predicts that medium sized firms undertake more acquisitions than large and small firms, because medium sized firms undertake inefficient (defensive) as well as efficient acquisitions. Table 4.6 shows how the average number of acquisitions and the average total acquisition volume per year and firm differs between firm size deciles. Firms are assigned to firm size deciles according to their market value of equity decile at the end of the last year in the complete Worldscope database. For example, firms in the largest firm size decile 10 have a market value of equity above the 90^{th} percentile of all firms listed in Worldscope at the end of the last year. An analysis of firm size and acquisition activity could become severely biased if the likelihood of a deal to be included in the SDC database is increased by the size of the acquirer or target. Such a selection bias of the SDC database would induce a positive correlation between firm size and the measures of acquisition activity. Since the SDC database is highly incomplete and skewed towards larger acquir-

ers and targets for the years preceding 1990, I exclude observations before 1990 from the sample. Undoubtedly, the quality of SDC's coverage has strongly improved over time and it is unlikely that after the late 1990ies still a severe bias towards large acquirers and targets exists. Particularly, this bias should not be present for U.S. domestic transactions. As a robustness check, I repeat the analysis for a subsample that includes only the years 1998 to 2006, and for the subsample of U.S. domestic acquisitions (both not tabulated) but results remain unchanged.

Insert Table 4.6 here

The results in Table 4.6 show a positive and monotonic relationship between the acquirer's market value of equity and both measures of acquisition activity. The differences in average number of acquisitions and average acquisitions volume (per year and firm) between firm size deciles are always positive and highly significant. This finding suggests that with increased firm size on average also the acquisition activity increases, which is in contrast to Hypothesis 4. There is no support for the prediction of Gorton et al. that medium sized firms undertake more acquisitions than large firms. A possible explanation for this contradiction is that the model of Gorton et al. does not take into account any other managerial merger motives than survival of the firm. If, for example, large firms are more likely managed by empire-building managers, ceteris paribus large firms should undertake more acquisitions than small or medium sized firms. Other explanations why large firms undertake more acquisitions are that (1) managers of large firms could be more frequently prone to hubris, (2) large firms have more resources and therefore face fewer obstacles in making acquisitions, and (3) large firms are more likely to be further along their life cycle and therefore have less internal growth opportunities and therefore rely more on external growth.

4.4 Defensive acquisitions and abnormal announcement returns

As the preceding analysis shows, there is only limited support for the empirical predictions made by the model of Gorton et al. A possible reason for this partial failure is that their model focuses solely on the role of industry structure and firm size leading to testable hypotheses, which can identify the impact of defensive acquisitions only imprecisely. Like Gorton et al. I also build on the assumptions that increased firm size reduces the probability of being acquired by another firm and that managers value private benefits of control. However, I propose an alternative identification strategy to test the hypothesis that managers are willing to undertake unprofitable defensive acquisitions to secure private benefits of control. As I established in the hypothesis discussion above there seem to exist managers, who are prone to empire building and other managers, who prefer the quite life. The fact that empire-building and quiet-life managers should exhibit very different behavior with respect to acquisitions opens the possibility to test the hypothesis that defensive, shareholder value destroying, acquisitions indeed exist. The four crucial assumptions to distinguish firms run by either type of managers are that (1) quiet-life managers only become active in the market for corporate control if there is an immediate takeover threat, but mostly abstain from acquisitions otherwise. (2) While empire-building managers undertake acquisitions frequently and independent of an immediate takeover threat. (3) Empire-building managers undertake conglomerate as well as non-conglomerate acquisitions, (4) whereas quiet-life managers focus on acquisitions within their industry. Assumptions (1) and (4) are consistent with the behavior described by Bertrand and Mullainathan (2003) and assumption (3) follows naturally from the definition of empire-builders as managers who like assets under management and tend to expand the boundaries of the firm far beyond its optimal scope.

Assumption (2) differs from the ideas formulated by Duchin and Schmidt (2007), who suggest that empire-building managers try to hide their real intentions by undertaking acquisitions mostly during merger waves. The assumption made is that managers weigh the costs and

benefits of empire building, and only initiate acquisitions when the benefits outweigh the costs. According to Duchin and Schmidt career concerns (i.e., forced turnover after shareholder value destroying acquisitions) let managers refrain from maximizing assets under management.[127] Duchin and Schmidt suggest that the costs of empire building are lower during merger waves and therefore the number of empire building (inefficient) acquisitions is higher. The argument that empire-building managers are at least partially aware of fact that they destroy value by pursuing their acquisition strategy and try to wait for the right moment to camouflage their actions is not implausible. However, it is not clear why this behavior should cause a higher proportion of transactions inside merger waves to be driven by empire building considerations than outside waves. By definition more acquisitions take place inside merger waves, therefore, an increased number of empire building transactions does not necessarily imply that there is a higher proportion of them. There are also good arguments for empire-building managers to undertake acquisitions outside merger waves because there should be less competition for targets and therefore lower prices. In particular, if managers are aware of their potentially value destroying behavior, they should also be aware of the fact that targets are usually cheaper outside merger waves. Nonetheless, I see a clear reason for an increased proportion of defensive transaction initiated by quiet-life managers inside merger waves, because they face an immediate takeover threat harming their private benefits of control.

Duchin and Schmidt try to support their idea that empire-building transactions are predominantly carried out during merger waves by the fact that corporate governance measures of acquiring firms are worse during than outside merger waves. This interpretation implies that firms with weaker corporate governance either are more frequently managed by empire builders or give mangers with empire-building preferences more possibilities to pursue their agenda. However, given the results of Bertrand and Mullainathan (2003) and Giroud and

[127] They also note that compensation schemes designed to better align the incentives of managers and shareholders could curb managerial empire building behavior.

Mueller (2009) it is not clear that managers, who are not under direct scrutiny of shareholders, use their additional leeway for building empires. Instead, it seems that on average managers actually prefer to enjoy the quite life if shareholders and completion allow them. Therefore, the results of Duchin and Schmidt are in line with my hypothesis that during merger waves firms run by quite-life managers initiate inefficient defensive acquisitions.

I start my analysis by a univariate comparison between the three different groups of takeover classified above: (1) acquisitions by firms run by quite-life managers, (2) acquisitions by firms managed by empire builders, and (3) other (potentially efficient) acquisitions.

Insert Table 4.7 here

Table 4.7 shows that defensive acquisitions by quiet-life managers and empire-building transactions have significantly lower abnormal acquirer returns than other acquisitions. However, the average abnormal acquirer return of empire-building transactions is only negative for the longer event window (-5, 5). The target announcement returns are positive and between 12% and 13% but do not significantly differ across the three groups, which implies that the lower acquirer returns do not simply stem from larger takeover premiums. Empire-building firms are about two times larger than other acquirers, and firms undertaking defensive acquisition are about 50% larger than other acquirers and about 10% larger than the average firm in the sample (measured by *EquityMarket* and *Assets*), which implies that both types of firms are rather large. However, the proportion of acquirers managed by quiet-life managers in the largest and smallest firm size quartile (*Large* and *Small*) does not differ significantly from other acquirers. Firms categorized as defensive acquirers undertake larger transactions in absolute (*DealSize*) as well as relative terms (*RelativeSize*), operate in industries with more rival firms and smaller Herfindahl index (potentially higher consolidation pressure), and the number of ranks the acquirer advances in its industry's size ranking (*DeltaSizeRanks*) is two to three times larger than for the two other acquirer groups. All these facts suggest that the categorized

transactions are indeed of defensive nature. The three groups of acquisition types also differ substantially in their deal characteristics. Firms run by quiet-life managers acquire significantly more public and therefore are also more likely to make a tender offer and to pay only with stocks (*AllEquity*), which underscores the importance to control for these effects in the following multivariate analysis.

Insert Table 4.8 here

The multivariate results in Table 4.8 confirm that defensive transactions by quiet-life managers have significantly lower announcement returns before controlling for other effects. The abnormal return is 1.1 percentage points lower for transactions classified as defensive. Empire-building acquisitions also lead to lower abnormal acquirer returns. The negative effect is with 0.3 percentage points much smaller but still statistically significant. After controlling for industry, deal and firm characteristics as well as year and country fixed effects the magnitude of the coefficient on the *QuietLifeDummy* is substantially reduced to about -0.6%, but remains significant. The coefficient on the *EmpireBuildingDummy* becomes positive in two out of three models but is always economically and statistically insignificant. Therefore, the results are consistent with Hypothesis 5: defensive acquisitions undertaken by quiet-life managers indeed exist and are characterized by lower announcement returns. The economic effect is also quite substantial, abnormal returns are lower by 0.58 to 1.2 percentage points for this kind of acquisition.[128] The magnitude of value destruction is comparable to the results of Malmendier and Tate (2008), who find in their regression analysis that acquirer returns of firms run by overconfident CEOs are 0.78 to 1.15 percentage points lower than for an average firm.

At first sight the positive (but insignificant) coefficient of the *EmpireBuildingDummy* seems somewhat striking, however, there are three control variables, which also proxy for empire-building tendencies of the management. Both the size proxy (*LogEquityMarket*) and the prox-

[128] The effect is somewhat larger in the domestic U.S. sample (not tabulated).

ies for the firm's historical acquisition activity (*Log#Deals* and *LogAcqVolume*) are linked to empire building and absorb the effect of the *EmpireBuildingDummy*. It is of course not surprising that the *EmpireBuildingDummy* is closely related to *#Deals* and A*cqVolume*, given that its definition is based on both variables. Model (6) shows that after exclusion of *LogEquityMarket*, *Log#Deals*, and *LogAcqVolume* the coefficient of *EmpireBuildingDummy* is significantly negative and of similar magnitude as in the models (1) and (2).

The significantly negative coefficients of *LogEquityMarket* confirm the negative size effect already found in Table 4.5. The measures for prior acquisition activity (*Log#Deals* and *LogAcqVolume*) do not have a significant influence on the acquirer announcement returns. Taking also into account the results for the *EmpireBuildingDummy* it does not seem that frequent acquirers undertake acquisitions, which are significantly more or less profitable than an average acquisition after controlling for firm size. Therefore, I cannot conclude that the main motive of frequent acquirers is inefficient empire building. However, there is also no evidence, that firms that undertake many acquisitions are particularly good at identifying profitable acquisition opportunities. One possible explanation is that both effects are roughly equal and therefore cancel each other out. However, it is also not unlikely that the market already anticipates future transactions of firms that made many acquisitions in the past and therefore the abnormal returns at the announcement are attenuated.

The coefficients for industry level variables are comparable to the results in Table 4.5. Acquirers from homogenous firm size industries have lower announcement returns than acquirers from mixed firm size industries, but the statistical and economic significance in rather marginal. Their returns are not significantly different from firms active in heterogeneous firm size industries. Acquirer returns are also lower when acquisition activity in the acquirer's industry is rather high, if *Log#DealsIndustry* or *LogAcqVolumeIndustry* increase by one standard deviation the acquirer returns are reduced by approximately 0.4 percentage points. Re-

duced product market competition (measured by *MedianNetProfitMargin*) has again a significantly negative but quite small influence on acquirer returns. The results for the other control variables are in line with the ones obtained from Table 4.5 and are already discussed above.

5 Conclusions

This chapter analyses the influence of industry and firm characteristics on the profitability and likelihood of mergers and acquisitions. I find that firm size is, as hypothesized by Gorton et al. (2005), an important takeover defense. Therefore, it is plausible that self-interested managers make use of this defense by undertaking value destroying defensive acquisitions. However, in contrast to the predictions of Gorton et al.'s model I cannot find empirically a strong impact of the firm size distribution in an industry on the profitability of acquisitions. In addition, the predictions about merger activity across firms do not seem to hold. These results lead to the conclusion that defensive transactions most likely do not cluster by industry structure (distribution of firm sizes in an industries). Nonetheless, this result does not mean that defensive transactions are generally not undertaken. I suggest a different identification strategy of defensive acquisitions based on firm and industry characteristics. I propose that the group of managers most prone to defensive acquisitions is quiet-life managers, who are not interested in maximizing assets under their management, but care sufficiently enough about the private benefits from managing an independent firm. The self-interest to keep their private benefits and the possibility to avoid becoming a target by increasing firm size leads those managers to undertake defensive transactions. I find strong evidence that firms that were not active in the market for corporate control before undertake acquisitions if the recent merger activity in their industry is high. I also show that these acquisitions destroy value. Based on these results I conclude that besides the well-known empire-building and overconfident managers a third type of managers exists, who is initiating shareholder value destroying acquisitions: quiet-life managers.

6 Tables

Table 4.1: Sample design

This table displays how our sample is constructed from raw Thomson Financial SDC Platinum (SDC) data to the final sample. I include all corporate control transactions listed in the SDC database from January 1, 1973 to December 31, 2006 in the initial data set. I report the losses of observations because of consistency checks, missing information, and sample selection criteria.

	Transactions lost	Transactions left after this step
All corporate control transactions listed in the Thomson Financial SDC database from January 1, 1973 to December 31, 2006		567,080
- transactions where either the acquirer or its parent has an identical SEDOL number to either the target or its parent, or all SEDOL numbers are missing	-387,001	180,079
- transactions not completed or less than 50% of shares outstanding acquired	-75,267	104,812
- insufficient data for event window or estimation period for acquirer company	-48,647	56,165
- acquirer or target active in an industry with SIC code between 8000 and 9999	-4,891	51,274
- no match with Worldscope possible	-389	50,885
- transactions before January 1, 1981	-42	50,843
- deal value relative to the market value of the acquirer is smaller than 1%	-29,865	20,978
All observations in the sample		20,978

Table 4.2: Definitions of variables used in this chapter

This table defines all variables used in this chapter. Data on mergers and acquisitions are taken from Thomson Financial's SDC Platinum (SDC), accounting data from Worldscope (WS), market data from Datastream (DS). The numbers in brackets refer to Worldscope items, taken from the Worldscope Data Definition Guide.

Variable	Description	Source
#Deals	Accumulated number of deals completed by the firm in the two years prior to the acquisition	SDC
#DealsIndustry	Accumulated number of deals completed in the acquirer's major three-digit SIC industry in the two years prior to the acquisition	SDC
#Firms	number of active firms and subsidiaries in the acquirer's major three-digit SIC industry	WS
AcqVolume	Accumulated value of mergers (measured by deal value) completed by the firm in the two years prior to the acquisition (in million 2000 U.S. $)	SDC
AcqVolume Industry	Accumulated value of mergers (measured by deal value) completed in the acquirer's major three-digit SIC industry in the two years prior to the acquisition (in million 2000 U.S. $)	SDC
AllCash	= 1 if only cash is used to pay for the acquisition	SDC
AllEquity	= 1 if only equity is used to pay for the acquisition	SDC
Assets	Total assets [07230] at the end of the last calendar year (in million 2000 U.S.$)	WS
CapEx	= capital expenditures [04601] / total assets [02999]	
Competed	= 1 there is more than one bidder	SDC
Conglomerate	= 1 if the target has a different two-digit SIC code than the acquirer	SDC
DealSize	Is the total value of consideration paid by the acquirer, excluding fees and expenses (in million 2000 U.S. $)	SDC
DeltaSizeRank	Difference between the rank of the acquirer before the transaction and the estimated rank of the merged firm (measured by EquityMarket), only calculated if in the same three-digit SIC industry	SDC, WS
EmpireBuilding Dummy	= 1 if #Deals & AcqVolume are in the upper tercile of the acquirer's three-digit SIC industry in the preceding and the current year	SDC
EquityMarket	Market value of equity [07210] at the end of the last calendar year (in million 2000 U.S. $)	WS
FirmAge	= year – founding year [18272]	WS
Herfindahl	Herfindahl index (sum of squared market shares measured in sales) in the acquirer's major three-digit SIC industry	WS
Heterogeneous Industry	= 1 if the equally weighted index of skewness and variance of total assets across all (single segment) firms and subsidiaries in the acquirer's major three-digit SIC industry is in the upper tercile of all three-digit SIC industries	WS
Homogeneous Industry	= 1 if the equally weighted index of skewness and variance of total assets across all (single segment) firms and subsidiaries in the acquirer's major three-digit SIC industry is in the lower tercile of all three-digit SIC industries	WS
Hostile	= 1 if the acquisition is hostile	SDC
Large	= 1 if the acquirer has a market capitalization equal to or greater than the market capitalization of the 75th percentile of firms listed in WS in the same year and three-digit SIC industry	WS
Leverage	= total debt [03255] / (total debt + common equity [03501])	WS
LiquidityIndex	Value of all corporate control transactions for one million U.S. $ or more reported by SDC for each year and target's three-digit SIC industry divided by the total book value of assets of all WS firms in the same three-digit SIC industry in that year	SDC, WS

Variable	Description	Source
MarketToBook	Acquirer's market value of equity [07210] divided by the book value of equity [07220] at the end of the last calendar year	WS
MedianNetProfit Margin	Median net profit margin defined as operating income over sales across all (single segment) firms and subsidiaries in the acquirer's major three-digit SIC industry	WS
MixedIndustry	= 1 if the equally weighted index of skewness and variance of total assets across all (single segment) firms and subsidiaries in the acquirer's major three-digit SIC industry is in the middle tercile of all three-digit SIC industries	WS
MultiSegment	= 1 if acquirer is active in more than one three-digit SIC industry	WS
NetProfitMargin	= operating income [01250] / net sales or revenues [01001]	
PercentCash	= cash & short term investments [02001] / total assets [02999]	
Private	= 1 if the target is a private firm	SDC
Public	= 1 if the target is a public firm	SDC
QuietLifeDummy	= 1 if #Deals & AcqVolume are in the lower tercile of the acquirer's three-digit SIC industry in the preceding year and #DealsIndustry & AcqVolumeIndustry are in the upper tercile of the acquirer's three-digit SIC industry's history in the current year and acquirer & target operate in the same	SDC
R&D	= R&D expenses [01201] / total assets [02999]	WS
RelativeSize	= target's EquityMarket / acquirer's EquityMarket	WS
Sales	Net sales or revenues [07240] at the end of the last calendar (in million 2000 U.S. $)	WS
SizePercentile Country	= percentile(EquityMarket) of all firms in the same country, with 100% being the highest and 1% being the lowest percentile	WS
SizePercentile Industry	= percentile(EquityMarket) of all firms in the same three-digit SIC industry, with 100% being the highest and 1% being the lowest percentile	WS
Small	= 1 if acquirer have a market capitalization equal to or less than the market capitalization of the 25th percentile of firms listed in WS in the same year and three-digit SIC industry	WS
TenderOffer	= 1 if the acquisition is a tender offer	SDC

Table 4.3: Summary statistics

This table displays descriptive statistics for 40 variables used in the analysis. See Table 4.2 for a definition of all variables. Data on mergers and acquisitions is obtained form Thomson Financial's SDC Platinum. Accounting data are taken from Worldscope and market data from Datastream.

Variable	N	Mean	Median	Standard deviation
#Deals	20978	3.7	2.0	4.4
#DealsIndustry	20978	193.9	60.0	324.6
#Firms	19853	422.2	222.0	537.9
Acquirer CAR(-1, 1)	20978	0.005	0.003	0.068
Acquirer CAR(-5, 5)	20978	0.002	0.001	0.106
AcqVolume	20978	521.3	95.2	2,153.8
AcqVolumeIndustry	20978	34,338.9	8,052.2	64,747.5
AllCash	20978	0.557	1.000	0.497
AllEquity	20978	0.171	0.000	0.377
Assets	20978	9,159.6	814.3	48,385.1
Competed	20978	0.138	0.000	0.345
Conglomerate	20978	0.431	0.000	0.495
DealSize	20978	434.0	60.0	2,553.2
DeltaSizeRank	5141	16.9	4.0	42.3
EmpireBuildingDummy	20978	0.330	0.000	0.470
EquityMarket	20978	3,311.3	734.0	10,974.8
Herfindahl	19853	0.071	0.041	0.091
HeterogeneousIndustry	19853	0.107	0.000	0.309
HomogeneousIndustry	19853	0.379	0.000	0.485
Hostile	20978	0.004	0.000	0.066
Large	20978	0.524	1.000	0.499
LiquidityIndex	19252	0.045	0.018	0.081
MarketToBook	20654	3.898	2.208	18.502
MedianNetProfitMargin	19853	0.104	0.072	0.094
MixedIndustry	19853	0.514	1.000	0.500
Private	20978	0.416	0.000	0.493
Public	20978	0.216	0.000	0.411
QuietLifeDummy	20978	0.049	0.000	0.216
RelativeSize	20978	0.239	0.083	0.700
Small	20978	0.038	0.000	0.190
Target CAR(-1, 1)	1773	0.126	0.109	0.183
Target CAR(-5, 5)	1773	0.129	0.116	0.211
TenderOffer	20978	0.069	0.000	0.253

Table 4.4: Firm and industry characteristics and the risk of takeover

The table presents the results for Cox hazards regressions with duration until takeover in years as dependent variable. See Table 4.2 for a definition of all variables. For each independent variable, the table displays the relative hazards defined as $hr_i = \exp(\beta_i) - 1$, where β_i is the estimated coefficient and, in italics, the p-value of the two-sided t-test. The p-values are based on robust standard errors with firm-clusters.

		(1)	(2)	(3)	(4)	(5)	(6)
Firm characteristics	Large	-0.1829					
		0.000					
	Small	0.0962					
		0.000					
	LogAssets		-0.0622				
			0.000				
	LogSales			-0.0330			
				0.000			
	LogEquityMarket				-0.0577		
					0.000		
	SizePercentileIndustry					-0.3107	
						0.000	
	SizePercentileCountry						-0.2634
							0.000
	CapEx	0.0221	-0.0042	-0.0031	0.0318	0.0283	0.0244
		0.659	*0.905*	*0.968*	*0.482*	*0.540*	*0.622*
	FirmAge	-0.0097	-0.0108	-0.0099	-0.0097	-0.0097	-0.0097
		0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	Leverage	0.5474	0.5659	0.5492	0.5397	0.5370	0.5398
		0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	Log#Deals	-0.3748	-0.4036	-0.4007	-0.3658	-0.3728	-0.3814
		0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	MarketToBook	-0.0013	-0.0037	-0.0026	-0.0012	-0.0013	-0.0013
		0.315	*0.329*	*0.306*	*0.319*	*0.315*	*0.321*
	NetProfitMargin	-0.0258	-0.0268	-0.0270	-0.0254	-0.0256	-0.0259
		0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	PercentCash	-0.0370	-0.0755	-0.0707	-0.0312	-0.0298	-0.0432
		0.630	*0.380*	*0.311*	*0.685*	*0.699*	*0.572*
	R&D	0.6965	0.7320	0.7048	0.6782	0.6843	0.7091
		0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
Industry characteristics	HomogeneousIndustry	-0.0807	-0.0803	-0.0805	-0.0796	-0.0807	-0.0798
		0.003	*0.003*	*0.005*	*0.004*	*0.003*	*0.004*
	HeterogeneousIndustry	-0.0580	-0.0542	-0.0553	-0.0578	-0.0581	-0.0579
		0.199	*0.203*	*0.201*	*0.201*	*0.199*	*0.201*
	Log#DealsIndustry	0.0910	0.0903	0.0904	0.0968	0.0906	0.0954
		0.000	*0.000*	*0.000*	*0.000*	*0.000*	*0.000*
	MedianNetProfitMargin	0.8662	0.9182	0.9681	1.1138	0.8611	1.0316
		0.076	*0.059*	*0.061*	*0.033*	*0.077*	*0.043*
	Observations	210,224	210,224	210,224	210,224	210,224	210,224
	Number of subjects	24,563	24,563	24,563	24,563	24,563	24,563
	Number of failures	9,004	9,004	9,004	9,004	9,004	9,004
	Pseudo R^2	0.036	0.036	0.036	0.036	0.036	0.036
	Fixed effects	Year, Country, Industry	Year, Country, Industry	Year, Country, Industry	Year, Country, Industry	Year, Country, Industry	Year, Country, Industry

Table 4.5: Determinants of abnormal acquirer announcement returns

The table presents results for OLS regressions with acquirer CAR(-1, 1) as dependent variable. See Table 4.2 for a definition of all variables. For each independent variable, the table displays the slope estimate and, in italics, the p-value of the two-sided t-test for zero slope. The p-values are based on robust standard errors with firm-clusters. Intercept is not displayed. Additionally, the significance level of the F-test for the equality of the coefficients on HomogeneousIndustry and HeterogeneousIndustry is displayed (*** 1%, ** 5%, * 10% significance level, - insignificant).

		All	All	All	Size Quartiles			
					1	2	3	4
		(1)	(2)	(3)	(4)	(5)	(6)	(7)
Industry characteristics	HomogeneousIndustry	-0.0022	-0.0022	-0.0021	-0.0128	-0.0005	-0.0012	-0.0022
		0.037	*0.053*	*0.064*	*0.228*	*0.893*	*0.555*	*0.095*
	HeterogeneousIndustry	0.0028	-0.0025	-0.0025	-0.0332	-0.0073	-0.0017	-0.0001
		0.091	*0.170*	*0.171*	*0.029*	*0.248*	*0.619*	*0.978*
	LiquidityIndex		0.0034	0.0030	-0.0457	-0.0075	0.0128	0.0078
			0.610	*0.659*	*0.419*	*0.720*	*0.304*	*0.342*
	Log#DealsIndustry		-0.0025	-0.0025	-0.0041	-0.0047	-0.0030	-0.0014
			0.000	*0.000*	*0.206*	*0.000*	*0.000*	*0.006*
	MedianNetProfitMargin		-0.0145	-0.0141	-0.0997	-0.0279	-0.0175	-0.0032
			0.011	*0.013*	*0.089*	*0.178*	*0.086*	*0.638*
Firm characteristics	Large		-0.0052					
			0.000					
	Small		0.0097					
			0.000					
	LogEquityMarket			-0.0028				
				0.000				
	MarketToBook		-0.00002	-0.00002	-0.00118	-0.00012	0.00001	-0.00001
			0.331	*0.472*	*0.013*	*0.277*	*0.927*	*0.642*
Deal characteristics	AllCash		-0.0010	-0.0009	0.0034	0.0002	-0.0041	0.0007
			0.407	*0.451*	*0.733*	*0.956*	*0.069*	*0.661*
	AllEquity		-0.0036	-0.0037	0.0045	0.0063	-0.0134	-0.0006
			0.028	*0.023*	*0.719*	*0.246*	*0.000*	*0.747*
	Competed		0.0029	0.0035	0.0304	0.0029	0.0018	0.0034
			0.060	*0.021*	*0.082*	*0.653*	*0.585*	*0.034*
	Conglomerate		-0.0005	-0.0005	-0.0055	-0.0021	-0.0015	0.0003
			0.605	*0.661*	*0.524*	*0.548*	*0.442*	*0.796*
	Hostile		-0.0105	-0.0095		-0.0239	-0.0217	-0.0071
			0.176	*0.221*		*0.636*	*0.320*	*0.327*
	Private		-0.0018	-0.0025	-0.0054	-0.0004	-0.0026	-0.0018
			0.134	*0.033*	*0.556*	*0.910*	*0.212*	*0.220*
	Public		-0.0199	-0.0191	0.0478	-0.0325	-0.0212	-0.0177
			0.000	*0.000*	*0.014*	*0.000*	*0.000*	*0.000*
	RelativeSize		0.0032	0.0028	0.0008	0.0173	0.0003	-0.0043
			0.000	*0.000*	*0.586*	*0.000*	*0.880*	*0.010*
	TenderOffer		0.0074	0.0075	-0.0508	0.0184	0.0065	0.0068
			0.002	*0.002*	*0.145*	*0.109*	*0.230*	*0.006*
	Observations	19,853	18,940	18,940	682	2,597	5,896	9,765
	Adj. R^2	0.002	0.022	0.024	0.020	0.025	0.019	0.020
	HomogeneousIndustry = HeterogeneousIndustry	***	-	-	-	-	-	-
	Fixed effects	Year, Country	Year, Country	Year, Country	Year, Country	Year, Country	Year, Country	Year, Country

Table 4.6: Number and volume of acquisitions sorted by acquirer size

This table displays the average number and volume of acquisitions per firm and year in each acquirer market value of equity decile. It reports the difference between deciles and difference tests based on t-tests for equality in means together with p-values. The sample contains all mergers and acquisitions between 1990 and 2006 as listed by Thomson Financial's SDC Platinum where the acquirer could be matched with Worldscope.

Acquirer market value of equity decile	Firm-years	Average number of acquisitions (per firm and year)	Difference between deciles	t-test for equality in means	Average total acquisition volume in million U.S. $ (per firm and year)	Difference between deciles	t-test for equality in means
1	30,662	0.062			0.3		
2	31,082	0.094	0.032	10.16	0.6	0.3	5.41
3	31,180	0.119	0.025	6.67	1.2	0.5	5.28
4	31,084	0.149	0.030	6.92	2.0	0.9	4.66
5	31,012	0.185	0.035	6.72	3.2	1.2	5.02
6	31,285	0.224	0.040	6.40	5.2	2.0	7.33
7	31,175	0.274	0.050	7.08	9.2	4.1	9.73
8	31,091	0.341	0.067	8.38	16.4	7.2	9.81
9	31,169	0.406	0.065	7.10	35.9	19.5	12.43
10	30,754	0.688	0.282	22.73	205.7	169.8	15.54

Table 4.7: Variable means by acquisition type

This table displays means and the differences of means between acquisition types for 32 variables used in the analysis. See Table 4.2 for a definition of all variables. The difference tests are based on t-test for equality in means. Data on mergers and acquisitions is obtained form Thomson Financial's SDC Platinum. Accounting data are taken from Worldscope and market data from Datastream.

Variable	Quiet Life (1)	Empire Building (2)	Other Acq (3)	Difference (1) - (2)	t-test for equality in means	Difference (1) - (3)	t-test for equality in means	Difference (2) - (3)	t-test for equality in means
#Deals	0.6	7.3	2.1	-6.7	*91.23*	-1.5	*55.17*	5.2	*72.29*
#DealsIndustry	337.0	208.7	174.8	128.3	*9.29*	162.2	*11.98*	33.9	*7.15*
#Firms	679.3	403.5	411.5	275.8	*13.03*	267.8	*12.85*	-8.0	*1.01*
Acquirer CAR(-1, 1)	-0.005	0.004	0.007	-0.008	*2.97*	-0.011	*4.02*	-0.003	*3.11*
Acquirer CAR(-5, 5)	-0.008	-0.001	0.004	-0.007	*1.66*	-0.011	*2.81*	-0.005	*3.05*
AcqVolume	108	1,133	229	-1,026	*23.63*	-122	*5.68*	904	*22.23*
AcqVolumeIndustry	77,842	38,166	28,890	39,676	*13.77*	48,952	*17.38*	9,276	*9.69*
AllCash	0.332	0.590	0.556	-0.258	*16.29*	-0.225	*14.65*	0.034	*4.58*
AllEquity	0.316	0.158	0.166	0.158	*10.40*	0.150	*10.05*	-0.008	*1.50*
Assets	10,458	13,543	6,733	-3,085	*1.46*	3,725	*1.86*	6,810	*8.36*
Competed	0.126	0.155	0.129	-0.029	*2.60*	-0.003	*0.32*	0.026	*4.90*
Conglomerate	0.000	0.440	0.460	-0.440	*73.76*	-0.460	*105.31*	-0.019	*2.60*
DealSize	1,192	457	362	736	*4.85*	830	*5.59*	94	*2.39*
DeltaSizeRank	30.0	11.8	17.5	18.2	*7.25*	12.5	*4.89*	-5.7	*5.24*
EquityMarket	3,649	4,559	2,623	-910	*2.22*	1,027	*2.63*	1,937	*11.09*
Herfindahl	0.046	0.067	0.075	-0.021	*8.32*	-0.030	*12.24*	-0.009	*6.46*
HeterogeneousIndustry	0.044	0.110	0.110	-0.066	*8.77*	-0.067	*9.38*	0.000	*0.06*
HomogeneousIndustry	0.350	0.420	0.359	-0.069	*4.23*	-0.009	*0.57*	0.060	*8.08*
Hostile	0.006	0.003	0.005	0.003	*1.26*	0.001	*0.29*	-0.002	*2.69*
Large	0.459	0.656	0.459	-0.197	*11.89*	0.000	*0.01*	0.197	*27.41*
LiquidityIndex	0.071	0.048	0.041	0.023	*7.27*	0.030	*9.88*	0.007	*5.42*
MarketToBook	6.120	3.931	3.707	2.189	*1.17*	2.413	*1.29*	0.224	*1.15*
MedianNetProfitMargin	0.101	0.119	0.095	-0.018	*6.15*	0.006	*2.03*	0.024	*16.06*
MixedIndustry	0.606	0.470	0.530	0.136	*8.10*	0.076	*4.66*	-0.060	*7.87*
Private	0.251	0.426	0.423	-0.175	*11.85*	-0.172	*12.12*	0.003	*0.42*
Public	0.542	0.146	0.228	0.397	*24.59*	0.315	*19.69*	-0.082	*14.60*
RelativeSize	0.452	0.187	0.251	0.265	*12.18*	0.201	*9.54*	-0.064	*6.21*
Small	0.056	0.012	0.049	0.043	*5.93*	0.006	*0.83*	-0.037	*15.96*
Target CAR(-1, 1)	0.126	0.121	0.127	0.005	*0.33*	-0.001	*0.07*	-0.006	*0.44*
Target CAR(-5, 5)	0.129	0.130	0.129	-0.001	*0.07*	0.000	*0.01*	0.001	*0.07*
Tender	0.139	0.044	0.076	0.095	*8.55*	0.062	*5.63*	-0.032	*9.59*
Observations	1025	6914	13039						

Table 4.8: Announcement returns and defensive acquisitions

The table presents results for OLS regressions with acquirer CAR(-1, 1) as dependent variable. See Table 4.2 for a definition of all variables. For each independent variable, the table displays the slope estimate and, in italics, the p-value of the two-sided t-test. The p-values are based on robust standard errors with firm-clusters. Intercept is not displayed.

		(1)	(2)	(3)	(4)	(5)	(6)
Firm characteristics	EmpireBuildingDummy	-0.0029	-0.0028	0.0007	-0.0009	0.0002	-0.0030
		0.004	*0.008*	*0.660*	*0.608*	*0.896*	*0.007*
	QuietLifeDummy	-0.0113	-0.0120	-0.0066	-0.0059	-0.0064	-0.0058
		0.000	*0.000*	*0.025*	*0.047*	*0.031*	*0.050*
	Log#Deals			-0.0014		-0.0019	
				0.218		*0.131*	
	LogAcqVolume				0.00004	0.00028	
					0.913	*0.462*	
	LogEquityMarket			-0.0028	-0.0027	-0.0028	
				0.000	*0.000*	*0.000*	
	MarketToBook			-0.00002	-0.00002	-0.00002	-0.00003
				0.437	*0.400*	*0.432*	*0.234*
Industry characteristics	HomogeneousIndustry			-0.0021	-0.0014	-0.0020	-0.0025
				0.059	*0.195*	*0.075*	*0.025*
	HeterogeneousIndustry			-0.0024	-0.0017	-0.0025	-0.0025
				0.169	*0.320*	*0.158*	*0.157*
	LiquidityIndex			0.0032	-0.0009	0.0023	0.0036
				0.690	*0.909*	*0.778*	*0.654*
	Log#DealsIndustry			-0.0024		-0.0018	-0.0023
				0.000		*0.017*	*0.000*
	LogAcqVolumeIndustry				-0.0012	-0.0004	
					0.000	*0.238*	
	MedianNetProfitMargin			-0.0136	-0.0113	-0.0127	-0.0151
				0.007	*0.026*	*0.012*	*0.003*
Deal characteristics	AllCash			-0.0010	-0.0011	-0.0010	-0.0014
				0.441	*0.411*	*0.426*	*0.284*
	AllEquity			-0.0037	-0.0040	-0.0037	-0.0038
				0.065	*0.048*	*0.063*	*0.058*
	Competed			0.0035	0.0037	0.0035	0.0022
				0.039	*0.028*	*0.037*	*0.183*
	Conglomerate			-0.0009	-0.0010	-0.0010	-0.0008
				0.376	*0.360*	*0.354*	*0.435*
	Hostile			-0.0097	-0.0095	-0.0097	-0.0114
				0.115	*0.124*	*0.116*	*0.071*
	Private			-0.0026	-0.0029	-0.0026	-0.0010
				0.030	*0.014*	*0.027*	*0.380*
	Public			-0.0189	-0.0188	-0.0188	-0.0209
				0.000	*0.000*	*0.000*	*0.000*
	RelativeSize			0.0029	0.0030	0.0029	0.0042
				0.070	*0.056*	*0.068*	*0.010*
	TenderOffer			0.0074	0.0075	0.0074	0.0072
				0.002	*0.002*	*0.002*	*0.003*
	Observations	20,978	20,978	18,940	18,940	18,940	18,940
	Adj. R^2	0.001	0.003	0.024	0.023	0.024	0.020
	Fixed effects	no	Year, Country	Year, Country	Year, Country	Year, Country	Year, Country

Chapter V

Stealth Trading by Corporate Insiders

1 Introduction

In this chapter, we investigate stealth trading by corporate insiders.[129] Stealth trading is the strategy to break up trades into sequences of smaller trades in order to reduce their impact on market prices (Barclay and Warner, 1993). As a result, there is a non-monotonicity between trade size and price impact: Small trades have no price impact, but they do not generate significant trading profits and are therefore unattractive. Large trades reveal more of the trader's information. Therefore, they have a larger price impact, which makes them less profitable. Supposedly, medium-sized trades then provide an optimal trade-off between the desired scale of the transaction and the objective to conceal information and they are therefore the strategy of choice. Barclay and Warner (1993) and the subsequent literature have documented this non-monotonicity for stock and option markets by investigating the informativeness of trades of different sizes.[130] However, this non-monotonicity provides only indirect evidence of stealth trading.[131] In this chapter, we provide direct evidence by investigating a class of traders for whom we can directly identify all their trades: the officers and directors of companies. We investigate how much and under what circumstances company insiders split their trades

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[129] This chapter is based on joint work with Ernst Maug, therefore I retain the personal pronoun "we", used in the original paper, throughout this chapter. All figures and tables are gathered at the end of the chapter. We thank Bohui Zhang for sharing the TAQTIC data with us. We are grateful to Piers Trepper and seminar participants at the conference of the TR/SFB 15 in Caputh for helpful comments. We gratefully acknowledge financial support of the collaborative research centers SFB 504 "Rationality Concepts, Decision Making and Economic Modeling" and TR/SFB 15 "Governance and the Efficiency of Economic Systems" at the University of Mannheim and the Rudolf von Bennigsen-Foerder foundation for financial support.

[130] Chakravarty (2001), Chakravarty, Gulen, and Mayhew (2004), and Anand and Chakravarty (2007).

[131] Chakravarty (2001) identifies the class of traders (institutional or individual) from the account type in the clearing records, but his data cannot identify individual traders.

by looking at sequences of repeated trades in the same direction.[132] We analyze is the profitability of stealth trading and how it differs from non-stealth trading where trades are not split.

The issue of stealth trading is especially important for corporate insiders, because these traders gain their information by virtue of their relationship with the company. Their trading behavior is therefore of independent interest and the subject of a separate and large literature.[133] Regulators in most countries have outlawed informed insider trading and have tightened regulations and reporting requirements considerably over the last one or two decades (Bhattacharya and Daouk, 2002). We are interested in the extent to which regulation affects stealth trading and whether stealth trading allows insiders to gain additional advantages from their informational position.

In our analysis, we first show that stealth trading of insiders exists and that it is pervasive. Then we formulate two hypotheses based on the fact that the stock price change caused by a trade consists of two components. First, a transitory component, which compensates the market maker (or other intermediary) for providing liquidity and second, a permanent component reflecting the new information revealed by the trade (Barclay and Warner, 1993). Since both components increase with transaction size, an insider can increase her trading profit by splitting her transactions into pieces and spread them over time, whether or not she trades on private information.

The *information-content hypothesis* assumes that insiders are informed traders and that stealth trading allows them to use their private information more profitably. Barclay and Warner (1993) argue, based on Kyle (1985) and Admati and Pfleiderer (1988), that informed traders have an incentive to spread their information over time in order to have their trades matched

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[132] We use the term "insider trading," "insiders," and related formulations exclusively in order to refer to legal trades as reported to the regulator by persons who are classified as insiders by applicable insider trading laws. The term "directors' dealings" as used in the U.K. is arguably more precise (see Fidrmuc, Goergen, and Renneboog, 2006), but their definition is not quite applicable to the U.S. context.

[133] This is a large literature to which we cannot do any justice in this article. Bainbridge (1999) is a good survey. The earliest contributions we could trace are Rogoff (1964), Lorie and Niederhoffer (1968), Pratt and DeVere (1970), Scholes (1972), Jaffe (1974), and Finnerty (1976).

with those of more liquidity traders. If their information is long-lived, then they have an incentive to spread it over the entire period of time before this information becomes public. Insiders have to resolve one additional trade-off compared to other informed traders, because insiders have to disclose their trades to a regulator and can therefore not keep their information private indefinitely. Disclosure requirements limit the period over which they can usefully spread their trades. The *information-content hypothesis* implies that insiders split their trades when they have more information or when the information asymmetry between insiders and other investors is larger. Also, from this perspective stealth trading should be used more by those insiders who have more access to private information in the company.

By contrast, the *price-impact hypothesis* considers insiders simply as large traders who use stealth trading in order to reduce the price impact of their trades. According to this view, insiders are in principle no different from any other trader, except that they seem to trade larger stakes than other investors. In an anonymous and finitely liquid market, large trades will have an impact on market prices even if trades are not caused by private information. The *price-impact hypothesis* therefore postulates that insiders use stealth trading in illiquid markets and whenever they are on the short side of the market and trading becomes more difficult.

Both hypotheses are not mutually exclusive because any transaction based on private information of course also has a transitory price impact and transactions not based on private information still reveal some new information and hence have a permanent component as well. Since we cannot directly measure both components of the price impact, we will develop below six testable sub-hypotheses. Therefore, we understand the *information-content* and *price-impact hypotheses* more as systematization to facilitate the discussion of the sub-hypotheses.

When analyzing the factors that influence the probability of stealth trading, we find that stealth trades in aggregate (i.e., the sum over all trades of the whole sequence of trades) are much larger than non-stealth trades. Stealth trading is more frequent if many insiders trade at

the same time in the same direction and when insiders are on the short side of the market. Additionally, stealth trading is more prevalent in opaque and less liquid firms. Controlling for other factors, stealth trading occurs more for purchases than for sales. The group of insiders using stealth trading most frequently is non-management insiders followed by the chairmen of the board and CEOs. Overall, we interpret these findings as more supportive for the *price-impact* than for the *information-content hypothesis*.

The Sarbanes-Oxley-Act (SOX) reduced the time insiders have to disclose their trades from up to forty calendar days to just two business days. At a first glance, this regulation should have reduced the scope for stealth trading. However, there is no evidence that this change in regulation substantially reduced stealth trading by insiders. Instead, we find that insiders adapted to the regulatory change by executing their stealth trades over a shorter period.

Finally, we perform multivariate regression analyses to evaluate the profitability of stealth trading for insiders. It seems that insiders can indeed reduce the price impact of their trades by stealth trading.

The argument proceeds as follows. We describe the main features of the relevant institutional framework and the construction of our data set in Section 2. In Section 3, we establish that stealth trading of corporate insiders actually exists. We develop our hypotheses on different aspects of stealth trading and test them in Section 4. We analyze the impact of SOX in Section 5. In Section 6, we examine the profitability of stealth trading for insiders and in Section 7, we evaluate whether it is more profitable for outsiders to mimic stealth than non-stealth trades. Section 8 concludes.

2 Institutional framework and data

2.1 Institutional framework

According to Section 16 of the Securities Exchange Act of 1934, all insiders have to disclose their transactions to the SEC. Insiders are direct and indirect beneficial owners of more than

ten percent of any class of equity securities and any director or officer of the issuer of equity securities (Section 16(a)(1) of the Securities Exchange Act of 1934, SEC rule 16a-2). Traditionally, insider transactions had to be reported on a monthly basis within 10 days after the end of each calendar month in which the transaction occurred (Form 4), which gave insiders up to forty days to disclose their trades. In 2002, the Sarbanes-Oxley Act (SOX) changed this practice. Since August 29, 2002, insiders have to report their trades within two business days (SEC rule 16a-3(g)). Small acquisitions, which do not exceed $10,000 in market value within six months (SEC rule 16a-6), are exempt from these reporting requirements. These small acquisitions are not reported on Form 4 as usual insider transactions but on Form 5, which is due only within 45 days after the issuer's fiscal year end (SEC rule 16a-3(f)).

2.2 Construction of the data set

Our data source for insider transactions is the Insider Filing Data Feed (IFDF) provided by Thomson Reuters. IFDF is based on three forms insiders have to file with the SEC: Form 3 ("Initial Statement of Beneficial Ownership of Securities"), Form 4 ("Statement of Changes of Beneficial Ownership of Securities"), and Form 5 ("Annual Statement of Beneficial Ownership of Securities"). We include all open market purchases and sales as well as private transactions between January 1, 1996 and December 31, 2006 with complete data (including CUSIP, transaction date, and disclosure date) on IFDF.

Insert Table 5.1, Table 5.2, and Table 5.3 here

Table 5.1 provides the definition of all variables used in our study and Table 5.2 provides the details of the construction of our data set. Table 5.3 displays some descriptive statistics for the variables in our data set. We extract 2,432,168 transactions for 137,806 insiders from 16,522 firms. 26.7% of these transactions are purchases and the remaining 73.3% are sales. We lose about 15% of the observations because the firm is not listed on CRSP and another 2.7% because the stock data available on CRSP are insufficient to compute cumulated abnormal re-

turns. We also delete all transactions where the number of shares in the transaction (as reported on IFDF) exceeds the number of shares traded on the exchange on the same day (as reported by CRSP); these transactions (about 5%) are most likely privately negotiated and therefore not of interest for our analysis. We have a small number of cases where insiders trade in different directions on the same day (about 0.7%) and where the transaction data on IFDF is incomplete (about 0.3%). We delete these transactions. We are left with 1,855,068 transactions by 97,205 insiders of 9,563 firms, or 76.3% of the raw data. Of these 20.9% are purchases and 79.1% are sales.

The data for bid-ask spreads is taken from the TAQTIC database and available only for NYSE-firms. Therefore, the sample size declines by two thirds for those analyses where we use the two spread variables (*EffectiveSpread* and *RelativeSpread*) in our analysis.

3 Definition and existence of stealth trading

We regard a transaction as a stealth trade if there exists a subsequent transaction in the same direction and by the same insider before or on the same day where the first transaction is disclosed. The reason for this definition is that stealth trading is relevant only for the period where the information, respectively the trade, have not been disclosed. Disclosure requirements changed with SOX on August 29, 2002. However, before and after SOX insiders did sometimes not comply with these regulations. Therefore, we use the actual rather than the mandated disclosure date to identify sequences of stealth trades. We define the maximum length of a stealth trading sequence to be 40 days. If the first trade of a stealth trading sequence is not reported after 40 days, then we consider this sequence to be finished to avoid sequences that stretch over extremely long periods.[134]

The first step of our analysis is to establish that stealth trading even exists. The evidence in the extant literature is indirect and does not establish a clear-cut criterion that defines stealth

[134] These 40 days define the upper legal bound for reporting most insider trades before SOX became effective.

trading. We consider the clustering of trades by the same person in the same direction as evidence for stealth trading. Absent stealth trading, insiders' trades should be uncorrelated over time, i.e., if an insider executes purchases with probability *p* and sales with probability *1-p*, then this unconditional probability *p* should be equal to the conditional probability given that the last transaction was a sale. A symmetric argument applies to purchases. We first perform univariate tests to see whether the unconditional probability and the conditional probability of a sale given the direction of the previous transaction are the same. In addition, we perform multivariate tests to control for other factors that may lead insiders to cluster their trades.

Insert Table 5.4 here

Table 5.4 (Panel A) reports the results for the univariate tests. Since we need the sign of the previous transaction, the calculations do not include the first transaction for each person. Table 5.4 shows that trades are clustered. In total, 20.9% of all transactions are purchases and 79.1% are sales (see Table 5.3). Yet, conditional on the previous transaction being a sale (purchase), the next transaction is also a sale (purchase) in 98.7% (96.8%) of all cases. We use a standard Chi-squared test and a Fisher test to test for the statistical significance of these differences and find that the p-values are below 0.01% in both cases. We repeat the analysis for sub samples of the data where the next transaction is restricted to occur within six months (column (2)) and within 40 days (column (3)) of the first transaction. The six months restriction is motivated by the short-swing rule, which requires insider to disgorge all profits from trading in the opposite direction (e.g., first buying and then selling) in shares of their own company within six months. The 40-day restriction is motivated by the pre-SOX regulation, which gave insiders a maximum of 40 days to disclose their trades. As expected, we see that insiders are more likely to trade in the same direction if transactions are closer to each other, although these differences are economically insignificant.

In Table 5.4 (Panel B), we address the same question with a standard Probit model, where the dependent variable equals one if the transaction is a purchase, and regress it on the same dummy variable for the previous transaction (*LagPurchaseDummy*). Many papers document the influence of investor sentiment on investment decisions of retail investors and asset prices (see, for example, Lee, Shleifer, and Thaler, 1991). If insiders behave like retail investors we expect that they buy stocks more frequently if investor sentiment is high and sell stocks more frequently if investor sentiment is low. In contrast, if insiders behave rationally we expect exactly the opposite pattern because insiders may recognize that stock prices are temporarily misvalued. In regression (2) in Table 5.4B we control for investor sentiment, following Lemmon and Portniaguina (2006) and Qiu and Welch (2006), by including *CCI*, the consumer confidence index, as an independent variable. The insider trading literature has shown that insiders often purchase (sell) shares after periods of negative (positive) abnormal stock performance.[135] Seyhun (2000) calls these contrarian trades passive transactions. We control for this insider behavior by including two additional independent variables in model (3) and (4): past stock performance measured by *RunupCAR*, the abnormal return over the 20 trading days before the transaction, and *StockTercile*, which is the tercile of the stock return in the calendar month before the transaction of all sample companies with sufficient data for this period. Both variables measure the relative development of firm's stock price in the month before an insider transaction. Model (5) includes all four independent variables. Across all these regressions, the coefficient of *LagPurchaseDummy* is close to 0.94, which means that the conditional probability that the next transaction is again a purchase is about 94%. This is economically significantly different from its unconditional probability and statistically significant at all conventional significance levels. The statistically significant coefficient on *CCI* shows that investor sentiment influences insiders similar to retail investors. However, the impact is economically small: a one point increase in consumer confidence increases the likelihood that the

[135] Rozeff and Zaman (1998), Lakonishok and Lee (2002), Jenter (2005), and Fidrmuc, Korczak, and Korczak (2009) find that insiders on aggregate are contrarian investors.

next transaction is a purchase by 0.06%. The impact of *StockTercile* is negative, which shows that insiders are contrarians: if the stock has performed relatively well over the previous calendar month, then they are significantly less likely to purchase additional shares, where an upward move from the bottom to the middle or from the middle to the top tercile reduces the probability by 2.5%.[136] Interestingly, *RunupCAR*, the return relative to the index before the first transaction has no significant impact. All observations also hold for the model, which includes all control variables. Therefore, we conclude from this analysis that stealth trading is pervasive. Insiders are much more likely to purchase (sell) shares if the previous transaction was also a purchase (sale). Our subsequent discussion formulates and tests hypotheses about how stealth trades differ from non-stealth trades and when and why stealth trading occurs.

4 Who undertakes stealth trading and when?

In this section, we investigate the two main hypotheses, the *price-impact* and the *information-content hypothesis*, by testing six different sub-hypotheses that potentially explain who undertakes stealth trading, when it is undertaken, and how the market reacts to the disclosure. For this purpose, we aggregate sequences of stealth trades into aggregate trades and refer to these as aggregate stealth trades. If we analyze individual trades of a stealth trading sequence, we refer to them as single stealth trades. The aggregation of stealth trades is important because we are interested in the characteristics of the firms, the liquidity of the market for their stock, and the identity of the insiders rather than in the characteristics of individual trades. Aggregating stealth trades is particularly relevant when we wish to compare the volume or stake of stealth trades to those of single trades, because then we are interested in the size of the entire sequence and not only in the size of its components. For each hypothesis, we will first discuss the univariate evidence presented in Table 5.5 and Table 5.6 before we turn to the multivariate results presented in Table 5.7. The dependent variable in the multivariate analysis is *Stealth*,

[136] Fidrmuc, Goergen, and Renneboog (2006) find for the U.K. that abnormal returns before insider purchases (sales) are significantly negative (positive) and conclude that insiders can time their trades.

which is equal to one if the trade is an aggregated stealth trade, and zero otherwise. Since all hypotheses refer to the same dependent variable, we combine these variables in one regression in order to avoid omitted variable bias. We collect the results in Table 5.7, but discuss each hypothesis and the respective variables in turn. Since we have spread data only for NYSE stocks (about one third of all trades), we repeat the analysis of models (3) and (4) for the smaller sample (model (5) and (6)).

4.1 The price-impact hypothesis

Liquidity. The objective of stealth trading is to reduce the price impact of a trade. Accordingly, we expect that stealth trading is more attractive if the price impact of trades is large, which is the case in illiquid markets, for larger trades, and if more insiders want to trade in the same direction at the same time. The attractiveness for insiders to break up larger trades rather than smaller trades is further increased if there are fixed costs from trading.

Hypothesis 1 (Liquidity): *Stealth trading is more likely (1) in less liquid stocks, (2) for larger (in aggregate) trades, and (3) if more insiders trade in the same direction at the same time.*

Liquidity is a somewhat elusive concept and we use four different proxies for our analysis. The first proxy is *RelativeSpread*, which is the quoted bid-ask spread, expressed as a proportion of the midpoint of the spread. Then we use *EffectiveSpread*, which is defined as $ES_t = 2|P_t - M_t|/M_t$, where M_t is the midpoint of the quotes and P_t is the price at which the transaction is executed (see Chordia, Roll, and Subrahmanyam, 2001). Finally, we use the *Amihud* measure, which is defined as the average ratio of the daily absolute return to the dollar trading volume on that day (Amihud, 2002). Finally, some of the literature relates trading volume to market liquidity (e.g., Brennan and Subrahmanyam, 1995), although the strength and significance of this relationship is not clear (for a critical point of view see Lesmond, 2005). We include *Turnover*, defined as the total number of shares traded on the day of the transaction day divided by the total number of shares outstanding. We measure the size of

trades with two different variables: *Volume* is the volume of a transaction denoted in thousand U.S. $ and *Stake* is the percentage of shares outstanding traded in the transaction.

Insert Table 5.5 here

The univariate results in Table 5.5 shows that single stealth trades are only about half as large as non-stealth trades (median *Volume*: $28,800 vs. $56,600, median *Stake* 0.004% vs. 0.011%). However, aggregate stealth trades are about four times larger than non-stealth trades (median *Volume*: $260,300 vs. $56,600, median *Stake* 0.049% vs. 0.011%). It seems that insiders indeed prefer to split-up large trades rather than small trades. Figure 5.1 and Figure 5.2 plot *Volume* and *Stake* for single stealth trades, aggregated trades, and non-stealth trades over the sample period. We observe that before SOX there was on average no large difference in size between single stealth trades and non-stealth trades. After SOX the average size of single stealth trades and aggregated stealth trades is somewhat reduced. However, aggregated stealth trades are substantially larger than non-stealth trades over the whole sample period. In our multivariate analysis, we will control for changes over time by including a SOX dummy and year dummies in all regressions.

Insert Figure 5.1and Figure 5.2 here

We also use the definition of trade size introduced by Barclay and Warner (1993). They define transactions as small if the number of shares is less than 500, as medium-size if the number of shares is at least 500 but less than 10,000, and as large if at least 10,000 shares are traded. Barclay and Warner (1993) find that the price impact is largest for medium-size trades and conclude that informed traders use stealth trading to camouflage their information by spreading their trades over time. We categorize all trades into three groups: *SmallTrade* (less than 500 shares), *MediumTrade* (500 to 9,999 shares), and *LargeTrade* (10,000 or more shares). The results in Table 5.5 show that most non-stealth trades (54.6%) and single stealth trades (54.3%) fall indeed into the category *MediumTrade*, which is in line with Barclay and

Warner's results (in their sample 45.7% of trades are medium-size) and corroborates their presumption that informed traders mostly execute medium-size transactions. However, in our sample small transactions make up only 16.6% of non-stealth trades and 28.5% of stealth trades, compared to 52.6% in Barclay and Warner. However, the main difference between the two samples is that insiders execute many more large trades 28.2% of non-stealth trades and 17.2% of stealth trades, compared to only 1.7% in the Barclay and Warner sample. Hence, insiders trade on average larger stakes than other investors in the stock market, which is un-surprising given that insiders (which also include large shareholders with more than 10% ownership) are wealthier with large stakes in the company. Overall, we find strong evidence in support of Hypothesis 1 that insiders split large trades into medium-sized and small trades.

Insert Table 5.6 here

In Table 5.6 we analyze the presence of stealth trading across firms, to see whether stealth trading is more common in firms with illiquid stocks. We order all 49,901 firm-years in our sample according to the proportion of stealth trading of all insider transactions in a given firm and year and assign them to quintiles (1=lowest and 5=highest proportion of stealth trading). We report average and median market capitalization, sales, turnover, volatility, and the two spread variables. There exists a negative relationship between stealth trading and market capi-talization as well as sales: the larger the firm, the lower the proportion of stealth trading. Only the lowest stealth trading quintile is an exception. It seems that the smallest firms also have the lowest proportion of stealth trading. We can make a similar observation when looking at turnover, volatility, and spreads. These variables all increase with stealth trading, but the firms with the lowest proportion of stealth trading have the highest median spreads. Despite the fact that the relationships described are not purely monotonic, this analysis shows that, in general, the proportion of stealth trading is higher for smaller firms, for more volatile firms, and for illiquid stocks. The univariate results in Table 5.6 are therefore in line with Hypothesis 1,

stealth trading is more likely in less liquid stocks. However, we find a positive relationship between the proportion of stealth trading and daily stock turnover, which questions this interpretation. We note again that some of the microstructure literature considers turnover to be a poor proxy of liquidity and trading costs (e.g., Lesmond, Ogden, Trzcinka, 2005). Table 5.6 shows that the proportion of stealth trades of all insider transactions is related to firm size. Therefore, we control for the log of market capitalization in all regressions.

Insert Table 5.7 here

For our multivariate analysis in Table 5.7 we group transactions into deciles according to the percentage stake that is traded in the transaction and define the variable *StakeDecile* accordingly, which is a number between 1 (= 10% of trades with the lowest percentage of shares outstanding traded in the transaction) and 10 (=10% of trades with the largest stake traded). In all regressions in Table 5.7 *StakeDecile* is positive and significant with p-values smaller than 0.1%.[137] The economic significance is also quite substantial: An upward move by one decile from the mean increases the probability of stealth trading by 8.5% to 8.8%. Hence, as predicted by Hypothesis 1, (aggregated) trade size increases the likelihood of stealth trading; insiders break up larger stakes rather than smaller stakes. This result corroborates our univariate results in Table 5.5, Figure 5.1, and Figure 5.2, which show that single stealth trades are smaller, but aggregated stealth trades are substantially larger than non-stealth trades.

The multivariate analysis also supports our conclusion from Table 5.6 that stealth trading is more prevalent in firms with illiquid stocks. Both spread measures and *Turnover* are all highly significant and have the predicted sign: The higher the spread and the lower turnover, the higher is the incidence of stealth trading, showing that stealth trading is concentrated in infrequently traded, illiquid stocks. The only measure of liquidity that is not significant is the

[137] Using *VolumeDecile* instead of *StakeDecile* yields, qualitatively and quantitatively similar results (not tabulated).

Amihud measure, which is arguably a less precise measure than the quoted spread or the effective spread.

The hypothesis that insiders tend to use more stealth trading if also other insiders trade in the same direction is corroborated by the positive and highly significant coefficient for the dummy variable *MultipleInsiders*, which is one if more than one insider trades in the same direction on the same day. The likelihood of stealth trading increases by more than 4% if at least one other insider is trading in the same direction. Therefore, we conclude, in line with Hypothesis 1, that stealth trading is a strategy to reduce market impact, especially for large trades, illiquid stocks, and in situations when other insiders also execute transactions.

Market environment. It is generally easier to sell shares in rising markets when there is more demand (bull markets), and to buy shares in falling markets, when there is a larger supply (bear markets). It is more difficult to be on the short side of the market, i.e., buy when other investors want to buy and vice versa. We reason that the increased difficulty of trading when other investors want to trade in the same direction will result in increased incentives to split trades. Effectively, this difficulty of trading should have the same impact as a reduction in liquidity, an argument we develop in relation to Hypothesis 1 above. Hence, we expect that stealth trading is more likely if insiders are on the short side of the market.[138]

Hypothesis 2 (Market environment): *Stealth trading differs in bull markets and in bear markets: There is more stealth buying in rising markets and more stealth selling in falling markets.*

We cannot measure the direction in which other traders want to trade directly and infer it from recent price movements instead. We conduct this analysis at the firm level and at the market level. At the firm level, we classify insider transactions according to the recent share price performance of the insider's company assuming that it is more difficult for insiders to buy

[138] See Chiyachantana, Jain, Jiang, and Wood (2004) and Chakravarty, Kalev, and Pham, 2005.

(sell) shares if the stock of their company has over (under) performed compared to all other stocks in the market. We classify a stock as "overperforming" if its return was in the top tercile of all stock returns in the sample in the month before the transaction. Analogously, a stock is "underperforming" if its return was in the bottom tercile in the previous month (see also the definition of *StockTercile*, which we used above). We then define a dummy variable *ShortSideStock*, which equals one if the transaction is on the short side of the market, i.e., if the transaction is a purchase and the stock was overperforming, and also if the transaction is a sale and the stock was under performing. At the market level, we classify insider transactions with reference to the recent overall market development. If last month's return (before the insider transaction) on the CRSP value-weighted index was in the highest tercile of all monthly returns in our sample period, the market is considered "bullish" and vise versa as "bearish" if the index return was in the lowest tercile. Accordingly, we define the dummy variable *ShortSideMarket*, which equals one if the transaction is a purchase and the market was "bullish," or if the transaction is a sale and the market was "bearish." Under Hypothesis 2, we should see that the coefficient on *ShortSideStock* (*ShortSideMarket*) is positive, so that there is more stealth buying if the stock (market) outperformed ("bullish") and more stealth selling if the stock (market) underperformed ("bearish").

The results in Table 5.7 show that the coefficient of *ShortSideStock* always has the predicted sign and it is highly significant in all regressions. By contrast, the coefficient of *ShortSide-Market* is insignificant across all specifications. Therefore, we conclude that insiders use stealth trading more often when they are on the short side of the market. However, only the market conditions for the firm's stock is relevant, whereas overall market trends have no significant impact on insiders' decisions to split trades.

4.2 The information-content hypothesis

Information hierarchy. Several papers in the insider trading literature investigate the "information hierarchy hypothesis" (Seyhun, 1986), which holds that trades by those insiders who have more information have a higher price impact.[139] We should therefore expect that insiders who are more informed and who have more information to hide will engage more in stealth trading because they face more adverse selection problems.

Hypothesis 3 (Information hierarchy): *Stealth trading is more likely for insiders who are more informed.*

Based on our data we can distinguish between the CEO, officers and directors other than the CEO, directors who are not officers, the chairman of the board, and other insiders who hold none of these roles (mostly large shareholders).

Insert Table 5.8 here

Before we interpret the multivariate regression results from Table 5.7 in relation to the information hierarchy hypothesis, we discuss the univariate results presented in Table 5.8. The univariate results show that CEOs, chairmen of the board, and other insiders use stealth trading most frequently, whereas other officers and directors use stealth trading less than all other categories of insiders. The findings regarding CEOs and chairmen of the board support the information hierarchy hypothesis, whereas the findings regarding other insiders contradict it. Other insiders are mostly large shareholders, who own more than 10% of the shares of the company but do not have a formal role in the firm. These insiders trade relatively large volumes (mean volume per transaction is $416,100) compared to CEOs ($294,000), officers ($262,100) and directors ($279,300). Only chairmen trade on average larger volumes

[139] In the literature on insider trading, the information hierarchy hypothesis holds that trades by insiders who are closer to the firm have a larger information content. The evidence on this hypothesis is mixed. Seyhun (1986) shows that the directors and officers trade on more valuable information than other insiders. Lin and Howe (1990) show that trades by the CEO and the officers and directors of the firm have a higher information content than those of unaffiliated shareholders. Fidrmuc, Goergen, and Renneboog (2006) find no evidence for the information hierarchy hypothesis.

($420,500). Measuring transaction size by *Stake* reveals a similar picture. In this case, other insiders actually execute the largest transactions on average. Given that other insiders trade relatively large volumes, possibly because they hold large stakes in the firm, they have strong incentives to split trades. The final verdict on the information hierarchy hypothesis should therefore rely on multivariate regressions that also control for transaction size.

The regression analysis in Table 5.7 includes dummy variables for all categories of insiders except directors, so the coefficients for the four remaining insider groups have to be interpreted relative to this group. The multivariate results are consistent with the univariate analysis. The coefficients for *OtherInsider* are positive and significantly larger than the coefficients of all other insider groups across all specifications, even though we control for *StakeDecile.* This result is inconsistent with the information hierarchy hypothesis unless we assume that officers and directors are less informed than other insiders, which we find implausible. Across all specifications, chairmen and CEOs do more stealth trading than other officers and directors. However, this difference is only significant for the large sample (model (3) and (4)). The finding that CEOs and chairmen are more inclined to stealth trading than officers and directors are consistent with the information hierarchy hypothesis. Nonetheless, the overall support for this hypothesis is only mixed. Interestingly, the results for chairmen and for other insiders are stable across specifications and therefore independent of how we control for liquidity. By contrast, the coefficient for CEO is much larger and that for officers is much smaller in the larger sample compared to the NYSE-subsample.

Direction of trade. The insider trading literature has shown that purchases have a larger information content compared to sales, probably because sales are more likely to be motivated by liquidity considerations, whereas purchases are more likely to be motivated by information

advantages.[140] Our hypothesis is that stealth trading is a strategy to hide trades with a larger information content, so that stealth trading should be related to the direction of trades.

Hypothesis 4 (Direction of trade): *Stealth trading is more frequent for purchases than for sales.*

The univariate results in Table 5.5 suggest exactly the opposite of Hypothesis 4, namely that stealth trading is more likely for sales than for purchases. Only 25.1% of all aggregated stealth trades are purchases, whereas 36.9% of all non-stealth trades are purchases. However, this could be explained by the fact that sales are on average much larger (across all insider groups) than purchases and therefore offer more scope for stealth trading. As in the case of the information hierarchy hypothesis, we have to control for trade size to test Hypothesis 4.

Table 5.7 shows that the coefficient of *PurchaseDummy* has the predicted sign in all specifications but is statistically significant only in models (3) and (4), where we can use the large sample. In the smaller sample for which also the spread variables are available, the effect is statistically insignificant. Hence, when we control for trade, firm and insider characteristics, stealth trading is more frequent for purchases than for sales. The fact that *PurchaseDummy* is insignificant in all models that use the small sample suggests that the sample size is the reason for the insignificant coefficient and not the fact that we control for the spread in models (1) and (2).

Asymmetric information. Stealth trading should be more attractive if the general scope for informed trading is larger. This will be the case if there is more asymmetric information, for example, in companies that are more opaque, in companies with more firm-specific risk, and

[140] The first to make this observation was Rogoff (1964). See Lakonishok and Lee (2001), Jeng, Metrick, and Zeckhauser (2003) or Fidrmuc, Goergen, and Renneboog (2006) for more recent analyses.

at times before an earnings announcement, whereas it will be less likely immediately after an earnings announcement.[141]

Hypothesis 5 (Asymmetric information): *Stealth trading is: (1) more likely if there is more asymmetric information and if the company is more opaque; (2) more likely in stocks with more firm-specific risk; (3) more likely before and less likely after earnings announcements.*

We investigate part (1) of Hypothesis 5 by looking at reporting periodicity and research and development expenditures as measures of firms' transparency or opacity. We identify firms with higher quality accounts with *QuarterlyReport*, which is one for firms that file quarterly reports and zero otherwise. *R&D* is defined as research and development expenditures scaled by total assets. *R&D* is set to zero for those firms, where Compustat does not report any research and development expenditures. We analyze part (2) by using *Volatility*, defined as the annualized standard deviation of daily stock returns over the calendar month preceding the transaction. We use this as a measure of firm-specific risk.[142] Part (3) of Hypothesis 5 is analyzed by looking at earnings announcements reported by Compustat. We define two dummy variables *BeforeEarnAnnounce* and *AfterEarnAnnounce,* which equal one for a period of two weeks (14 days) before, respectively after an earnings announcement.

The impact of *QuarterlyReport* is as predicted and always significant at the 5% level, although the vast majority of our sample firms report earnings quarterly and therefore the empirical relevance is only limited (the mean of *QuarterlyReport* is 0.999, see Table 5.3). The results for *R&D* are in line with Hypothesis 5. The coefficient for *R&D* is positive and significant at the 0.1% level across all models, which implies that insiders from firms with higher R&D expenditures use more stealth trading. A one standard deviation increase of *R&D*

[141] Aboody and Lev (2000) show that insider gains are larger for R&D-intensive firms and interpret R&D as a proxy for asymmetric information. Fidrmuc, Goergen, and Renneboog (2006) and Betzer and Theissen (2009) investigate the impact of news announcements on insider trading.

[142] Results do not change materially if we use the standard deviation of daily excess returns from a market model as a proxy for firm specific risk, where we use the CRSP-value weighted index over the preceding calendar year as a measure of market risk.

(from the mean) increases the probability of stealth trading by 2% to 6%. The picture for *Volatility* is somewhat mixed. The coefficient is positive as predicted and highly significant in regressions (3), (4), and (5), but insignificant in regressions (1), (2), and (6). There are two potential explanations why we obtain different results for these regressions. Regressions (1) and (2) include spread variables, whereas regressions (3) and (4) do not. The first interpretation could be that the spread already controls to some extent for firm-specific risk. Alternatively, the different results may just be due to the smaller sample used in models (1) and (2). The results from models (5) and (6), which repeat the analysis of models (3) and (4) for the smaller sample, suggest that the first interpretation is more likely, because of the highly significant coefficient for *Volatility* in model (5). However, the result from model (6), where the coefficient of *Volatility* has the predicted (positive) sign but is insignificant also lends some support to the second interpretation. The coefficient for *BeforeEarnAnnounce* is always positive, but only significant for models (3) and (4) where we can use the large sample. Therefore, it seems that insiders use stealth trading more frequently in periods when there is more asymmetric information. However, we do not find that insiders use less stealth trading after earnings announcements, when asymmetric information should be less severe, which partly contradicts Hypothesis 5. The coefficient of *AfterEarnAnnounce* is positive and significant across all models, not only for the large sample. This result indirectly supports the *price-impact hypothesis* (more precisely Hypothesis 1). Bettis, Coles, and Lemmon (2000) show that about 92% of their sample firms impose trading restrictions for insiders and that the most common trading window is 3 to 12 days after earnings announcements. These results are corroborated by our summary statistics in Table 5.3, where we can see that about 20% of the sample transactions are executed in the two weeks after an earnings announcement. If we assume a uniform distribution of trades across the year and four earnings announcements per year, we should expect only 15.4% of all transactions to be executed in the two weeks after an

earnings announcement.[143] It seems that in many firms all insiders (have to) trade at the same time right after an earnings announcement. In such a situation stealth trading offers insiders the possibility to reduce the price impact of their transactions by matching them with those of more liquidity traders. We tentatively conclude from this analysis that reducing the price impact of insider trades is a more important motive for stealth trading than camouflaging the information content of these transactions. However, we also find some evidence that asymmetric information leads to more stealth trading.

If the motivation behind stealth trades is to conceal information, then stealth trades should systematically contain more information than non-stealth trades. We should therefore expect that the disclosure of stealth trades contains a stronger signal than the disclosure of non-stealth trades. Therefore, we hypothesize:

Hypothesis 6 (Information content): *The information content of stealth trades is larger than that of comparable non-stealth trades.*

We measure the information content of trades by using standard event study methods. Abnormal returns are calculated over a 1-day event window using market model benchmark returns calculated with the CRSP value-weighted index. The event day is the disclosure of the first trade in a stealth trading sequence or the disclosure date of non-stealth trades. We calculate abnormal returns on the disclosure date separately for purchases (*PurchaseAR*) and for sales (*SalesAR*).

The univariate comparison of stealth trades and non-stealth trades in Table 5.5 shows that the information content is approximately the same for both types of trades. This result holds for purchases and for sales. The mean (median) of *PurchasesAR* is 0.2% (0.0%) for non-stealth trades compared to 0.3% (0.0%) for stealth trades. The mean (median) of *SalesCAR* is -0.1% (-0.1%) for non-stealth trades compared to -0.1% (-0.2%) for stealth trades.

[143] About 99.9% of our sample transactions come from firms with quarterly reporting, therefore 8 out of 52 weeks per calendar year (15.4%) fall into the category *AfterEarnAnnounce*.

Insert Table 5.9 here

The results from univariate and multivariate regressions in Table 5.9 confirm the results from Table 5.5. Stealth trades do not seem to have more information content than non-stealth trades. The coefficients for *Stealth* are economically insignificant in all regressions. The coefficient for *Stealth* has different signs for univariate regressions than for multivariate regressions; it only has the predicted sign in the univariate regressions. Therefore, we find no support for the hypothesis that stealth trades contain more information than non-stealth trades.

5 Stealth trading and regulation

Unlike other traders, insiders have to file their trades with regulators after a certain period of time, so their ability to split trades is limited. Most likely, the benefit from concealing their trades from other traders is lost or at least diminished once the first trade is disclosed, and after SOX insiders had shorter intervals over which they could spread their trades (see Section 2.1 above).[144] Therefore, we hypothesize:

Hypothesis 7 (Regulatory change): *(1) The incidence of stealth trading declines after SOX became effective on August 28, 2002, so that stealth trades make up a smaller proportion of the number of trades and of trading volume. (2) Stealth trades become more concentrated in the shortened reporting period after SOX.*

Based on the first part of Hypothesis 7 we expect the SOX-dummy in Table 5.7 to be negative. In fact, the SOX-dummy is positive, even though the coefficient is not significant in four out of six specifications. Only the specifications that use the large sample have significantly negative coefficients for the SOX-dummy.

Insert Figure 5.3 here

[144] A recent literature investigates the impact of the Sarbanes-Oxley Act (SOX) on insider trading (as well as a range of other governance-related issues). See Cheng, Nagar, and Rajan (2007) and Brochet (2008) on insider trading and Brockman, Martin, and Puckett (2008) on stock option exercises.

The significance of the SOX-dummy in Table 5.7 may be spurious and pick up a general time trend that is not causally associated with the Sarbanes-Oxley act. To investigate this further we plot the number, volume, and the average stake traded in Figure 5.3. The figure reveals a trend, which is reversed temporarily after SOX became effective. The figure does not suggest a permanent change because of SOX, but rather a trend that existed a long time before SOX, was then interrupted briefly, and continued from 2004 onwards. Panel B of Figure 5.3 plots the total volume (in U.S. $) of stealth trades relative to the total volume of all insider transactions, and total stakes traded (as a percentage of all shares outstanding) in stealth trades relative to the total stakes traded in all insider transactions over the sample period. Both time series are more volatile than the corresponding series in Panel A and do not exhibit a clear trend. Both time series show also a significant decline around time when SOX became effective. Table 5.10 presents univariate tests for the hypothesis that the characteristics of stealth trades reported in the table are identical for the pre-SOX and the post-SOX period. We report a standard t-test for differences in means and the Wilcoxon ranksum test. The Wilcoxon-test has slightly lower power but is more robust to outliers and deviations from normality than the t-test, however, it also rejects if the median is identical and the standard deviation is substantially different between two samples. The comparisons in Table 5.10 reveal that the differences between the pre-SOX and the post-SOX period in terms of stakes traded and volume per individual trade are statistically and economically significant. However, while the drop in the volume of the median individual trade is significant (from $49,700 to 29,200 shares per trade), the drop of the median volume of a sequence of stealth trades (from 263,000 shares to 259,800 shares) is insignificant.

Insert Table 5.10 here

Table 5.10 reveals also that stealth trading by insiders increases in terms of the number of transactions, which become more concentrated into a shorter period of time. The time span

between the first and the last trade decreases by a factor of 6 from 8.14 to 1.33, and the time span between two consecutive trades in a sequence decreases by a factor of 11 from 1.89 to 0.17, implying that more trades of a stealth trading sequence now take place within a single day.

Insert Figure 5.4 and Figure 5.5 here

Figure 5.4 and Figure 5.5 plot these developments again to distinguish trends from one-off changes that can be attributed to SOX. Figure 5.4 reveals that the time span between the first and the last trade of a stealth trading sequence was increasing for a number of years before SOX and then dropped sharply from about 10 days to less than 2 days in August 2002. Figure 5.5 plots the average time span between two stealth trades of the same sequence and shows that this time span shortened from 2.5 days to 1.5 days before the date when SOX became effective and then dropped by another day to about 0.5 days around that date.

Insert Figure 5.6 here

We are interested in the average number of stealth trades in a stealth trading sequence. This number increases from 5.29 pre-SOX to 8.88 post-SOX (see Table 5.10). Figure 5.6 reveals a trend in the number of transactions that begins in 1998 and continues until the end of our sample period, without indicating a structural break at any particular date. The steady increase in splitting stealth trades into more pieces does therefore not seem to be affected by SOX. Only the temporary drop in the second half of 2002 may be related to SOX.

Insert Figure 5.7 here

Figure 5.7 shows that the shortened reporting period mandated by SOX let insiders to substantially increase the speed of their reporting. The average number of days between trading and reporting date decreased from above 40 days to approximately 3 days shortly after SOX becomes effective. We do not observe a significant difference in reporting delay between stealth and non-stealth trades.

Taking the results from Table 5.7, Table 5.10 and Figure 5.3 to Figure 5.7 together shows that insiders do not abstain from stealth trading because of SOX. To the contrary, the number and the proportion of stealth trades increases steadily over our sample period, with a temporary drop in the months immediately after SOX became effective. Rather, insiders adjusted their trading behavior to the new rules. They split transactions into a larger number of smaller trades, execute these trades faster (often several trades in one day) so that trades became more concentrated in a much shorter time span, and disclose these trades sooner to comply with the new regulation.

6 The profitability of stealth trades

The object of splitting trades is to realize larger trading profits. Ideally, we would like to investigate if this strategy is actually successful. Hence, we want to compare a non-stealth trade of a given size with a comparable sequence of stealth trades. We postulate:

Hypothesis 8 (Insider profitability): *Stealth trading is more profitable compared to non-stealth trading.*

Testing this hypothesis requires that non-stealth trades and sequences of stealth trades are comparable. In particular, we need to compare sequences of stealth trades that have the same aggregate volume as a non-stealth trade. Ultimately, we ask the counterfactual question what the trading profits of insiders would have been if they had not broken up their trades. However, if all insiders trade optimally, then they choose stealth trades if stealth trading is optimal, and single trades otherwise, so that we can never observe the suboptimal trades that we need as a benchmark. Without using intraday data, there are basically two possible approaches to tackle this question. First, we could use standard event-study methodology to analyze insider returns. Second, we could use a standard matching or propensity matching approach, where we match each sequence of stealth trades with one non-stealth trade of the same company in the same year and with a comparable size and discard observations where we cannot find such

a trade. Since, most papers in the insider trading literature use event-study methodology we follow the same approach. Applying this technique to stealth trading is not straightforward though. With stealth trading, there is more than one beginning date from which we calculate CARs. For example, in a sequence of stealth purchases, we could measure CARs from the date of the first purchase, but then there is an upward bias simply because the subsequent purchases may push up the price, thereby artificially generating a positive CAR. Conversely, if we measure CARs from the date of the last purchase we avoid this pitfall, but then the price impact of the later trades underestimates the profitability of the earlier transactions. We therefore estimate the profitability of stealth trading with a slightly different approach.

To fix ideas, consider a sequence of stealth trades $\left\{x_j, P_j^S\right\}_{j=1}^{j=N}$, where N trades in the same direction are executed with quantities x_j at prices P_j^S. Here j indexes trades and not time, so there can be multiple trades on the same day and also days without trading. Denote by P_{-1} the stock price immediately before the first trade in the sequence and by $\bar{x} \equiv \sum_{j=1}^{j=N} x_j$ the size of the aggregated trade. Then we would like to calculate the average price at which insiders trade:

$$\bar{P} = \frac{\sum_{j=1}^{j=N} x_j P_j^S}{\bar{x}}. \tag{5-1}$$

The ratio $\bar{P}/P_{-1}$ measures the price impact of the series of stealth trades. In order to convert this to returns, define the return for trade j of the sequence by $r_j \equiv P_j^S/P_{-1} - 1$ and the weight of the j^{th} trade in the transaction by $\alpha_j \equiv x_j/\bar{x}$. Then we wish to measure:

$$\frac{\bar{P}}{P_{-1}} - 1 = \sum_{j=1}^{j=N} \alpha_j r_j. \tag{5-2}$$

We can apply our usual analysis with cumulative abnormal returns in order to control for simultaneous movements in the market and define:

$$CAR_j\left(-1,t_j\right)=r_j-r_M\left(-1,t_j\right). \tag{5-3}$$

Here t_j denotes the day of the j^{th} trade and $r_M\left(-1,t_j\right)$ is the market return from the closing price before the first trade in the stealth trading sequence (normalized to be -1) to the closing price on date t_j. Note that the calculation differs from standard CAR-calculations because r_j is not the return based on the closing price, but is based on the actual transaction price. Ideally, we would match this with the return on the benchmark at the time of the transaction, but since we do not have time stamps for insiders' transactions, we use the closing price instead. A benchmark-adjusted measure of price impact is then:

$$\sum_{j=1}^{j=N}\alpha_j CAR_j\left(-1,t_j\right). \tag{5-4}$$

Equation (5-4) provides a measures of the price impact of stealth trades. The challenge is to benchmark these measures of price impact against a measure of the hypothetical price impact of a single trade with total size $\bar{x}$. We want to compare this to the hypothetical price P^A the insider would have paid for the aggregate trade of size $\bar{x}$ and hence to the ratio P^A/P_{-1}. If $P^A>\bar{P}$ for purchases ($P^A<\bar{P}$ for sales), then stealth trading is profitable.

The raw returns and *CARs* for single insider trades are measured over the time interval from the closing price of the day before the transaction until the execution of the trade with $r=P^{NS}/P_{-1}-1$ and $CAR\left(-1,t\right)=r-r_M\left(-1,t\right)$.

In a simple univariate approach we compare the CAR defined in (5-4) with the equivalent numbers of non-stealth trades and single stealth trades. Our results in Table 5.5 support Hypothesis 8 that stealth trading is more profitable for insiders than non-stealth trading. The

abnormal price change induced by insider trades is significantly smaller for single stealth trades than for non-stealth trades both for purchases (*InsiderImpactPurchases*) and for sales (*InsiderImpactSales*). The mean of *InsiderImpactPurchases* is 7.8% for non-stealth trades compared to only -0.6% for single stealth trades. The mean of *InsiderImpactSales* is -1.6% for non-stealth trades compared to only 0.4% for single stealth trades. However, the medians for both variables are almost the same for non-stealth and single stealth trades.

Insert Table 5.11 here

Table 5.11 reports multivariate regression results with *InsiderImpactPurchases* and *Insider-ImpactSales* as dependent variables and *Stealth* as an independent variable. The regressions also control for other observable characteristics of trades, namely for trade size (by using *StakeDecile*), for the role of the insider, and whether more than one insider traded on the same day in the same direction (*MultipleInsiders*). Additionally, we control for firm characteristics such as size, turnover, and volatility and whether the transaction was executed before or after SOX became effective. We report the results for OLS (columns (1) to (4)) and for a specification where we winsorize the dependent variable at the 1% level (columns (5) to (8)). We run the regression separately for purchases and for sales and report one specification with controls and one specification without controls.

Stealth trading reduces the price impact of insider trading for purchases and for sales. The coefficient of *Stealth* is highly significant at all conventional significance levels and always has the expected sign, i.e. it is negative for purchases and positive for sales. Hence, stealth trading reduces the average purchase price and increases the average sales price. The coefficient on *Stealth* is never reduced much from the inclusion of controls, even though most control variables have a highly significant influence on price impact. The impact of outliers seems to be quite strong and the coefficient on *Stealth* is much smaller in absolute value for the winsorized regressions, so we only discuss the latter here. Stealth trading reduces the ab-

normal price impact for purchases by about 1.39%-1.65% and for sales by about 0.43%-0.49%, which is a significant reduction given the mean abnormal price impact of 4.5% for purchases and -0.5% for sales reported in Table 5.3. The summary statistics of *InsiderImpactPurchases* and *InsiderImpactSales* indicate that both variables are relatively volatile measures, which exhibit some extreme values (see Table 5.3).

7 The profitability of mimicking trades

Mimicking trades are trades by outsiders who can observe insider trades and then trade in the same direction. Mimicking trades are puzzling from the point of view of semi-strong form efficient markets. The earlier insider trading literature has investigates the profitability of trading on publicly available information (see Jaffe, 1974; Seyhun, 1986; Rozeff and Zaman, 1988; Lin and Howe, 1990).[145] The evidence from these papers suggests that there are positive abnormal returns even after the disclosure date of insider trades, but that after adjusting for risk factors and transactions costs outsiders cannot exploit this public information. In contrast, Bettis, Vickrey, and Vickrey (1997) argue that it is possible for outsiders to earn abnormal returns by focusing on large-volume trades of high-ranking insiders, most likely because large transactions of high-ranking insiders contain more valuable inside information, which the market does not fully incorporate at the time of disclosure of the trade. A possible explanation for this market inefficiency could be that most investors do not follow the SEC filings closely, because the information content of most transactions is rather small and does not warrant the effort. This explanation was suggested by Chang and Suk (1998), who find significant abnormal stock performance not only at the SEC filing but also at the publication in the *Wall Street Journal* "Insider Trading Spotlight" column. If the motivation behind stealth trades is to conceal valuable information and if insiders do not follow the SEC filings closely, then we

[145] The phenomenon has been investigated also for the U.K. (Gregory, Matatko, Tonks, and Purkis, 1994), Germany, Italy, and the Netherlands (Heidorn, Meyer, and Pietrowiak, 2004) and Spain (Del Brio, Miguel, and Perote, 2002). Betzer and Theissen (2009) provide a tabular survey of the more recent studies: Fidrmuc, Goergen, and Renneboog (2006), Friederich, Gregory, Matatko, and Tonks (2002), Lakonishok and Lee (2001), and Chang and Suk (1998).

should expect that mimicking stealth trades right after the SEC filing is more profitable than mimicking non-stealth trades. We therefore hypothesize:

Hypothesis 9: (Outsider profitability): *Imitating stealth trades is more profitable than imitating non-stealth trades.*

Outsider returns are estimated as abnormal returns using standard event study methods. The event day (t=0) is the first disclosure date of stealth trading sequences or the disclosure date of non-stealth trades. We assume that outsiders observe the filing of an insider transaction at t=0 and can trade at the closing price of the same day. Therefore, abnormal returns are calculated over a 20-day event window (1, 20) starting the next trading day after the disclosure. We use the CRSP value-weighted index as benchmark return for the market model.[146] The cumulated abnormal returns are calculated separately for purchases (*PurchasesCAR*) and for sales (*SalesCAR*).

The univariate comparison of non-stealth trades and stealth trades in Table 5.5 shows that it is significantly more profitable for outsiders to imitate stealth trades than non-stealth trades. This result holds for purchases and for sales. The mean (median) of *PurchasesCAR* is 2.2% (0.6%) for non-stealth trades compared to 3.6% (1.4%) for stealth trades. The mean (median) of *SalesCAR* is -2.3% (-1.6%) for non-stealth trades compared to -3.1% (-2.1%) for stealth trades. All these differences are statistically significant at all conventional significance levels.

Insert Table 5.12 here

The results from univariate regressions in Table 5.12 confirm the univariate results from Table 5.5, namely that imitating stealth trades is more profitable than imitating non-stealth trades. The coefficients for *Stealth* are statistically and economically highly significant for sales and purchases as well as for winsorized and non-winsorized dependent variables. Imitating stealth trades would increase CARs to outsiders between 0.74 and 1.41 percentage points

[146] Robustness checks (not tabulated) with shorter event windows yield similar results.

for a 20-day event period. However, when we control for other trade characteristics, insider characteristics, and firm characteristics the effect of stealth trading completely vanishes for purchases and actually changes its sign for sales. The results of the multivariate regressions for sales actually imply that imitating stealth trading is significantly less profitable than imitating non-stealth trades. Therefore, we find only very limited support for Hypothesis 9 and cannot conclude that imitating stealth trading is more profitable for outsiders than imitating non-stealth trades.

8 Conclusions

Our analysis provides direct evidence that insiders in the U.S. engage in stealth trading and split large transactions into sequences of smaller orders. Almost 87% of all insider transactions are part of a sequence of stealth trades during our sample period from 1996 to 2006 and there is an upward trend in the proportion of stealth trades relative to all insider transactions. The impact of the Sarbanes-Oxley-Act in 2002 was only temporary. Insiders did not stop to split their transactions into series of smaller trades and only changed their trading behavior to comply with tightened disclosure regulation. We hypothesize that stealth trading is used more for transactions with a larger informational content and more in markets that are less liquid or where the insider trades on the short side of the market. We find several pieces of evidence in support of the *price-impact hypothesis*. In particular, insiders are more likely to split trades into series of smaller transactions if the total size of the stake is large and if the market is comparatively illiquid. Insiders use stealth trading more frequently when they are on the short side of the market, i.e. when they purchase in rising markets and when they sell in falling markets. We compare the price impact of stealth trades with that of non-stealth trades. We can only draw tentative conclusions here because this comparison is fraught with methodological difficulties, but our results indicate that stealth trading is a successful strategy to reduce price impact.

The relevance of the informational content of trades is less clear. The main finding in support of the *information-content hypothesis* is that insiders use stealth trading more for purchases than for sales. Purchases of insiders should have more informational content than sales because sales are more likely motivated by liquidity considerations. The *information-content-hypothesis* implies that insiders of more opaque firms and firms with more firm-specific risk should use stealth trading more frequently, but we find only limited evidence here. Under the *information-content hypothesis*, stealth trading should be used more by those insiders with more information (information hierarchy hypothesis). Surprisingly, insiders without a formal role in the firm (e.g., large shareholders) are more likely to use stealth trading compared to officers and directors of the company, which contradicts the information hierarchy hypothesis. These insiders seem to split their trades because they trade larger stakes and not because they have more information. Finally, a larger information content of stealth trades should result in larger announcement returns on the disclosure date, which we do not find.

Our results therefore suggest that insiders use stealth trading strategically and successfully to reduce the price impact of their trades. By contrast, it is less clear that insiders use stealth trading to camouflage trades with a stronger information content.

9 Tables

Table 5.1: Definitions of variables used in this chapter

This table defines all variables used in this chapter. Insider trading data are taken from IFDF, accounting data from Compustat, market data from CRSP and information about spreads from TAQTIC.

Variable	Description	Source
AfterEarn Announce	= 1 for all transactions executed in the 14 days after an earnings announcement (if available), zero otherwise	Compustat
Amihud	Amihud's measure of illiquidity defined as the average ratio of the daily absolute return to the dollar trading volume on that day (Amihud, 2002)	Datastream
BeforeEarn Announce	= 1 for all transactions executed in the 14 days before an earnings announcement (if available), zero otherwise	Compustat
CCI	Consumer confidence index based on a monthly survey of 5,000 U.S. households conducted for The Conference Board. The index averages five indexes, each of which is based on a question regarding current or expected economic conditions and respond	Datastream
CEO	= 1 if trade is executed by the CEO, zero otherwise	IFDF
ChairmanBoard	= 1 if trade is executed by the chairman of the supervisory board, who is not an officer, zero otherwise	IFDF
DaysAfter	Number of days elapsed between the current purchase (sale) and the last purchase (sale) of the same insider occurred	IFDF
DaysBefore	Number of days elapsed between the current purchase (sale) and the next purchase (sale) of the same insider occurs	IFDF
Delay	Number of days between the trading day and the disclosure day	IFDF
Director	= 1 if trade is executed by a member of the board (not including the chairman) who is not an officer, zero otherwise	IFDF
EffectiveSpread	Daily average of $2\|P_t - M_t\|/M_t$, where M_t is the midpoint of the quotes and P_t is the price at which a transaction is executed; Observations with *EffectiveSpread*>0.5 are set to missing value	TAQTIC
InsiderImpact Purchase	Weighted cumulative abnormal return as defined in Equation (5-4) for purchases	CRSP & IFDF
InsiderImpact Sales	Weighted cumulative abnormal return as defined in Equation (5-4) for sales	CRSP & IFDF
LargeTrade	= 1 if number of shares traded is ≥10000, zero otherwise	IFDF
LogMarketCap	= natural logarithm of *MarketCap*	CRSP
MarketCap	Market value of equity at the transaction date in million €	CRSP
MediumTrade	= 1 if number of shares traded is ≥500 and <10000, zero otherwise	IFDF
MultipleInsiders	= 1 if more than one insider trades on the same day in the same direction, zero otherwise	IFDF
Officer	= 1 if trade is executed by an officer (not including the CEO)	IFDF
PurchaseDummy	= 1 if the transaction is a purchase, zero otherwise	IFDF
PurchasesAR	Abnormal return (market model) at the disclosure day for purchases	IFDF
PurchasesCAR	Cumulative abnormal return (market model) over a 20-day event window (1, 20) starting after the disclosure day for purchases	CRSP
RelativeSpread	Average daily quoted bid-ask spread, expressed as a proportion of the midpoint of the spread; Observations with *RelativeSpread*>0.5 are set to missing value	TAQTIC

Variable	Description	Source
RunupCAR	Cumulative abnormal return over a 20-day event window (-20,-1) ending one day before the trading day for sales and purchases, CARs of sales are multiplied by -1	CRSP
R&D	= research and development expenditure / total assets	Compustat
Sales	Sales of the last calendar year in million €	Compustat
SalesAR	Abnormal return (market model) at the disclosure day for sales	CRSP
SalesCAR	Cumulative abnormal return (market model) over a 20-day event window (0,20) starting at the disclosure day for sales	CRSP
ShortSideMarket	= 1 for purchases (sales) if the previous calendar month's return of the CRSP value weighted index was in the highest (lowest) tercile of all sample months, zero otherwise	CRSP
ShortSideStock	= 1 for purchases if *StockTercile*=3; = 1 for sales *StockTercile*=1; zero otherwise	CRSP
SmallTrade	= 1 if number of shares traded is <500, zero otherwise	IFDF
SOX	= 1 if trade is executed after August 28, 2002, zero otherwise	IFDF
Stake	= Number of shares traded by insider / total number of shares	IFDF/ CRSP
StakeDecile	Decile of the *Stake* traded in the transaction of all sample transactions, ranging between 1 (lowest) and 10 (highest)	IFDF/ CRSP
Stealth	= 1 for all transactions of a trading sequence, where the first transaction is only disclosed after (or on the same day) the insider has traded in the same direction again	IFDF
StockTercile	Tercile of the firm's stock return in the previous calendar month of all sample firm's stock returns, ranging between 1 (lowest) and 3 (highest)	CRSP
Turnover	= total number of shares traded on the transaction day / total number of shares	CRSP
Volatility	Annualized standard deviation of daily stock returns over the preceding calendar month	CRSP
Volume	Volume of the transaction in thousand U.S. $	Compustat

Table 5.2: Sample design

This table displays how our sample is constructed from raw Thomson Reuters Insider Filing database (IFDF) data to our final sample. We include all open market and private transactions in the IFDF database (Table One) between January 1, 1996 and December 31, 2006 in our initial data set. We report the losses of observations after matching the IFDF data with CRSP, because of missing information, and consistency checks.

	Transactions	%	Firms	Insider
IFDF data	2,432,168	100.0%	16,522	137,806
Observations lost because of:				
Missing stock data on CRSP	372,463	15.3%		
Missing price or volume information on IFDF	6,526	0.3%		
Purchases and sales by the same insider on the same day	17,089	0.7%		
# shares traded > total # of shares traded at the same day	116,316	4.8%		
Insufficient data for event window or estimation period	64,706	2.7%		
Final sample	1,855,068	76.3%	9,563	97,205

Table 5.3: Summary statistics

This table displays descriptive statistics for 29 variables used in our analysis. See Table 5.1 for a definition of all variables. Insider trading data are taken from IFDF, accounting data from Compustat, market data from CRSP and information about spreads from TAQTIC.

Variable	N	Mean	Median	Standard deviation	Min	Max
AfterEarnAnnounce	1,855,068	0.200	0	0.400	0	1
Amihud	1,774,488	2.765	0.004	206.543	0	59,685
BeforeEarnAnnounce	1,855,068	0.045	0	0.206	0	1
CCI	1,855,068	107.117	105.100	17.782	61.4	145
CEO	1,855,068	0.177	0	0.382	0	1
ChairmanBoard	1,855,068	0.123	0	0.329	0	1
DaysAfter	1,708,233	33.335	0	139.874	0	3927
DaysBefore	1,709,243	33.396	0	139.976	0	3927
Delay	1,855,068	21.010	4	74.931	0	3635
Director	1,855,068	0.407	0	0.491	0	1
EffectiveSpread	613,345	0.36%	0.12%	0.94%	0.00%	50.00%
InsiderImpactPurchases	147,357	0.045	0.000	0.311	-3.544	2.543
InsiderImpactSales	325,645	-0.005	-0.001	0.147	-4.613	9.950
MarketCap (in million $)	1,855,068	8,521	761	30,968	0	571,816
MultipleInsiders	1,855,068	0.400	0	0.490	0	1
Officer	1,855,068	0.409	0	0.492	0	1
OtherInsider	1,855,068	0.162	0	0.369	0	1
PurchaseDummy	1,855,068	0.209	0	0.407	0.000	1.000
PurchasesAR	147,357	0.002	0.000	0.044	-0.514	1.012
PurchasesCAR	147,357	0.027	0.009	0.175	-1.854	7.138
QuarterlyReport	1,770,028	0.999	1	0.038	0	1
R&D	1,770,028	0.047	0.000	0.096	0.000	3.956
RelativeSpread	613,379	0.43%	0.14%	1.10%	0.02%	50.00%
RunupCAR	473,002	-0.030	-0.019	0.181	-8.928	3.130
Sales (in million $)	1,736,672	3,371	466	12,962	0	345,977
SalesAR	325,645	-0.001	-0.002	0.034	-0.692	1.293
SalesCAR	325,645	-0.027	-0.018	0.150	-1.746	4.091
ShortSideMarket	1,855,068	0.266	0	0.442	0	1
ShortSideStock	1,855,068	0.233	0	0.423	0	1
SOX	1,855,068	0.588	1	0.492	0	1
Stake	1,855,068	0.036%	0.004%	0.234%	0.000%	65.804%
Stealth	1,855,068	0.869	1	0.337	0	1
StockTercile	1,836,305	2.185	2	0.820	1	3
Turnover	1,855,068	0.017	0.007	0.071	0.000	14.228
Volatility	1,838,268	0.517	0.409	0.405	0.011	15.589
Volume (in thousand $)	1,855,068	301	31	3,289	0	883,742

Table 5.4: Existence of stealth trading

Panel A: Univariate analysis

This table displays the percentage of transactions, which are followed by a transaction in the same direction (separated for purchases and sales). Please note that the total number of transactions is reduced and the percentage of sales is different compared to the original sample because the first transaction of each individual insider in each firm can only be used as benchmark for the next transaction by the insider in the respective firm.

	(1)	(2)	(3)
Observations	All without first for each person	Only within 183 days of each other	Only within 40 days of each other
Same Direction			
Sales	98.7%	99.6%	99.8%
Purchases	96.8%	98.7%	99.4%
% Sales / Total	80.5%	81.0%	82.0%
# of observations	1,737,495	1,628,811	1,513,281
P-value Chi2-test	0.00%	0.00%	0.00%
P-value Fisher exact test	0.00%	0.00%	0.00%

Panel B: Probit regressions

The table presents results for Probit regressions with PurchaseDummy as dependent variable. See Table 5.1 for a definition of all variables. For each independent variable, the table displays the marginal effects (evaluated at the mean of the independent variables) and in parentheses, the t-statistic of the two-sided t-test for a coefficient equal to zero. In all regressions, t-statistics are based on heteroscedasticity-consistent standard errors. Additionally, the p-values of the F-test that the coefficient of *LagPurchaseDummy* is equal to its unconditional mean and McFadden's R^2 are reported.

	(1)	(2)	(3)	(4)	(5)
LagPurchaseDummy	0.9387	0.9364	0.9370	0.9387	0.9347
	(814.48)	(807.27)	(786.28)	(814.78)	(779.31)
CCI		0.0006			0.0005
		(37.90)			(35.76)
StockTercile			-0.0250		-0.0244
			(-79.56)		(-78.63)
RunupCAR				-0.0018	0.0023
				(-1.19)	(1.61)
Observations	1,737,495	1,737,495	1,720,191	1,737,495	1,720,191
Pseudo R^2	0.842	0.843	0.846	0.842	0.847
LagPurchaseDummy = 0.195	(0.0%)	(0.0%)	(0.0%)	(0.0%)	(0.0%)

Table 5.5: Summary statistics: non-stealth vs. stealth trades

This table compares descriptive statistics for 13 variables used in our analysis for stealth and non-stealth transactions. See Table 5.1 for a definition of all variables. For each variable, the table displays in parentheses, the p-value of the two-sided t-test on the equality of means and the p-value of the Wilcoxon rank-sum test.

Variable	N	Mean	Median	N	Mean	Median	T-test	Wilcoxon test
	Non-stealth trades			Single stealth trades				
SmallTrade	243,087	0.166	0	1,613,351	0.285	0	(0.0%)	(0.0%)
MediumTrade	243,087	0.546	1	1,613,351	0.543	1	(0.4%)	(0.4%)
LargeTrade	243,087	0.289	0	1,613,351	0.172	0	(0.0%)	(0.0%)
Volume	243,087	480.0	56.6	1,613,351	274.1	28.8	(0.0%)	(0.0%)
Stake	243,087	0.066%	0.011%	1,613,351	0.031%	0.004%	(0.0%)	(0.0%)
PurchaseDummy	243,087	0.369	0	1,613,351	0.185	0	(0.0%)	(0.0%)
	Non-stealth trades			Aggregated stealth trades				
SmallTrade	242,779	0.164	0	230,223	0.038	0	(0.0%)	(0.0%)
MediumTrade	242,779	0.547	1	230,223	0.354	0	(0.0%)	(0.0%)
LargeTrade	242,779	0.289	0	230,223	0.608	1	(0.0%)	(0.0%)
Volume	242,779	480.6	56.9	230,223	1,920.8	261.4	(0.0%)	(0.0%)
Stake	242,779	0.066%	0.011%	230,223	0.219%	0.049%	(0.0%)	(0.0%)
PurchaseDummy	242,779	0.369	0	230,223	0.251	0	(0.0%)	(0.0%)
InsiderImpactPurchases	89,632	0.078	0.000	57,725	-0.006	-0.002	(0.0%)	(0.0%)
InsiderImpactSales	153,147	-0.016	-0.001	172,498	0.004	-0.001	(0.0%)	(0.0%)
PurchasesAR	89,632	0.002	0.000	57,725	0.003	0.000	(0.5%)	(51.4%)
PurchasesCAR	89,632	0.022	0.006	57,725	0.036	0.014	(0.0%)	(0.0%)
SalesAR	153,147	-0.001	-0.001	172,498	-0.001	-0.002	(93.7%)	(0.0%)
SalesCAR	153,147	-0.023	-0.016	172,498	-0.031	-0.021	(0.0%)	(0.0%)

Table 5.6: Stealth trading at the firm level

This table displays the mean and median for six firm level variables. Firms are grouped by their proportion of stealth trades relative to all insider transactions in a given year. StealthQuintile=1 contains those firm-year observations with the lowest proportion of stealth trading. StealthQuintile=5 contains those firm-year observations with the highest proportion of stealth trading. See Table 5.1 for a definition of all variables. *Turnover* is defined here as the average daily turnover of shares over the preceding calendar year. *Volatility* is defined here as the annualized standard deviation of daily excess returns (from market model) over the preceding calendar year.

StealthQuintile	Variable	N	Mean	Median
1	MarketCap	9977	2,001.4	140.3
	Sales	8605	1,723.8	136.5
	Turnover	9728	0.56%	0.31%
	Volatility	9722	56.83%	46.24%
	EffectiveSpread	2658	0.93%	0.36%
	RelativeSpread	2658	1.13%	0.48%
2	MarketCap	9981	3,236.4	304.3
	Sales	9166	2,391.2	259.3
	Turnover	9877	0.58%	0.35%
	Volatility	9874	49.43%	40.77%
	EffectiveSpread	3193	0.62%	0.29%
	RelativeSpread	3193	0.76%	0.37%
3	MarketCap	9979	2,968.1	282.2
	Sales	9085	2,145.0	216.9
	Turnover	9874	0.66%	0.40%
	Volatility	9874	55.71%	47.48%
	EffectiveSpread	2953	0.71%	0.30%
	RelativeSpread	2953	0.86%	0.38%
4	MarketCap	9982	2,638.4	303.3
	Sales	9091	1,749.5	215.9
	Turnover	9852	0.74%	0.47%
	Volatility	9852	60.81%	52.68%
	EffectiveSpread	2739	0.67%	0.28%
	RelativeSpread	2739	0.81%	0.36%
5	MarketCap	9982	1,876.7	164.7
	Sales	8678	1,225.6	139.7
	Turnover	9731	0.73%	0.45%
	Volatility	9726	68.24%	58.90%
	EffectiveSpread	2461	0.99%	0.34%
	RelativeSpread	2461	1.21%	0.44%
All	MarketCap	49901	2,544.2	229.3
	Sales	44625	1,855.0	189.1
	Turnover	49062	0.65%	0.39%
	Volatility	49048	58.18%	48.68%
	EffectiveSpread	14004	0.77%	0.31%
	RelativeSpread	14004	0.94%	0.40%

Table 5.7: Determinants of stealth trading

The table presents results for Probit regressions with Stealth as dependent variable. See Table 5.1 for a definition of all variables. For each independent variable, the table displays the marginal effects (evaluated at the mean of the independent variables) and, in parentheses, the t-statistic of the two-sided t-test for a coefficient equal to zero. In all regressions, p-values are based on heteroscedasticity-consistent standard errors. Additionally, the p-values of the F-tests for the equality of the coefficients on *CEO* and *Officer* as well as *ChairmanBoard* and *Director* are displayed. McFadden's R^2 is reported.

		(1)	(2)	(3)	(4)	(5)	(6)
	LogMarketCap	0.0457	0.0458	0.0492	0.0489	0.0447	0.0432
		(40.36)	*(40.23)*	*(88.57)*	*(86.42)*	*(42.25)*	*(40.90)*
	StakeDecile	0.0867	0.0867	0.0845	0.0838	0.0883	0.0864
		(124.56)	*(124.57)*	*(223.45)*	*(219.34)*	*(123.16)*	*(123.16)*
Hypothesis 1	EffectiveSpread	1.0405					
		(5.68)					
	RelativeSpread		0.9048				
			(5.73)				
	TurnoverDay			-0.2554		-2.3806	
				(-7.72)		*(-9.16)*	
	Amihud				0.00002		0.00020
					(1.69)		*(0.75)*
	MultipleInsiders	0.0419	0.0419	0.0464	0.04427	0.0473	0.04108
		(13.77)	*(13.77)*	*(27.47)*	*(25.92)*	*(15.28)*	*(13.40)*
	CEO	0.0048	0.0048	0.0086	0.0080	0.0039	0.0042
		(0.74)	*(0.74)*	*(2.68)*	*(2.46)*	*(0.60)*	*(0.64)*
Hypothesis 2	Officer	-0.0034	-0.0034	-0.0079	-0.0095	-0.0032	-0.0026
		(-0.96)	*(-0.97)*	*(-4.11)*	*(-4.86)*	*(-0.93)*	*(-0.74)*
	ChairmanBoard	0.0118	0.0117	0.0142	0.0152	0.0096	0.0127
		(1.75)	*(1.74)*	*(3.96)*	*(4.15)*	*(1.42)*	*(1.86)*
	OtherInsider	0.0832	0.0833	0.0817	0.0805	0.0821	0.0842
		(13.02)	*(13.03)*	*(24.41)*	*(23.50)*	*(12.80)*	*(13.07)*
	VolatilityMonth	-0.0111	-0.0113	0.0254	0.0197	0.0225	0.0030
		(-1.44)	*(-1.47)*	*(9.24)*	*(7.14)*	*(2.89)*	*(0.39)*
	QuarterlyReport	-0.1129	-0.1137	-0.1784	-0.1815	-0.1101	-0.1125
Hypothesis 3		*(-2.06)*	*(-2.08)*	*(-7.40)*	*(-7.41)*	*(-2.01)*	*(-2.06)*
	R&D	0.1978	0.1974	0.0643	0.0584	0.2095	0.2241
		(4.61)	*(4.59)*	*(6.24)*	*(5.59)*	*(4.82)*	*(4.92)*
	BeforeEarnAnnounce	0.0030	0.0031	0.0191	0.0191	0.0079	0.0044
		(0.40)	*(0.41)*	*(4.76)*	*(4.66)*	*(1.04)*	*(0.58)*
	AfterEarnAnnounce	0.0178	0.0178	0.0176	0.0177	0.0192	0.0176
		(5.13)	*(5.13)*	*(8.95)*	*(8.86)*	*(5.51)*	*(5.03)*
H. 4	PurchaseDummy	-0.0022	-0.0023	0.0249	0.0240	0.0009	-0.0014
		(-0.55)	*(-0.59)*	*(11.43)*	*(10.81)*	*(0.23)*	*(-0.36)*
H. 5	ShortSideStock	0.0157	0.0157	0.0125	0.0129	0.0148	0.0155
		(4.31)	*(4.31)*	*(6.28)*	*(6.37)*	*(4.04)*	*(4.21)*
	ShortSideMarket	0.0027	0.0027	-0.0025	-0.0033	0.0025	0.0032
		(0.80)	*(0.80)*	*(-1.36)*	*(-1.74)*	*(0.74)*	*(0.94)*
	SOX	0.0179	0.0180	-0.0186	-0.0166	0.0154	0.0169
		(1.69)	*(1.69)*	*(-3.07)*	*(-2.73)*	*(1.44)*	*(1.58)*
	Observations	140,566	140,566	444,278	427,491	140,566	138,559
	Pseudo R^2	0.146	0.146	0.138	0.137	0.148	0.146
	Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
	Industry dummies	Yes	Yes	Yes	Yes	Yes	Yes
F-test	CEO=Officer	(82.2%)	(82.3%)	(0.0%)	(0.0%)	(91.4%)	(80.0%)
	Chairman-Board=Director	(8.0%)	(8.3%)	(0.0%)	(0.0%)	(15.7%)	(6.3%)

Table 5.8: Stealth trading and the role of insider

This table displays for different roles of insiders the mean and median of five transaction variables separated for sales and purchases. See Table 5.1 for a definition of all variables.

		CEO		Officer		Chairman		Director		Other	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
Sales	Volume	329.7	27.6	291.0	49.0	468.5	36.8	341.2	35.3	573.1	42.8
	Stake	0.024%	0.002%	0.020%	0.003%	0.026%	0.002%	0.032%	0.004%	0.095%	0.009%
	InsiderImpactSales	-0.003	-0.003	0.002	-0.001	-0.001	-0.002	-0.001	-0.003	0.007	-0.001
	SalesAR	-0.001	-0.002	-0.001	-0.001	0.000	-0.001	-0.001	-0.002	-0.001	-0.001
	SalesCAR	-0.030	-0.023	-0.032	-0.021	-0.028	-0.020	-0.029	-0.020	-0.030	-0.023
	Stealth	0.951	1.000	0.859	1.000	0.954	1.000	0.909	1.000	0.951	1.000
Purchases	Volume	75.2	8.8	44.4	6.8	89.5	11.2	69.7	10.1	183.7	20.6
	Stake	0.040%	0.010%	0.026%	0.005%	0.046%	0.011%	0.037%	0.008%	0.066%	0.011%
	InsiderImpactPurchases	0.001	-0.004	0.020	-0.002	-0.007	-0.005	0.016	-0.003	-0.008	-0.003
	PurchasesAR	0.004	0.001	0.003	0.000	0.005	0.001	0.003	0.000	0.003	0.001
	PurchasesCAR	0.043	0.020	0.035	0.014	0.033	0.013	0.031	0.011	0.012	0.001
	Stealth	0.805	1.000	0.626	1.000	0.838	1.000	0.692	1.000	0.966	1.000
All	Volume	294.0	23.4	262.1	38.9	420.5	31.2	279.3	25.5	416.1	31.5
	Stake	0.026%	0.002%	0.021%	0.004%	0.029%	0.003%	0.033%	0.004%	0.083%	0.009%
	Stealth	0.931	1.000	0.832	1.000	0.939	1.000	0.859	1.000	0.957	1.000

Table 5.9: Abnormal disclosure day returns and stealth trading

The table presents results for OLS regressions with abnormal disclosure day returns as dependent variable. The 1-day event window is the disclosure date of the first transaction of a series of stealth trades or the disclosure date of a non-stealth trade. See Table 5.1 for a definition of all variables. For each independent variable, the table displays the slope estimate and, in parentheses, the p-value of the two-sided t-test for zero slope. In all OLS regressions, t-statistics are based on heteroscedasticity-consistent standard errors.

	Purchases		Sales		Purchases		Sales	
	OLS				OLS (Winsorized 1%)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Stealth	0.0007	-0.0006	0.0000	0.0003	0.0006	-0.0005	-0.0002	0.0001
	(2.72)	*(-2.12)*	*(0.08)*	*(2.10)*	*(2.74)*	*(-2.06)*	*(-1.59)*	*(1.13)*
LogMarketCap		-0.0003		-0.0002		-0.0002		0.0000
		(-3.79)		*(-3.04)*		*(-3.10)*		*(-0.90)*
StakeDecile		0.0004		0.0000		0.0003		0.0000
		(6.31)		*(-1.22)*		*(6.61)*		*(0.22)*
Turnover		0.0251		-0.0069		0.0183		-0.0059
		(3.17)		*(-2.91)*		*(3.08)*		*(-3.33)*
Volatility		0.0026		-0.0002		0.0016		-0.0017
		(4.08)		*(-0.28)*		*(3.38)*		*(-5.68)*
CEO		0.0004		0.0002		0.0004		0.0002
		(0.91)		*(0.71)*		*(0.88)*		*(0.81)*
Officer		0.0007		0.0002		0.0007		0.0003
		(1.84)		*(1.10)*		*(2.08)*		*(1.88)*
ChairmanBoard		0.0009		0.0003		0.0007		0.0003
		(1.48)		*(1.03)*		*(1.36)*		*(1.22)*
Director		0.0006		-0.0001		0.0005		0.0000
		(1.60)		*(-0.28)*		*(1.65)*		*(0.15)*
MultipleInsiders		0.0011		-0.0004		0.0011		-0.0004
		(4.33)		*(-3.38)*		*(4.89)*		*(-4.10)*
SOX		0.0041		0.0006		0.0036		0.0006
		(4.44)		*(1.14)*		*(4.52)*		*(1.33)*
Observations	147,357	136,404	325,645	307,905	147,357	136,404	325,645	307,905
Adjusted R^2	0.000	0.009	0.000	0.002	0.000	0.009	0.000	0.003
Year dummies	No	Yes	No	Yes	No	Yes	No	Yes
Industry dummies	No	Yes	No	Yes	No	Yes	No	Yes

Table 5.10: Univariate comparisons of stealth trading characteristics before and after SOX

This table displays mean and median Timespan, Number of transactions, aggregated Volume, aggregated Stake, average Volume, and average Stake of stealth trades for two legal regimes. Trades are defined as stealth if the last trade in a series of trades occurs before the first trade has been disclosed (or maximum 40 days after the first trade). For each variable, the table displays in parentheses, the p-value of the two-sided t-test on the equality of means and the p-value of the Wilcoxon rank-sum test.

	N	Mean	Median	Standard deviation	T-test	Wilcoxon test
Timespan between first and last trade (in days)						
Period up to August 28, 2002	120,530	8.14	4.000	9.938		
Period after August 28, 2002	109,693	1.33	0.000	3.408	(0.0%)	(0.0%)
Number of days between stealth trades of one series						
Period up to August 28, 2002	516,045	1.89	0.000	4.371		
Period after August 28, 2002	866,020	0.17	0.000	1.093	(0.0%)	(0.0%)
Number of transactions (in a series)						
Period up to August 28, 2002	120,530	5.29	3.000	10.312		
Period after August 28, 2002	109,693	8.88	3.000	24.991	(0.0%)	(0.0%)
Aggregated Volume in thousand $ (of all trades in one series)						
Period up to August 28, 2002	120,530	2,353	263.0	25,185		
Period after August 28, 2002	109,693	1,439	259.8	8,055	(0.0%)	(26.3%)
Average Volume in thousand $ (per individual trade)						
Period up to August 28, 2002	120,530	445	49.7	4,759		
Period after August 28, 2002	109,693	162	29.2	907	(0.0%)	(0.0%)
Aggregated Stake (of all trades in one series)						
Period up to August 28, 2002	120,530	0.29%	0.07%	0.96%		
Period after August 28, 2002	109,693	0.14%	0.04%	0.64%	(0.0%)	(0.0%)
Average Stake (per individual trade)						
Period up to August 28, 2002	120,530	0.05%	0.013%	0.181%		
Period after August 28, 2002	109,693	0.02%	0.004%	0.072%	(0.0%)	(0.0%)

Table 5.11: Price impact of insider transactions and stealth trading

This table presents results for OLS regressions with abnormal price impact of insider transactions as dependent variable (InsiderImpactPurchases and InsiderImpactSales). See Table 5.1 for a definition of all variables. For each independent variable, the table displays the slope estimate and, in parentheses, the p-value of the two-sided t-test for zero slope. In all OLS regressions, t-statistics are based on heteroscedasticity-consistent standard errors.

	Purchases		Sales		Purchases		Sales	
	OLS				OLS (Winsorized 1%)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Stealth	-0.0837	-0.0810	0.0206	0.0199	-0.0165	-0.0139	0.0043	0.0049
	(-62.04)	*(-49.39)*	*(38.35)*	*(35.34)*	*(-43.33)*	*(-32.05)*	*(26.62)*	*(29.66)*
LogMarketCap		-0.0268		0.0071		-0.0032		0.0011
		(-41.53)		*(27.02)*		*(-21.90)*		*(16.57)*
StakeDecile		-0.0006		-0.0011		-0.0006		-0.0007
		(-1.37)		*(-6.22)*		*(-6.33)*		*(-15.92)*
Turnover		-0.0008		0.3971		0.1800		0.0875
		(-0.02)		*(5.41)*		*(8.36)*		*(7.67)*
Volatility		-0.0443		0.0082		-0.0138		0.0021
		(-14.35)		*(3.70)*		*(-16.77)*		*(3.10)*
CEO		-0.0043		-0.0008		-0.0003		-0.0006
		(-1.36)		*(-0.77)*		*(-0.35)*		*(-1.66)*
Officer		-0.0023		0.0019		0.0012		0.0007
		(-0.91)		*(2.32)*		*(2.01)*		*(2.43)*
ChairmanBoard		-0.0021		0.0000		-0.0030		-0.0012
		(-0.52)		*(-0.02)*		*(-2.87)*		*(-2.92)*
Director		-0.0039		-0.0006		-0.0031		-0.0013
		(-1.72)		*(-0.71)*		*(-5.32)*		*(-4.86)*
MultipleInsiders		-0.0180		0.0001		-0.0011		0.0014
		(-10.42)		*(0.18)*		*(-2.49)*		*(7.51)*
SOX		0.0000		-0.0064		0.0005		-0.0007
		(-0.01)		*(-3.01)*		*(0.37)*		*(-1.07)*
Observations	147,357	136,404	325,645	307,905	147,357	136,404	325,645	307,905
Adjusted R^2	0.017	0.055	0.005	0.070	0.012	0.030	0.002	0.040
Year dummies	No	Yes	No	Yes	No	Yes	No	Yes
Industry dummies	No	Yes	No	Yes	No	Yes	No	Yes

Table 5.12: Abnormal outsider returns and stealth trading

The table presents results for OLS regressions with abnormal outsider returns CAR(1,20) as dependent variable. The event window starts (t=1) the next trading day after the disclosure date (t=0) of the first transaction of a series of stealth trades or the disclosure date of a non-stealth trade. See Table 5.1 for a definition of all variables. For each independent variable, the table displays the slope estimate and, in parentheses, the p-value of the two-sided t-test for zero slope. In all OLS regressions, t-statistics are based on heteroscedasticity-consistent standard errors.

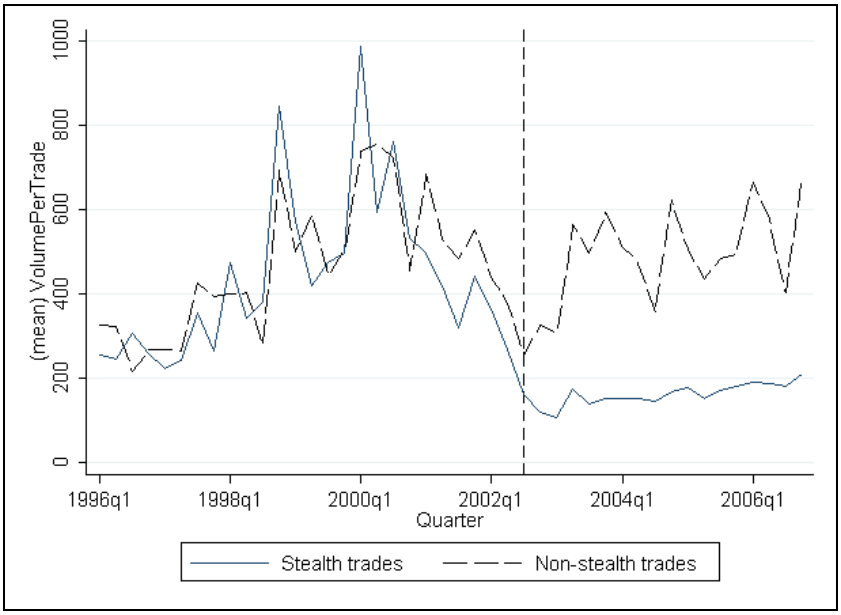
	Purchases		Sales		Purchases		Sales	
	OLS				OLS (Winsorized 1%)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Stealth	0.0141	0.0011	-0.0075	0.0012	0.0127	0.0006	-0.0074	0.0006
	(14.61)	*(1.06)*	*(-14.34)*	*(2.15)*	*(14.92)*	*(0.58)*	*(-15.95)*	*(1.16)*
LogMarketCap		-0.0047		-0.0045		-0.0039		-0.0034
		(-14.13)		*(-21.70)*		*(-13.12)*		*(-19.68)*
StakeDecile		0.0030		-0.0027		0.0031		-0.0024
		(13.26)		*(-21.51)*		*(15.18)*		*(-20.89)*
Turnover		0.0592		-0.0747		0.0525		-0.0622
		(2.01)		*(-10.31)*		*(2.05)*		*(-8.71)*
Volatility		0.0241		-0.0375		0.0182		-0.0388
		(8.87)		*(-17.79)*		*(8.67)*		*(-26.26)*
CEO		0.0097		-0.0040		0.0090		-0.0034
		(5.09)		*(-3.65)*		*(5.45)*		*(-3.52)*
Officer		0.0131		-0.0038		0.0129		-0.0036
		(9.29)		*(-4.78)*		*(10.20)*		*(-5.03)*
ChairmanBoard		0.0021		0.0056		0.0026		0.0048
		(0.86)		*(4.56)*		*(1.21)*		*(4.40)*
Director		0.0072		-0.0012		0.0066		-0.0010
		(5.26)		*(-1.49)*		*(5.36)*		*(-1.41)*
MultipleInsiders		0.0099		-0.0108		0.0098		-0.0099
		(10.08)		*(-19.33)*		*(11.05)*		*(-19.88)*
SOX		0.0371		0.0143		0.0328		0.0121
		(10.28)		*(6.60)*		*(10.46)*		*(6.16)*
Observations	147,357	136,404	325,645	307,905	147,357	136,404	325,645	307,905
Adjusted R^2	0.002	0.036	0.001	0.029	0.002	0.037	0.001	0.033
Year dummies	No	Yes	No	Yes	No	Yes	No	Yes
Industry dummies	No	Yes	No	Yes	No	Yes	No	Yes

10 Figures

Figure 5.1: Average volume of insider transactions

Panel A: Single stealth trades vs. non-stealth trades

The figure displays the development of the average volume (in thousand $) of single stealth trades and non-stealth transactions over the sample period. The dashed vertical line marks the quarter when the Sarbanes-Oxley act came into force.



Panel B: Aggregated stealth trades vs. non-stealth trades

The figure displays the development of the average volume (in thousand $) of non-stealth transactions and aggregated stealth trading sequences over the sample period. The dashed vertical line marks the quarter when the Sarbanes-Oxley act came into force.

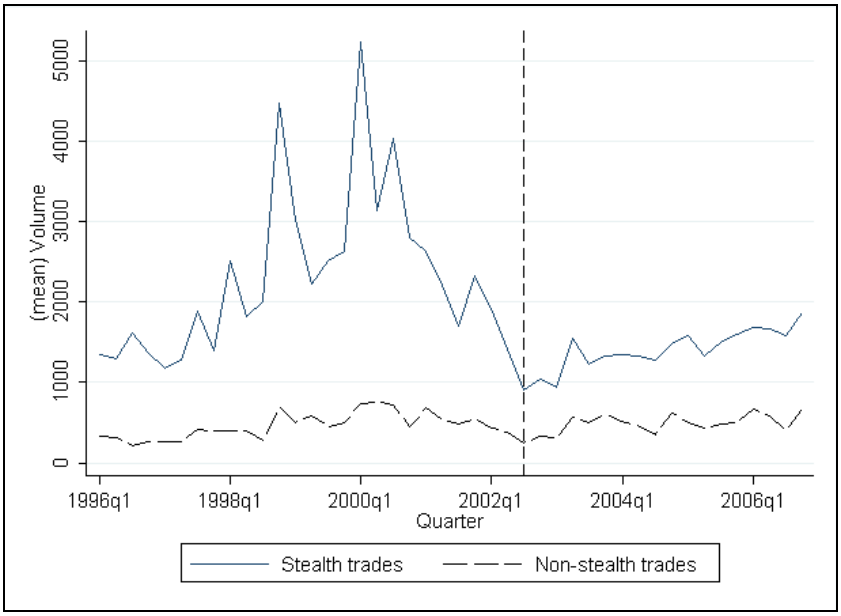
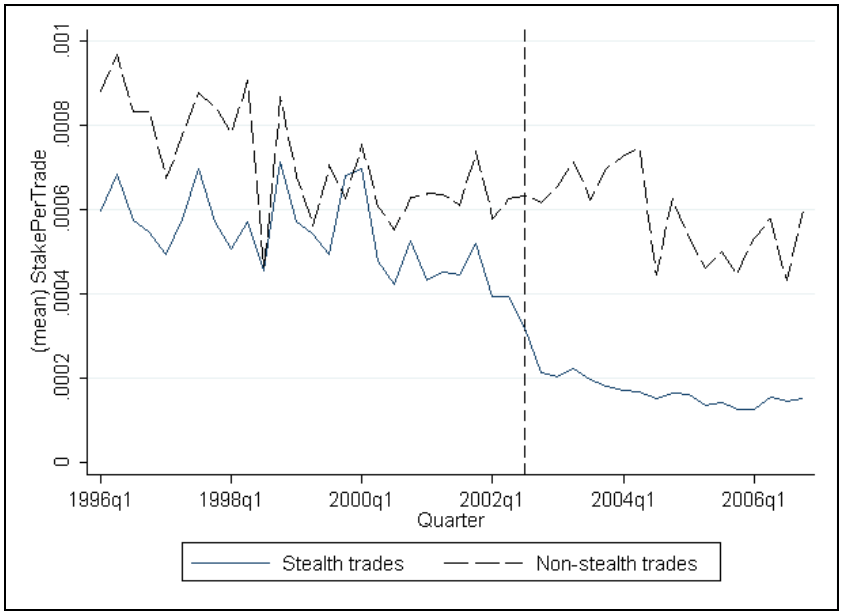


Figure 5.2: Average stake traded by insiders

Panel A: Single stealth vs. non-stealth trades

The figure displays the development of the average stake (= #shares traded / total #shares outstanding) traded in single stealth and non-stealth transactions over the sample period. The dashed vertical line marks the quarter when the Sarbanes-Oxley act came into force.



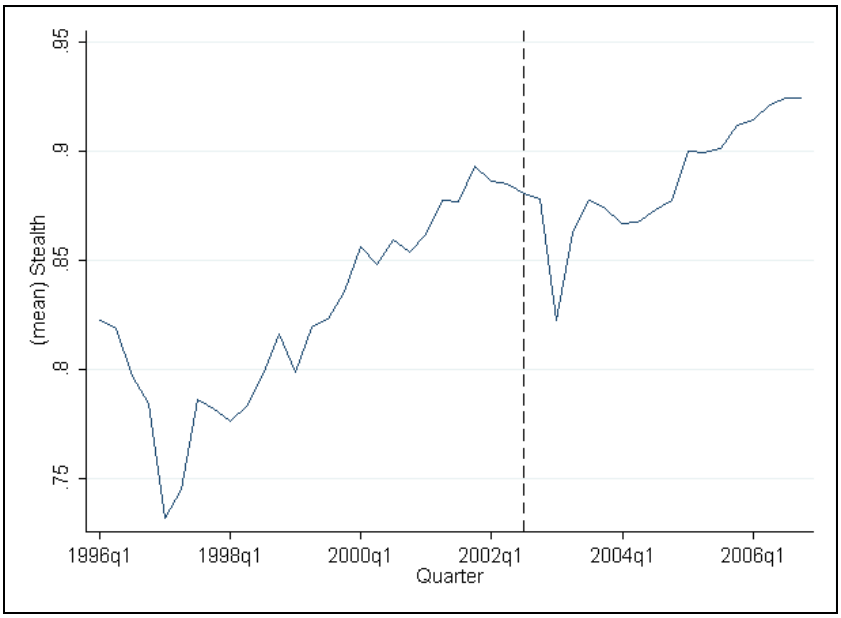
Panel B: Aggregated stealth vs. non-stealth trades

The figure displays the development of the average stake (= #shares traded / total #shares outstanding) of non-stealth transactions and aggregated stealth trading sequences over the sample period. The dashed vertical line marks the quarter when the Sarbanes-Oxley act came into force.

Figure 5.3: Proportion of stealth trades of all insider transactions

Panel A: Number of trades

The figure displays the development of the proportion of stealth trades of all insider transactions over the sample period. The dashed vertical line marks the quarter when the Sarbanes-Oxley act came into force.



Panel B: Volume and Stake

The figure displays the development of the total volume (in U.S. $) of stealth trades relative to the total volume of all insider transactions (*StealthVolume*) and total stakes traded (% of shares outstanding) in stealth trades relative to the total stakes traded in all insider transactions (*StealthStake*) over the sample period. The dashed vertical line marks the quarter when the Sarbanes-Oxley act came into force.

Figure 5.4: Average time span of a stealth trading sequence

The figure displays the development of the average time span between the first and the last trade in stealth trading sequence over the sample period. The dashed vertical line marks the quarter when the Sarbanes-Oxley act came into force.

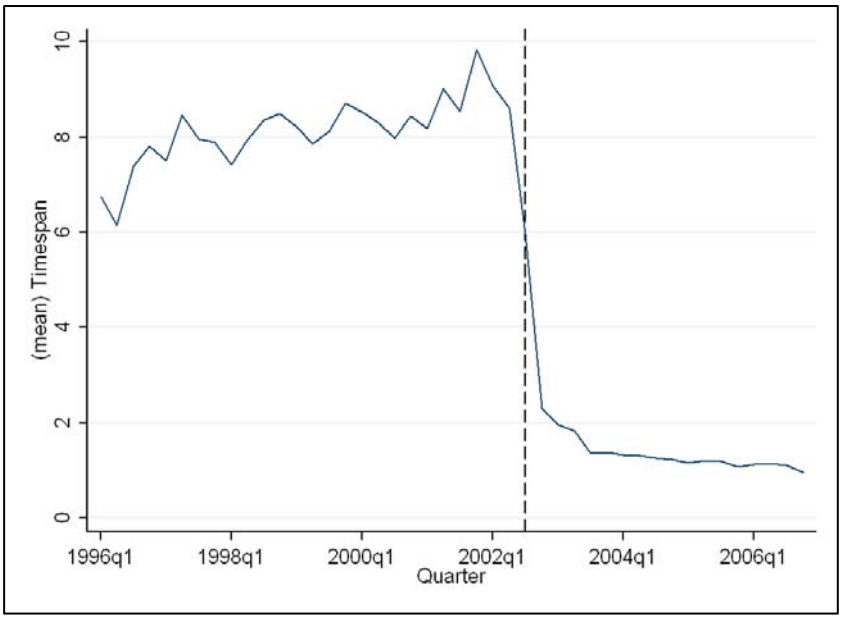


Figure 5.5: Average time span between two consecutive trades in a stealth trading sequence

The figure displays the development of the average number of days between the single trades in a stealth trading sequence over the sample period. The dashed vertical line marks the quarter when the Sarbanes-Oxley act came into force.

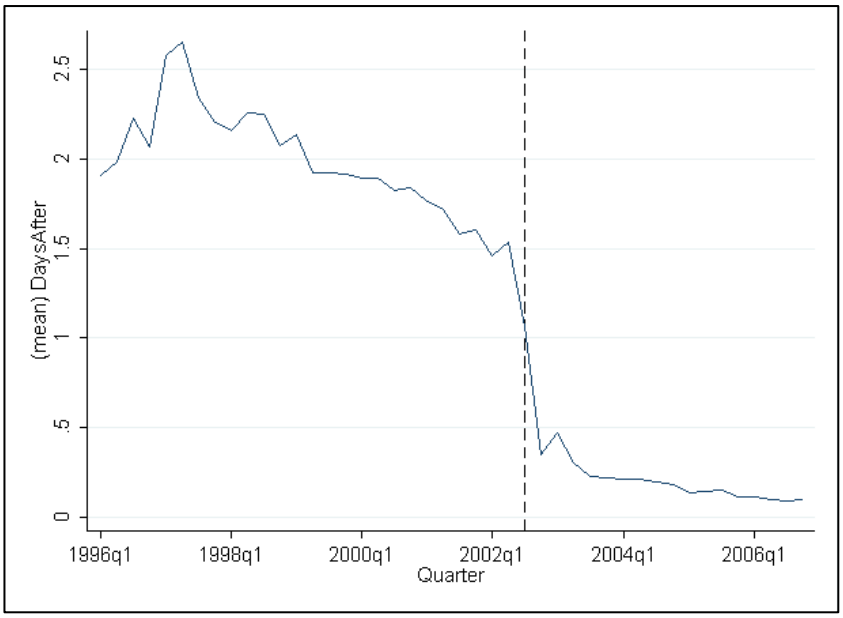


Figure 5.6: Average number of transactions in a stealth trading sequence

The figure displays the development of the average number of transactions in a stealth trading sequence over the sample period. The dashed vertical line marks the quarter when the Sarbanes-Oxley act came into force.

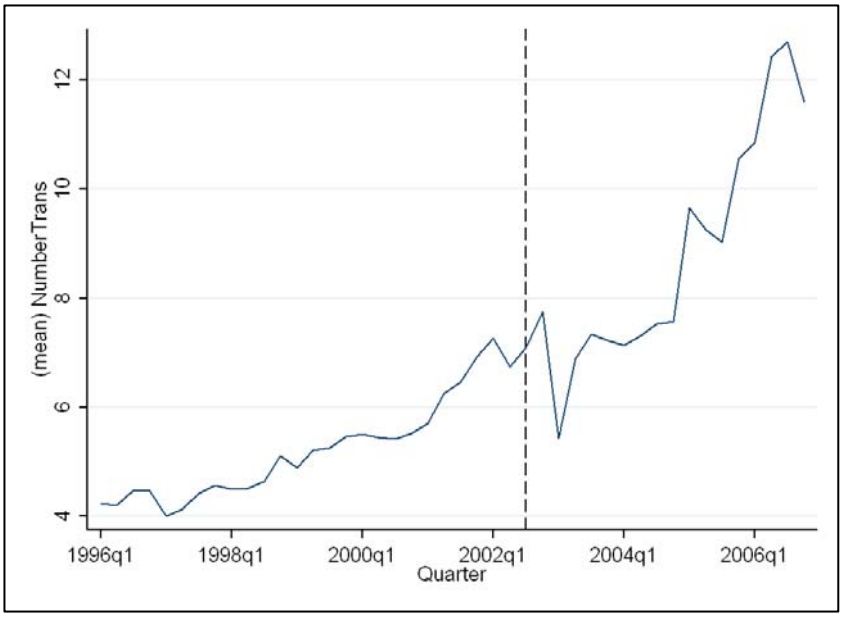


Figure 5.7: Average reporting delay of insider transactions

The figure displays the development of the average number of days between the trading and the reporting date for non-stealth and stealth transactions over the sample period. The dashed vertical line marks the quarter when the Sarbanes-Oxley act came into force.

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