Corporate Governance and Firm Performance: Evidence from Germany

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Abstract

Recent empirical work shows evidence of higher valuation of firms in countries with a better legal environment. We investigate whether differences in the quality of firm-level corporate governance also help to explain firm performance in a cross-section of companies within a single jurisdiction. Constructing a broad corporate governance rating (CGR) for German public firms, we document a positive relationship between governance practices and firm valuation. There is also evidence that expected stock returns are negatively correlated with firm-level corporate governance, if dividend yields are used as proxies for the cost of capital. An investment strategy that bought high-CGR firms and shorted low-CGR firms earned abnormal returns of around 12 percent on an annual basis during the sample period.

JEL Classification: G12, G34, G38.

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1. Introduction

In the past few years, corporate governance has become a popular area of discussion throughout Europe and, increasingly, also in Germany. Corporate Governance has been a topic of academic research for a long time in the Anglo-Saxon literature, but it has only recently moved from a special interest into all areas of the corporate sector and the political scene. In Germany, the recent publication of the "German Corporate Governance Code" (GCGC) for publicly listed companies has further intensified the discussion. In fact, one can identify three principal drivers for an increased demand for good corporate governance in Germany. First, the institutionalization of shareholdings, i.e., the process of accumulation and managing of capital by professional asset gatherers, is a worldwide trend. Institutional investors are important as providers of capital and put pressure on publicly listed companies by either selling shares of those firms that do not follow internationally recognized corporate governance standards ("Wall Street Walk") or by exercising direct control over the incumbent management of the respective firms ("Voice"). While institutional investors in Germany have been rather passive in the past in exercising their control rights, they are becoming more and more active. Second, although economies are becoming increasingly global, firms with international operations are still subject to national corporate governance from a judicial perspective. Notwithstanding country-specific legal frameworks, German firms need to adopt internationally recognized corporate governance principles in order to compete efficiently with their peers for capital in the global equity markets. This leads to a convergence of corporate governance principles and practices. Specifically, continental European governance systems have already converged in several areas toward the Anglo-Saxon model, which among institutional investors is widely regarded as the role model. Finally, the prominent examples of recent corporate collapses and the fall of 'Neuer Market' – the German equivalent to U.S. NASDAQ – give

reasons to believe that a firm's valuation does not only depend on the profitability or the growth prospects embedded in its business model, but also on the effectiveness of control mechanisms, which ensure that investors' funds are not expropriated or wasted in value-decreasing projects.

Increased shareholder activism, tightened rules and regulation, and additional self-regulation on behalf of market participants are the result of the conviction that better corporate governance will deliver higher shareholder value. This notion is supported by a recent strand of the empirical literature. Using firm-level data from 27 developed countries, La Porta, Lopez-de-Silanes, Shleifer, and Vishny (LLSV, 2002) find that better shareholder protection is associated with higher valuation of corporate assets. Similarly, Gompers, Ishii, and Metrick (2003) report for a broad sample of US firms that firms with stronger shareholder rights receive higher valuations and have higher profits, higher sales growth, and lower capital expenditures. Klapper and Love (2003) use firm-level data from 14 emerging stock markets and also report that better corporate governance is highly correlated with better operating performance and higher market valuation. Finally, Black, Jang, and Kim (2003) find that corporate governance is important for explaining the market value of a complete set of Korean public companies. Their results also shed some light on endogeneity, an issue that plagues virtually all empirical studies in the field. They show that even moderate increases in the quality of firm-specific corporate governance *cause* substantial increases in Tobin's Q and the market-to-book ratio.

The principal-agent theory is generally considered as the starting point for any discussion on corporate governance. It is important to note that agency problems may have two effects on a firm's stock price: they can influence (i) expected cash flows accruing to investors and (ii) the cost of capital. First, agency problems may lead to low stock price multiples as investors an-

ticipate that cash flows will be diverted. The model in LLSV (2002) predicts that investors pay more because they recognize that, "with better legal protection, more of the firm's profits would come back to them as interest or dividends as opposed to being expropriated by the entrepreneur who controls the firm."[5] In addition, because diversion is costly, higher cash flow ownership should lead to higher incentives, lower expropriation and, hence, higher valuations. LLSV (2002) interpret the empirical results as being consistent with their model, although their data do not provide direct evidence of how expropriation works. Second, good corporate governance may reduce the expected return on equity to the extent that it reduces shareholders' monitoring and auditing costs. Lombardo and Pagano (2002) extend the traditional Capital Asset Pricing Model (CAPM) to include compensation for the expected costs induced by the agency relationship between insiders and outside shareholders. Unfortunately, the translation of differences in the quality of corporate governance into expected rates of return (1) across countries and (2) across firms within a single jurisdiction is notoriously difficult to measure empirically.[6] In fact, the empirical results in Lombardo and Pagano (2000) are somewhat hard to interpret. They document that the cost of capital (if measured with either the dividend yield or the earnings-price ratio) is negatively related with measures of protection of shareholder rights, but it is positively related with general measures of the quality of legal institutions.

Most empirical studies analyze the impact of different corporate governance practices in a cross-section of countries. The primary objective in this paper is to provide evidence for a possible relationship between corporate governance and firm performance *within* a single jurisdiction. Rather than looking at the regulatory environment or ownership structure, which

5 See LaPorta, Lopez-de-Silanes, Shleifer, and Vishny (2002), p. 1147. See also the theoretical model in Shleifer and Wolfenzon (2003).

affects all firms similarly within a country, we specifically focus on the relationship between a large set of governance proxies and firm performance in a representative cross-section of German publicly listed firms. This question is particularly important when individual firms can change their own governance practices (but not their country's rules) and must decide on an optimal set of rules. Interestingly, using a sample of emerging stock markets, Klapper and Love (2003) find that firm-level corporate governance provisions matter more in countries with weak legal environments. They conclude that firms have limited flexibility to affect their governance and, hence, improving the country-level efficiency of the legal system within a country is likely to lead to an increase in the average firm-level governance. Therefore, taking into account that Germany is a well-developed stock market, it is ex ante unclear whether or not we will be able to identify the presumed relationship between corporate governance and firm performance in our sample of German firms. As will be discussed in more detail below, the (not legally required) recommendations of the GCGC provide a natural starting point for our analysis.

Apart from using a cross-section of countries, most studies focus on the efficiency of a country's legal system. This is not surprising, given that the majority of research reflects an Anglo-Saxon approach to corporate governance, which strongly emphasizes the importance of rules and the quality of their enforcement. In the United States, with traditionally high dispersion of ownership, the primary methods to solve agency problems are the legal protection of minority investors, the use of boards as monitors of senior management, and an active market for corporate control. In contrast, German corporate governance is characterized by lesser reliance on capital markets and outside investors, but a stronger reliance on large inside investors and financial institutions to achieve efficiency in the corporate sector. In this case, out-

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6 See Henry (2000) and Bekaert and Harvey (2003).

side (smaller) investors face the risk of expropriation in the form of wealth transfers to larger shareholders. Consequently, most of the existing German research focuses on the relationship between ownership structure and firm performance. However, the results of empirical studies diverge substantially and depend strongly on the sample of firms, the sample period, and the methodology used. For example, Lehmann and Weigand (2000) find that for listed and non-listed firms ownership concentration affects profitability significantly negatively, while bank ownership improves performance. In contrast, Boehmer (2000) analyzes the effect of bank influence on the net present value of major investment decision and finds that a majority control by banks is detrimental to shareholders. Boehmer (1999) and Hellwig (1991, 1997) provide a detailed analysis of the benefits and costs of the German system. At this point it seems sufficient to refer to the characterization of corporate governance in the GCGC itself, whose proposition is to "promote the trust of international and national investors, customers, employees and the general public in the management and supervision of listed German stock corporations."[7] This is in contrast to the Anglo-Saxon view of corporate governance, where there is little room for the general public. For example, Shleifer and Vishny (1997) merely refer to "the risk which financiers face in assuring that their funds are not expropriated or wasted in value-diminishing projects." Similarly, La Porta, Lopez-de-Silanes, Shleifer and Vishny (2000) define corporate governance as "a set of mechanisms through which outside investors protect themselves against expropriation by the insiders". Given this peculiar institutional environment , analyzing the relationship between governance and firm performance for a sample of German public companies is an important contribution to the literature.

Apart from the different institutional background of the German market, our approach follows Black, Jang, and Kim (2003), who construct a governance rating for Korean companies based

7 See the German Corporate Governance Code (2002), www.corporate-governance-code.de.

on survey data.[8] Similarly, to measure the relationship between corporate governance and firm performance, we develop a broad corporate governance rating (CGR) as a proxy for firm-level governance quality. To this end, a detailed questionnaire with a variety of different governance practices and attitudes was sent out to all firms in the four principal segments of the German stock exchange. The survey is based on the recommendations of the GCGC, which are to a large extent voluntary and can be initiated and implemented by a firm's decision makers. This approach reflects the view that corporate governance should be understood as a chance rather than an obligation. For each company, we aggregate the answers to obtain a broad measure of firm-specific corporate governance. Our results for 91 German firms show that better corporate governance is highly correlated with better operating performance, higher stock returns, and higher market valuation.

The remainder is as follows. Section 2 describes the construction principles of our corporate governance rating and provides a description of the data. Section 3 explores the relationship between corporate governance and stock returns, and section 4 presents the results for the relationship between corporate governance and firm valuation. Section 5 concludes.

2. Data

2.1. Constructing a German corporate governance score

We use a broad, multifactor corporate governance rating (CGR), which is based on responses to objective survey questions. To qualify for an inclusion into the rating, each practice and attitude (i) must refer to a governance element that is not (yet) legally required and (ii) needs to be considered as international market practice from an investor's perspective. A useful

8 Gompers, Ishii, and Metrick (2003) also construct a governance index, but they focus on governance provisions which are primarily related to takeover defenses.

source to identify relevant governance proxies is the list of recommendations and suggestions contained in the GCGC. The GCGC presents compulsory statutory regulations as well as recommendations and suggestions with respect to 'good' and 'responsible' corporate governance for the management and supervision of German listed companies. The code is an example of self-commitment by the corporate sector and, as a soft-law, supplements the "comply-or-explain" rule in the Transparency and Disclosure Law (TransPuG), which recently entered into effect. If firms deviate from recommendations, they must disclose it in their annual financial statements and explain their decisions to the investment public. This enables companies to reflect sector- and firm-specific requirements and contributes to more flexibility and self-regulation in the German corporate constitution. It also reflects the common belief that implementing adequate governance structures should be understood as a chance, as opposed to an obligation, by corporate decision makers. In contrast, firms can deviate from suggestions without disclosing their decisions. Accordingly, most proxies included in our corporate governance rating (CGR) represent recommendations of the GCGC.[9] The other governance proxies we use have been gathered from the DVFA German Corporate Governance Scorecard[10], from CalPERS German Market Principles, and from the Deminor Corporate Governance Checklist. The complete set of proxies has been tested on plausibility from a legal and regulatory perspective by Deutsche Börse AG.[11]

In total, we collect 30 governance proxies divided into five categories: (1) corporate governance commitment, (2) shareholder rights, (3) transparency, (4) management and supervisory

9 Only a few recommendations, e.g., those related to specific management and supervisory board matters, have been disregarded in the questionnaire. We anticipated that the response rate would be rather low, because the recipients of the questionnaire would be unwilling to respond for confidentiality reasons.

10 DVFA is the German Society of Investment Analysis and Asset Management.

board matters, and (5) auditing. A detailed questionnaire with all thirty governance proxies was sent out to all firms in the four principal market segments of the German stock exchange: DAX 30 (blue-chip stocks), MDAX (mid-cap stocks), NEMAX 50 (index of growth firms), and SMAX (small-cap stocks), comprising a total of 253 firms.[12] A sample of representative questions is listed below:

- Are there firm-specific corporate governance guidelines set out in writing?
- Are there measures in place to facilitate the personal exercising of shareholder voting rights (e.g., via internet) and to assist the shareholders in the use of proxies?
- Are the fixed and variable remuneration elements as well as share ownership (including existing option rights) of members of the management and supervisory board published separately and in individualized form in the notes to the financial statements?
- Are there supervisory board committees to deal with complex matters (e.g., audit, compensation, strategy)?
- Are there firm-specific rules to ensure that the auditor does not perform other services for the firm (e.g., consulting work)?

The survey was supplemented by verification of the collected data on the basis of annual and quarterly reports, company charters, and web pages, where necessary. The questionnaire was sent out in February 2002, and the data collection was completed at the end of March 2002. Overall, the survey had a response ratio of 36 percent, which results in a sample of 91 German firms.[13] Panel A in table 1 shows the break-down of the response ratios by market segments.

The construction principles of the aggregate governance rating are straightforward. First, the distinction in the governance quality to derive the rating is clear in almost all cases. Gener-

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11 The questions have also been checked by Credit Suisse First Boston from an institutional investor's perspective to ensure that they reflect the overall market opinion.

12 The growth segment was established as 'Neuer Markt', the German equivalent to NASDAQ. The NEMAX 50 index contains the largest firms listed on Neuer Markt.

ally, a higher acceptance level of a proxy variable indicates an active move by the firm's management to have improved its governance system. Second, 25 basis points are added for each acceptance level of the respective proxy in a five-scale answering range. Higher acceptance levels can be interpreted as better firm-specific governance. Finally, for each firm the aggregate rating is an unweighted sum of the basis points across all proxies, ranging from 0 (minimum) to 30 (maximum).

Figure 1 shows the resulting distribution of our corporate governance rating. To simplify, the ratings have been rounded to the nearest integer. The histogram shows that the rating over the 91 firms in our sample is slightly skewed to the left. More than 40% of the firms have a rating between 20 and 23. Nevertheless, the figure reveals that the governance proxies are adequately selected to reach a sufficiently wide distribution, which mitigates a possible selection bias in our survey. It should also be noted that an equal weighting scheme for the different proxies makes no attempt to accurately reflect the relative importance of individual governance practices, but it has the advantage of being transparent and allows easy interpretations. To assess whether an equal weighting scheme is appropriate, table 2 shows the correlation table for each subindex (i.e., the rating in the five governance categories in our survey). All correlations are positive, but in general not very high. This indicates that our weighting scheme avoids double-counting by assigning undue weights to some governance practices (while neglecting others), which would lead to biases in our aggregate rating. Only the correlation between the categories 'management and supervisory matters' and 'auditing' are above 0.5. This, however, should not impose a problem, because these two governance categories are hardly substitutes.

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13 We think that this is a relatively high value. In their recent survey on corporate finance practices, Graham and Harvey (2000) had a response rate of 9%, resulting in a sample of 392 firms.

Panel B in table 1 reports the summary statistics of our governance rating by the four principal market segments of the German stock exchange. Obviously, DAX 30 firms exhibit the highest ratings, followed by NEMAX 50, MDAX, and SMAX firms. The leading position of DAX 30 blue-chip firms is not surprising, because they face the strongest investor pressure. In addition, the high governance ratings of NEMAX 50 firms relative to the other market segments can be rationalized in the context of more stringent regulation at Neuer Markt.[14] While SMAX firms must adhere to certain disclosure and auditing obligations, they are rather reluctant to adopt governance standards going beyond regulation. Generally, this is due to the costs involved and less pronounced investor pressure.

Table 3 shows the rating of governance proxies by the five categories. The numbers indicate the percentages of firms with maximum ratings in each category. Governance proxies related to the firms' transparency and auditing standards receive the highest ratings, while those related to general governance commitment and board matters exhibit the lowest ratings. This is probably because disclosure and auditing standards are easier to implement and enforce from a regulatory perspective. Finally, particularly board structures lack Anglo-Saxon governance character due to the German co-determination regime and cross-shareholder representation.

Table 4 shows that the governance ratings also vary significantly across different industries. The industry classification is borrowed from Dow Jones EURO STOXX. Disregarding industries with only one firm in the sample, financials and healthcare and technology firms exhibit the highest average governance ratings. This contrasts with firms in the more domestically

14 Trading on Neuer Markt was not organized under public law like the trading on the Official Quotation (Amtlicher Handel) or on the Regulated Market (Geregelter Markt). Instead, it operated as an independent trading segment of the Frankfurt Stock Exchange. Trading was organized under private law. Admission to the Regulated Market was only one of the prerequisites which Neuer Markt applicants had to meet.

oriented sectors, such as industrials. The latter sector includes firms in the construction business, which have particularly low governance ratings. The higher governance ratings of certain industries can be rationalized, among others, through the need to access the capital markets more frequently or even an existing listing in an Anglo-Saxon country.

2.2. Univariate analysis

To investigate the relationship between corporate governance and expected stock returns, we use two different measures: (i) historical returns (RI) and (2) dividend yields (D/P). Specifically, we draw the monthly returns of all firms over the period from January 1, 1998 to March 1, 2002 (50 months) and calculate their monthly geometric mean returns. Note that some firms have only gone public during the sample period. In these cases, we use the available data since the first month of trading. We also gather dividend yields, based on an anticipated annual dividend (excluding special or once-off dividends).[15] To avoid potential biases, we use an average of monthly dividend yields over the sample period. We only include dividend-paying firms in our regression framework. Since many of the newly listed firm have not paid any dividend to date, this reduces the sample size in the regressions including the dividend yield as the dependent variable from 91 to 71 firms. Summary statistics are shown in column 1 in table 5.

In a next step, to explore the relationship between corporate governance and firm valuation, we use two valuation measures: (i) Tobin's Q and the (ii) market-to-book ratio (MTBV). Tobin's Q is defined as the market value of assets (calculated as book value of assets minus book value of equity plus market value of equity) over book value of assets, and the market-to-book ratio is calculated as market value of equity over book value of equity. All values are

taken as of end 2001.[16] As shown in table 5, the average Tobin's Q is 1.63, and the average market-to-book ratio is 3.76. The maximum Tobin's Q is 8.01, and all market-to-book ratios are generally below 15. There is only one firm with a market-to-book ratio slightly above 20; all our results are robust to an exclusion of this firm from the sample.

Column 2 in table 5 shows the correlation coefficients between our governance rating and the variables just introduced. We also collect two additional variables; the variable labeled MV denotes the simple average monthly market capitalization, and GROWTH is a proxy for expected future growth. Specifically, expected growth rates are calculated as the mean of historical growth rates and expected earnings per share growth rates. In this way, historical growth is updated with expected earnings growth, which has itself a forward-looking character. Historical growth rates are an average of sales growth and asset growth over the sample period. Expected earnings per share growth rates are derived from IBES expected forward year earnings per share divided by the IBES expected current year earnings per share.[17] Evidently, for all measures except GROWTH, the correlation coefficients with our corporate governance rating are statistically significant. Specifically, firms with better governance practices tend to be large, have higher average returns and lower dividend yields, and generally receive higher valuations, as measured by Tobin's Q and the market-to-book ratio.

Following Gompers, Ishii and Metrick (2003), we pay special attention to two portfolios. First, the "principal portfolio" consists of all firms with the highest governance quality, with CGR > 21. Second, firms with the weakest governance quality, with CGR < 18, are placed

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15 Datastream datatype: DY.

16 Alternatively, we also experimented with averages of year-end values of Tobin's Q and MTBV over the sample period as dependent variables. However, all our results reported below do not change qualitatively.

into an "agent portfolio". The principal portfolio contains 30 and the agent portfolio 31 firms, i.e., ranking firms according to their governance ratings, both portfolios roughly represent the upper and lower third of our sample. The portfolio returns are all equally-weighted. Columns 3 and 4 in table 5 show the means for the respective variables within the principal portfolio and the agent portfolio, respectively. Finally, column 5 shows the differences in the means of all variables between the two portfolios. As could be expected, there are several marked differences. With respect to past returns, we find that the firms in the principal portfolio had on average 2.3 percent higher monthly returns than the firms in the agency portfolio. Firms in the principal portfolio are also much larger and exhibit significantly lower dividend yields. Finally, firms in the principal portfolio have higher values of Tobin's Q, higher market-to-book ratios, and higher expected growth rates compared to firms in the agent portfolio, albeit the differences in means are not significant.[18] While these results from a univariate analysis support our general notion, a multivariate regression framework is clearly needed to control for financial risk and/or growth characteristics, before one can draw firm conclusions.

3 Corporate governance and stock returns

3.1 Time series analysis

If corporate governance matters for firm performance (and if this relationship is fully incorporated by the market), stock prices should quickly adjust to any changes in firm-specific governance practices. This is the central notion of event studies, in which case expected stock

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17 Datastream datatypes: EPS2 divided by EPS1. Because we excluded firms with growth rates in excess of ±50%, the sample size in the regressions including GROWTH is reduced to 83 firms.

18 When we only look at historical growth rates (instead of the average of historical growth and expected future earnings growth), the mean difference between the firms in the two portfolios increases to 5 percent, but it is still insignificant. However, this larger difference is important for our interpretations in section 3.3 below.

returns would be unaffected beyond the event window and we would not see much of a difference in return. However, if governance matters, but is not incorporated immediately into stock prices, realized returns should differ systematically. In this section, we analyze whether such systematic differences exist.

As shown above, the mean returns of the agent portfolio (with CGR < 18) and the principal (with CGR > 21) portfolio are different at the 5% level of significance. We now calculate buy-and-hold returns for the two portfolios over the sample period. If an investor had put 1 Euro into the agency portfolio on January 1, 1998 (beginning of the sample period), it would have diminished to 88 cents by March 1, 2002 (end of sample period). In contrast, an investment of 1 Euro in the principal portfolio would have grown to 1.41 Euro over the same time period. This equals to an annualized return of -3.1 percent for the agency portfolio and 8.6 percent for the principal portfolio, a difference of roughly 12 percent per year. Note that all portfolio returns are equally weighted. Figure 2 displays the buy-and-hold returns for the two portfolios and compares them with the performance of the DAX 100 index over the sample period. It must be noted that our analysis is hampered by the fact that we have no time-varying governance ratings. Therefore, we implicitly assume a constant governance rating during the sample period. This assumption is not perfectly accurate, but we think not critical. Governance issues have received broader attention only recently and the public discussion has not reached its peak yet. This might ensure that the relative importance of governance remains unchanged across firms during the sample period.

Looking at figure 2, the strong outperformance of the principal portfolio over the period from January 1999 to April 2000 can partly be rationalized with hype valuations on Neuer Markt. Because the governance ratings of NEMAX 50 firms tend to be high due to the more stringent

regulation, as illustrated in table 1, several of these firms entered into the principal portfolio. To avoid any biases, we exclude the NEMAX 50 firms from the principal portfolio and re-compute the return spread between the two portfolios. Figure 2 shows that even an 'adjusted' principal portfolio outperformed the agent portfolio and (albeit only by a small difference) the DAX 100 market index. However, the annualized return difference between the two portfolios shrinks from 12 percent to 8 percent. Interestingly, the outperformance of the adjusted principal portfolio even persisted in sharp bear market periods, such as between August and October 1998 (Russian crisis) as well as in periods of external shocks, such as after September 11, 2001.

It is obvious from figure 2 that the magnitude of buy-and-hold returns is determined by the chosen starting point as well as the length of the sample period. We think that a five year period is a reasonable compromise; it is sufficiently long to compute average returns and contains both a bull and a bear market. It is therefore instructive to calculate buy-and-hold returns during the two subperiods from 1998.01 to 2000.03 (bull market) and from 2000.04 to 2002.03 (bear market). Figure 3 shows that the principal portfolio has outperformed the agent portfolio during both subperiods. However, during the bear market in the second half of our sample a clear Neuer Markt effect can be observed, i.e., the principal portfolio significantly outperformed the agent portfolio only after excluding the NEMAX 50 firms. Interestingly, investors would have been better off holding the market index during the later bear market.

What can explain this disparity in performance? To answer this question, we explore whether a rational asset pricing model is able to capture the return differences. There is a large amount of empirical evidence that, in addition to market risk (beta), other firm characteristics, such as a firm's market capitalization (size), book-to-market characteristics (or other value

characteristics), or immediate past returns (momentum) provide significant explanatory power for the cross-section of expected returns.[19] If the agent portfolio differs significantly from the principal portfolio in these characteristics, this may explain at least part of the difference in raw returns. We apply the three-factor model originally proposed by Fama and French (1993). Specifically, to account for the differences in style or riskiness between the two portfolios, we estimate the following time series regression:

$$(1) \qquad PMA_t = \alpha + \beta_1 \cdot RMRF_t + \beta_2 \cdot SMB_t + \beta_3 \cdot HML_t + \varepsilon_t,$$

where PMA_t is the return difference between the principal and the agency portfolio in month t, $RMRF_t$ is the month t value-weighted market return minus the risk-free rate, and SMB_t (small minus big) and HML_t (high minus low) are the month t returns of factor mimicking portfolios designed to capture size and book-to-market characteristics, respectively. Although there is an ongoing debate about whether these factors are proxies for risk, we take no position on this issue and simply view the three-factor model as a method of performance attribution.[20] Thus, we interpret the estimated intercept coefficient, denoted as α, as the return in excess of what could have been achieved by passive investments in the factors. In other words, the intercept is the abnormal return on an investment strategy that buys the principal portfolio and sells short the agency portfolio.

Table 6 reports the regression results of the three-factor model in equation (1) over the sample period from January 1, 1998 to March 1, 2002 (50 months). The dependent variable is the monthly return difference between the principal portfolio and the agent portfolio, labeled as PMA (principal minus agent). The explanatory variables are RMRF, HML, and SMB.

19 See Cochrane (1999) for an overview.

20 See Daniel and Titman (1997) for an opposing view.

RMRF is the return on the DAX 100 market index in excess of the 10-year Bund yield. SMB constitutes the monthly return differences between the SDAX 100 and the DAX 30 market indices. HML denotes the monthly return differences between the MSCI value and growth indices for Germany. These indices use market-to-book value (MTBV) ratios to divide the standard MSCI country index for Germany into two subindices, value and growth. All securities are classified as either value securities (low MTBV) or growth securities (high MTBV), relative to the MSCI country index for Germany. The regression results show that the coefficients of RMRF and SMB enter with a positive and negative sign, respectively, and they are significant at the 1% and 5% level of significance.[21] The negative sign of SMB is consistent with our previous finding that high-CGR firms tend to be large firms. If RMRF, SMB, and HML stand for proxies of systematic risk factors, the return difference between the principal and the agency portfolios can partly be explained through market risk and a size effect. However, our estimate for the intercept is statistically significant at the five-percent level and amounts to 137 basis points per month, or 16.4 percent per year. This is similar in magnitude to the annualized abnormal return from the buy-and-hold strategy analyzed above. We conclude that the differences in returns cannot be attributed to differences in size or investment style.

3.2. Modeling corporate governance as a reward for risk

In this section, we start by using historical stock returns to measure the relationship between firm-level corporate governance and the expected rate of return on a stock. This implicitly assumes that historical returns are good proxies for expected rates of return. In the presence of agency costs, expected stock returns may include a risk component not related to the beta

21 This result is in line with the results in Gompers, Iishi, and Metrick (2003).

of a stock. Therefore, an interesting question is whether a variation in firm-specific governance practices can account for the cross-sectional differences in the expected rate of return. On the other hand, differences in governance practices may already be captured by a firm's beta factor. In fact, without agency costs, we assume that markets are efficient and the CAPM holds. In a world with agency cost, however, institutional issues may become important in determining the expected rate of return on equity. Lombardo and Pagano (2000) suggest that the expected rate of return should also compensate investors for expected monitoring, auditing, and other private costs associated with different corporate governance systems. In their model stronger protection of minority shareholders' property rights reduces the expected return on equity to the extent that it reduces the shareholders' monitoring and auditing costs. Similarly, Merton (1987) shows that the expected return on any given stock is higher the smaller the fraction of investors who are informed about the stock. Any institutional development that reduces the cost of obtaining reliable information about a firm's true state will reduce the rate of return required by investors.

The empirical methodology consists of two steps. First, to estimate firm betas, we run for each firm a time-series regression of monthly returns on the corresponding returns of the DAX 100 index over the 50 months sample period. Second, to investigate whether our governance rating has explanatory power that is not captured by the firms' market betas, we estimate the following cross-sectional regression:

$$(2) \qquad \bar{\mathbf{r}} = \gamma_0 \cdot \mathbf{1} + \gamma_1 \cdot \mathbf{ß}_m + \gamma_2 \cdot \mathbf{CGR} + \mathbf{e},$$

where $\bar{\mathbf{r}}$ is the n×1 vector of monthly geometric *average* excess returns during the sample period, $\mathbf{1}$ is an n×1 vector of ones, $\mathbf{ß}_m$ is the n×1 vector of estimated betas from the first-pass regression, and **CGR** is the n×1 vector with elements corresponding to the corporate govern-

ance rating. Finally, n denotes the sample size and **e** is white noise. Note that the setup in equation (2) is a simplified version of the Fama and MacBeth (1973) approach, but we only look at a single cross-section of average historical stock returns. This approach is standard in the asset pricing literature because it can easily accommodate any additional risk factor beyond systematic market risk. In our case, we are particularly interested in the explanatory power of our corporate governance rating as an additional variable. Specifically, the coefficient γ_2 can be regarded as a reward for risk related to firm-level governance quality. The null hypothesis is that $\gamma_0 = 0$ (zero intercept), $\gamma_1 > 0$ (positive market risk premium), and $\gamma_2 = 0$, i.e., firm-level governance has no explanatory power beyond beta.

We have argued that better corporate governance is associated with lower expected rates of return on equity. However, an ex ante prediction of the direction of the relationship between our governance rating and historical stock returns is ambiguous. In fact, since the cost of capital changes when firms adopt higher governance standards and this process is only gradual, it may be inappropriate to use average returns to measure changes in the cost of capital. The main problem is that complex timing effects arise, which are hard to capture empirically. Bekaert and Harvey (2000) argue that an improvement in governance practices and the different valuation it implies should have a discrete effect on the price level of stocks and, hence, exploiting information in price levels may be more powerful.[22] In fact, we argue that the relationship between average historical returns and our governance rating is likely to be positive. Firms with a high governance rating have improved their governance quality in the years prior

22 In fact, Bekaert and Harvey (2000) look at the effects of liberalizations of emerging stock markets on expected stock returns, but the argument applies in the same way. See also the discussion in Henry (2000) and Bekaert and Harvey (2003). Gompers, Ishii, and Metrick (2003) interpret this test as a “long-run event study”.

to data collection. By removing certain governance malfunctions, these firms are likely to exhibit better performance than their peers with worse governance practices.

Recognizing that historical returns may be a poor proxy for expected returns, we turn to simple fundamental ratios. From an accounting standpoint, a firm's profitability is often measured by fundamental ratios, e.g., the dividend yield. In equilibrium, this profitability equals the return which shareholders require to hold the shares of the company in their portfolio. Adjusting for differences in future growth, Errunza and Miller (1998), Lombardo and Pagano (2000) and Bekaert and Harvey (2000) use the dividend yield as a measure of the cost of capital. It has the advantage that it is directly observable and is a stationary variable. Most important, the dividend yield is intricately linked to the cost of equity capital in the standard textbook valuation model. Specifically, holding growth rates and payout ratios constant, high (low) dividend yield firms are associated with high (low) expected rates of returns.

Therefore, if in addition the required rate of return also depends on our survey-based governance rating, the augmented model for the cross-section of expected returns is as follows:

$$(3) \qquad \frac{\mathbf{D}}{\mathbf{P}} = \gamma_0 \cdot \mathbf{1} + \gamma_1 \cdot \mathbf{ß}_m + \gamma_2 \cdot \mathbf{CGR} + \gamma_3 \cdot \mathbf{GROWTH} + \mathbf{e},$$

where **D/P** denotes the vector of average dividend yields during the sample period from January 1, 1998 to March 1, 2002, and **GROWTH** is the vector with elements corresponding to our proxy for expected future growth (see section 2.2 for a description). We exclude non-dividend paying firms, which reduces our original sample to 71 firms. Clearly, the standard version of the CAPM again posits that $\gamma_2 = 0$, i.e., there is no systematic risk measure beyond market risk. However, we conjecture that $\gamma_2 < 0$, hence, companies with better firm-level governance (high CGR) exhibit lower dividend yields. In addition, while we expect that the

dividend yield is negatively correlated with future growth, we do not assume $\gamma_3 = -1$ to hold, unless the restrictive assumptions of the Gordon Growth Model would apply.[23]

3.3 Cross-sectional analysis

Panel A of table 7 shows the regression results with average historical returns as the dependent variable, as specified in equation (2). Interestingly, beta enters with a negative coefficient, which is not in line with the theoretical predictions. Irrespective of the direction, beta's overall explanatory power in column (1) is very low, with an R-square of 0.8 percent.[24] The specification in column (2) applies our corporate governance rating in a univariate regression. The coefficient on CGR is positive and significant at the 1 percent level. Finally, in column (3) we also control for systematic risk. The null hypothesis that $\gamma_2 = 0$ can be rejected at the 1 percent level of significance, indicating that firms with better governance practices experience higher stock returns. Note that this evidence is somewhat at odds with the intuition from agency theory, which predicts that the effect of better firm-level governance on the expected rate of return is negative, because it lowers the monitoring, auditing and other private costs of investors. One could think of two possible explanations for the positive relationship between our governance rating and total returns: (i) unexpected agency costs and (ii) closing the value gap.

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23 Clearly, this is unlikely, since (i) dividends are unlikely to be constant over time, as it is assumed in the simple Gordon model, (ii) the expected dividend growth rate is not free from measurement errors, and (iii) dividend growth is ultimately derived from earnings growth, which is only appropriate if payout ratios are constant. See Lombardo and Pagano (2000).

24 Note that the model deals with expected returns, while we can only observe actual returns. Actual stock returns reflect expectations, but they also embody noise related to the steady flow of surprises. This is why the "true" relationship between the beta and the average risk premium may only materialize over a long period (see Fama and French, 1992).

Unexpected agency costs: The evidence of a positive relationship between stock returns and governance ratings may indicate that investors were surprised by the relative performance of high-CGR and low-CGR firms during the sample period. Gompers, Ishii, and Metrick (2003) argue that this surprise might have been caused by the fact that governance was cross-sectionally correlated with *unexpected* agency costs, as proxied by operating performance, growth, or capital expenditures during the sample period. In this case, well governed firms showed better operating and growth characteristics compared to badly governed firms. In fact, as documented above, firms in the principal portfolio exhibited higher historical growth rates than firms in the agent portfolio. Hence, differences in firm-specific governance practices caused differences in agency costs, and these differences were not properly incorporated into market prices at the beginning of the sample period. Or equivalently, investors underestimated the additional agency costs associated with bad corporate governance practices in the first halve of the 1990s. As soon as this information is public, investors either pay a premium or take a discount on the current stock price. Better firm-specific governance practices have led to improved operating statistics due to lower agency costs, which has ultimately led to higher historical stock returns.

Closing the value gap: Another possible argument is that a certain corporate governance malfunction has led to a stock's valuation below its fair value or peer group valuation. In line with the basic objective of corporate governance to ensure an appropriate risk-adjusted rate of return, better governance will increase the firm's stock price until the value gap is closed and the stock's valuation is broadly in line with its peers. Thereafter, assuming no more governance malfunctions, better corporate governance standards are associated with lower expected rates of return. In this case, the temporary appreciation of the firm's stock price is driven by governance activists rather than the broad market. Governance activists spot malfunctions

early and take an ownership position, which allows them to gain influence on the firm's management and remove eventual governance malfunctions.

We now turn to the regression with the dividend yield as the dependent variable. In panel B of table 7 we report the results from estimating the cross-sectional regression specified in equation (3). The dependent variable is the average yearly dividend yield over the sample period. The independent variables are our firm-level corporate governance rating, the beta (from the first pass-regression), and our proxy for future growth. If the CAPM holds, the null hypothesis is that $\gamma_2 = 0$, i.e., there is no relationship between firm-level governance and dividend yields. Column (1) reports the results from a regression of dividend yields on firm-specific growth rates as the only independent variable. In line with theory, we find a negative, but insignificant, coefficient. When we include our corporate governance rating as an independent variable, GROWTH remains insignificant, but CGR enters with a significantly negative coefficient in column (2). The additional explanatory power of the CGR is also reflected in an increasing R-square, with 13 percent as compared to 4 percent. Finally, even after controlling for growth prospects and market risk in column (3), the governance rating plays a significant role in explaining the cross-sectional differences of dividend yields. While the coefficients for GROWTH and the CGR enter with the hypothesized (negative) sign, beta also has a negative coefficient, which is opposite to what theory predicts.

In summary, dividend yields are better suited to proxy for the expected rate of return than historical returns. First, fundamental variables embody less "noise". Second, since fundamental variables are forward-looking and constantly updated by expected growth rates, they can be better compared with a one-time governance variable. Our results show that expected rates of return depend on other factors than beta, which itself has virtually no explanatory

power in our regressions. Most interesting, and in line with our main hypothesis, there is a significant negative relationship between expected returns, as proxied by the dividend yield, and the quality of firm-level corporate governance.

4. Corporate governance and firm valuation

It is now well established that corporate governance affects firm value. For example, LLSV (2002) show for a cross-section of countries that better shareholder protection is empirically associated with a higher valuation of corporate assets. In this section we explore whether the variation in firm-level corporate governance is associated with differences in firm value. Our valuation measures are Tobin's Q and the market-to-book ratio. Tobin's Q is defined as the market value of assets (calculated as book value of assets minus book value of equity plus market value of equity) over book value of assets, and the market-to-book ratio is calculated as market value of equity over book value of equity. All values are taken as of end 2001. Figure 3 displays the scatter plots for ordinary least square regressions of the corporate governance rating (CGR) against Tobin's Q and the market-to-book ratios, respectively. The corresponding regression results are reported in column 1 of table 8. The adjusted R-squares are 0.032 and 0.037 for the Tobin's Q and the market-to-book value regression, respectively. Supporting our hypothesis, there is a significant relationship with our corporate governance rating in both cases. The effect is not only statistically significant, but its magnitude is also substantial from an economic point of view. For example, for the median firm, the point estimate in the regression for Tobin's Q implies that a one standard deviation change in the governance rating results in about a 24% increase in the value of Tobin's Q. The effect is even more pronounced for the market-to-book ratio; the corresponding coefficient is 0.203. Column 2 shows that adding industry dummies reduces both coefficients in magnitude; the

new values are 0.057 and 0.106 for Tobin's Q and the market-to-book ratio, respectively. The industry classification is again borrowed from Dow Jones EURO STOXX, as was shown in table 4 above. As one could have expected, the dummy variables for healthcare and technology firms significant. In a next step, we confirm that these correlations between our corporate governance rating and firm valuation remain significant when we add a set of control variables into the regression.

An important question is whether good corporate governance *causes* higher firm valuations. As forcefully argued by Black, Jang, and Kim (2003), an important issue in the analysis above is endogeneity. If corporate governance was endogenously determined, we could not make an assessment of the causal connection. Firms with higher market values could simply be more likely to choose better governance structures. Specifically, they can do so for two possible reasons. First, firm insiders believe that better governance structures will further raise firm value. Accordingly, there is a causal relationship, but ordinary least square coefficients will overstate the actual connection. Second, firms adopt good governance to signal that insiders behave well. For example, Klapper and Love (2003) argue that a growing firm with large needs for outside financing has more incentives to adopt better governance practices in an attempt to lower its cost of capital. These growth opportunities are reflected in the market valuation of the firm, implying a positive correlation between governance and Tobin's Q. In this case, there is no causal connection at all. Rather, the signal of management quality, and not the firm's governance practices, affect firm value. Since our governance data have no time variation, there is no appropriate way to address the issue of causality directly.

One way to mitigate the problem of causality is to add appropriate control variables. Specifically, to test whether the relationship between our governance rating and firm valuation could

be spuriously caused by some omitted variables, we add variables which are supposedly associated higher governance rankings. We therefore apply the following firm characteristics as control variables:

- Following Shin and Stulz (2000), among others, we add the logarithm of book asset value into our regressions, denoted as ln(ASSETS). Book values of total assets (as of end 2001) are taken from the Worldscope database.

- Also following Shin and Stulz (2000), we control for firm age using the logarithm of the number of years listed on the German stock exchange, labeled as ln(AGE). Data is taken from the company information section on the website of Deutsche Börse AG.

- Following Black, Jang, and Kim (2003), we include a control variable for the debt-equity ratio, defined as the ratio of total debt to capital, where capital is total debt plus equity. This measure of leverage focuses on the capital employed and best represents the effects of past financing decisions (see Rajan and Zingales, 1995). We denote this capital structure variable as LEVERAGE.

- Probably the most important source of endogeneity are differences in growth opportunities. Growth firms need access to capital markets to raise fresh capital in order to expand their operation. Therefore, they may find it optimal to improve their governance practices, expecting to reduce their cost of capital. The issue is particularly severe, because Tobin's Q is itself regarded as the best measure of growth opportunities and at the same time depends on the cost of capital. Again, our proxy for growth is an average of historical growth and expected earnings per share growth rates (see section 2.2 for the description), labeled as GROWTH.

- Finally, to avoid that we pick up an "index effect", we add a dummy variable that is one if a firm is included in the DAX 30 or the NEMAX 50 index. The market value of common stock may be higher for firms with shares that are more easily accessible for investors. Most important, firms in a major index may be traded at higher values due to demand driven by index funds. They are also likely to have higher liquidity, which supposedly predicts higher market value. The shares in the DAX 30 and the NEMAX 50 index were the most liquidly traded ones in our sample, hence, using a dummy variable seems appropriate to control for an index effect.[25] In addition, our results could be driven by the introduction of the European Monetary Union (EMU). For a Finnish sample, Al-Khail and Berglund (2001) find that the EMU seems to have increased the attractiveness of investments in countries that joined the monetary union (although correlations in the EMU area have increased). Of course, firms in the DAX 30 and NEMAX 50 index should have been most affected by this trend, which might also be reflected in higher valuations.

In column (3) of table 8 we include ln(ASSETS), growth, ln(AGE), and LEVERAGE as control variables. Consistent with prior research, the coefficient on ln(ASSETS) is negative and significant, when either Tobin's Q or the market-to-book ratio is used as the independent variable. As could be expected, more recently listed firms are likely to grow faster and usually have more intangible assets. Hence, they adopt better corporate governance practices, which is reflected in the negative coefficient on ln(AGE). However, the coefficient is only statistically significant when the market-to-book ratio is used as the dependent variable. According to intuition, our proxy for future growth (GROWTH) is significant in both specifications, i.e.,

25 Unfortunately, we did not have access to turnover ratios (defined as the ratio total shares traded and the total amount of shares outstanding) for all stocks in our sample. However, for those firms with available data the correlation between share turnover (liquidity) and membership in either the DAX 30 or the NEMAX 50 index was high.

higher growth opportunities are associated with higher firm valuations. Finally, the coefficient on LEVERAGE is negative and significant. This contrasts with the results in Black, Jang, and Kim (2003), who find a positive relationship between leverage and firm valuation. It also contradicts with the prediction of the static trade-off theory of the capital structure, which posits that higher leverage increases firm value due to the interest tax-shield.

The most important finding is, however, that the corporate governance rating is robust to the inclusion of these additional control variables. This result is slightly more pronounced if Tobin's Q is used as the dependent variable. Interestingly, the magnitude of the coefficients on CGR even increases in the extended specifications. We therefore conclude that the relationship between firm-level corporate governance and firm valuation is not spuriously caused by an omitted variables problem.

In column (4) we add industry dummies as additional variables. Several of them are significant, and the adjusted R-square increases to 0.322 and 0.345 in panel A and B, respectively. Again, our corporate governance rating remains significant. Finally, following the suggestion in Black, Jang, and Kim (2003), we add a dummy variable which is one if a firm is in the DAX 30 or the NEMAX 50 index. The results for Tobin's Q in column (5) of panel A show that we do not merely pick up an index effect, which would imply that firms in the two segments trade at higher valuation due to higher liquidity. Although the index dummy is highly significant, the coefficient on CGR remains significant as well, and even its magnitude is virtually unchanged. However, when the market-to-book ratio is the dependent variable (column (5) in panel B), the coefficient on CGR turns marginally insignificant (with a t-value of 1.530). But note that the magnitude of the coefficient is still considerably high. We conclude

that our results for the relationship between firm-level corporate governance and firm valuation is not (at least not entirely) subsumed by an index effect.

5. Conclusions

While the relationship between legal governance variables and firm performance has been analyzed in several recent cross-country studies, little is known how a broad range of non-legal governance mechanisms affects firm performance within a single jurisdiction. In this study, we fill this gap for the German capital market. To proxy for firm-level governance, we use a rating system to evaluate the stringency of a broad set of governance practices and attitudes. These refer to mechanisms which are not required by current law or regulation, but are rather initiated voluntarily by the firm itself, and cover various governance categories, such as general governance commitment, minority rights, transparency, board matters, and auditing.

Our results document a strong positive relationship between the quality of firm-level corporate governance and firm valuation. The effect is also significant from an economic point of view. For example, for the median firm, the point estimate in the regression for Tobin's Q implies that a one standard deviation change in the governance rating results in about a 24% increase in the value of Tobin's Q. While the data does not allow us to tackle possible endogeneity problems directly, our results are robust to the inclusion of several important control variables. There is also evidence that expected stock returns are negatively correlated with firm-level corporate governance, if dividend yields are used as proxies for the cost of capital. Finally, we document that an investment strategy that bought high-CGR firms and shorted low-CGR firms earned abnormal returns of around 12 percent on an annual basis during the sample period. This return difference cannot be attributed to differences in size or investment style.

Although the legal and regulatory environment is not a useful governance proxy to investigate the relationships of interest within a single jurisdiction, it forms the basis for good corporate governance (see Klapper and Love, 2003). While we believe that adequate legal protection and prosecution capabilities are essential for effective corporate governance, we also argue that other governance categories, such as for example board composition and compensation structures, do not necessarily require further regulation. Instead, with adequate disclosure and transparency standards in place, it is ultimately the capital market which rewards good governance practices and punishes bad ones. Accordingly, corporate governance should be understood as a chance and not an obligation from the perspective of a firm's decision makers.

There are also implications for large shareholders and institutional investors. In Germany, large blockholders as well as institutional shareholders have been rather passive in the past in monitoring and disciplining incumbent management teams. This may also be the reason why studies analyzing whether bank or block ownership is associated with better firm performance showed mixed results. To date, there is no evidence for the German market whether institutional shareholder activism is associated with any short- or long-term wealth effects. However, with governance being a more popular topic for the management and supervision of firms, we believe that professional investors will become more active in shareholder engagement programs in the future. This will ultimately lead to higher cost of capital and lower valuations for those firms with governance deficits.

We should finally point out that adequate firm-level governance standards are not a substitute for the solidity of a firm's business model. Unproven business models and inexperienced management practices cannot be healed with super-transparent disclosure and transparency standards. The decline of 'Neuer Markt' and its recently announced closure is not attributable

to low governance standards, but rather to its poor eligibility criteria in the early years of the growth market’s existence and a record of corporate scandals.

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Table 1: Survey responses and summary statistics

	DAX 30	MDAX	NEMAX 50	SAMX	All segments
Panel A: Survey responses by market segment					
Responses	14	33	13	31	91
Population	30	70	42	111	253
Response ratio	46.7%	47.1%	31.0%	27.9%	36.0%
Panel B: Summary statistics of CGR by market segment					
Minimum	18.5	13.3	17.8	8.5	8.5
Mean	22.6	19.4	21.7	16.8	19.3
Median	22.3	19.3	21.0	17.0	19.3
Maximum	27.3	25.8	25.8	22.8	27.3
S.D.	2.6	3.4	2.2	3.8	3.9

This table shows the survey responses (Panel A) and summary statistics of the corporate governance rating, denoted as CGR (Panel B), by market segments. DAX 30 is the blue-chip index, MDAX the mid-cap index, NEMAX 50 the index of growth companies, and SMAX the small-cap index of the German Stock Exchange. The corporate governance rating ranges from 0 (minimum) to 30 (maximum). S.D. denotes the standard deviation.

Table 2: Correlation matrix for corporate governance subindices

	(I)	(II)	(III)	(IV)	(V)
Governance commitment (I)	1.00				
Shareholder rights (II)	0.13	1.00			
Transparency (III)	0.12	0.30	1.00		
Management and supervisory board matters (IV)	0.43	0.26	0.28	1.00	
Auditing (V)	0.13	0.23	0.21	0.52	1.00

This table shows the correlation among the five corporate governance subindices. The aggregate corporate governance rating (CGR) consists of governance proxies in five categories: corporate governance commitment (I), shareholder rights (II), transparency (III), management and supervisory board matters (IV), and auditing (V). Each subindex is constructed using an equal weighting scheme for the respective survey questions.

Table 3: Corporate governance rating by category

	DAX 30	MDAX	NEMAX 50	SMAX	All segments
Governance commitment	50%	48%	57%	38%	44%
Shareholder rights	70%	64%	50%	50%	61%
Transparency	97%	95%	94%	83%	90%
Management and supervisory board matters	70%	60%	63%	49%	58%
Auditing	83%	65%	95%	62%	70%

This table shows the percentages of firms with *maximum* rating in each governance category. Percentages are shown for each segment as well as for all firms in the sample.

Table 4: Corporate governance rating (CGR) by industry

Sector	∅ CGR	Maximum	Minimum	Number of firms
Basic materials	18.9	27.3	11.3	7
Consumer goods (cyclical)	18.6	24.5	9.75	15
Consumer goods (non-cyclical)	18.9	22.5	15.3	7
Energy	21.6	N/a	N/a	1
Financials	21.0	26.5	14	20
Healthcare	20.9	25.8	14.3	8
Industrials	17.3	22.5	8.5	18
Technology	20.1	25.0	14.5	13
Telecommunications	20.5	N/a	N/a	1
Utility	16.3	N/a	N/a	1

This table shows the summary statistics of the corporate governance rating (CGR) by industry. The industry classification is borrowed from Dow Jones EURO STOXX. 'N/a' indicates that the minimum or maximum CGR would not be meaningful, because there is only one sample firm from a particular industry. The governance rating ranges from 0 (minimum) to 30 (maximum).

Table 5: CGR and firm characteristics

	Mean / median Std. dev. (I)	Correlation with CGR (II)	Mean principal portfolio firm (III)	Mean agent portfolio firm (IV)	Difference (V)
RI	−0.8% / −0.2% 2.7%	0.36***	0.30%	−2.03%	2.33%***
D/P	2.4% / 2.2% 1.9%	−0.24**	1.5%	2.7%	−1.4%**
Tobin's Q	1.63 / 1.17 1.37	0.21**	1.87	1.35	0.52
MTBV	3.76 / 2.57 3.64	0.22**	4.35	3.06	1.29
MV (EURm)	5'358 / 593 15'709	0.27***	9'891	539	9'325***
GROWTH	15.8% / 15.1% 15.8%	0.09	16.9%	14.6%	2.3%

This table contains a description of our data and shows the correlation of firm characteristics with the corporate governance rating (CGR). RI denotes monthly geometric average returns, and D/P is the average of monthly dividend yields over the sample period from January 1,1998 to March 1, 2003. Tobin's Q is the ratio of market value of equity plus total liabilities to total assets, and the market-to-book ratio is the ratio of market value of equity to its book value. Both valuation measures are as of end 2001. MV denotes the average monthly market capitalization (in EURm), and GROWTH is an average of historical growth (computed as the yearly mean of sales and asset growth over the sample period) and expected earnings per share growth obtained from IBES. The principal portfolio consists of the firms with the highest governance ratings (with CGR > 21), and the agent portfolio contains the firms with the lowest governance ratings (with CGR < 18). ***/**/* denotes significance at the 1%/5%/10% level.

Table 6: Three-factor model (principal minus agent)

	Coefficient	S.D.	t-value
Intercept (α)	1.37^{**}	0.57	2.38
RMRF	0.41^{***}	0.12	3.33
SMB	-0.38^{**}	0.16	-2.39
HML	0.05	0.07	0.67
Adjusted R^2	0.58		

This table shows the results of the Fama-French (1993) three-factor model. The sample period is from January 1, 1998 to March 1, 2002. The time series regression model is specified as follows:

$$PMA_t = \alpha + \beta_1 \cdot RMRF_t + \beta_2 \cdot SMB_t + \beta_3 \cdot HML_t + \varepsilon_t.$$

The dependent variable is the monthly return difference between the principal portfolio and the agent portfolio, denoted as PMA (principal minus agent). $RMRF_t$ is the month t value-weighted market return minus the risk-free rate, and SMB_t (small minus big) and HML_t (high minus low) are the month t returns of factor mimicking portfolios designed to capture size and book-to-market characteristics, respectively. ε_t is white-noise. The intercept (α) captures the abnormal return in excess of what could have been achieved by passive investments in the factors. S.D. denotes the standard deviation. $^{***}/^{**}/^{*}$ denotes significance at the 1%/5%/10% level.

Table 7: Corporate governance and stock returns

	(1)	(2)	(3)
Panel A: Dependent variable = Geometric average return			
Intercept	–0.529 –1.294	–5.575*** –3.815	–6.319*** –3.999
CGR		0.247*** 3.577	0.327*** 3.896
Beta	–0.272 –0.701		–0.857*** –2.166
Adjusted R^2	0.008	0.118	0.176
Panel B: Dependent variable = Dividend yield			
Intercept	0.029*** 5.714	0.057*** 5.152	0.056*** 4.582
GROWTH	–0.028 –1.108	–0.024 –1.110	–0.022 –0.894
CGR		–0.001*** –3.123	–0.001** –2.361
Beta			–0.002 –0.463
Adjusted R^2	0.040	0.129	0.122

Panel A shows the results of cross-sectional regressions using geometric monthly average excess returns as the dependent variable. CGR denotes the survey-based corporate governance rating. Beta is estimated for each firm from a time-series regression of monthly returns on the returns of the DAX 100 index over the sample period from January 1, 1998 to March 1, 2002 (first-pass regression). The sample consists of all 91 firms. In panel B, the dependent variable is the average monthly dividend yield during the sample period. We exclude non-dividend paying firms, which reduces the sample size to 71 firms. GROWTH is computed as a simple average of historical growth and expected earnings per share growth. Historical growth rates are derived from either annual growth rates in sales, total asset, or an average of both, depending on data availability, over the sample period. Expected earnings per share growth rates are derived from IBES expected forward year earnings per share divided by the IBES expected current year earnings per share. All estimates are heteroscedasticity-consistent using White's (1980) covariance matrix. ***/**/* denotes significance at the 1%/5%/10% level.

Table 8: Corporate governance and firm valuation

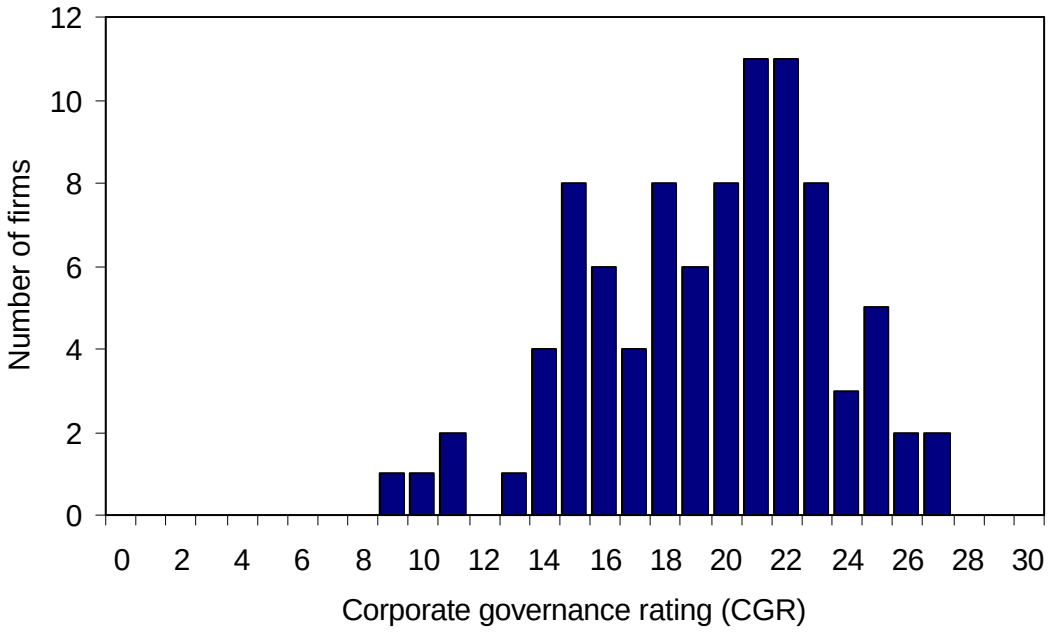
	(1)	(2)	(3)	(4)	(5)
Panel A: Dependent variable = Tobin's Q					
Intercept	0.236 0.396	---	1.990*** 3.989	---	---
CGR	0.072** 1.960	0.057*** 4.601	0.102** 2.135	0.088** 2.215	0.075** 2.030
Ln(ASSETS)			–0.134** –2.083	–0.050 –0.948	–0.065 –1.207
GROWTH			1.679* 1.712	1.828** 2.167	1.690** 2.073
Ln(AGE)			–0.048 –0.960	–0.018 –0.304	–0.004 –0.074
LEVERAGE			–1.397*** –3.415	–1.119** –2.593	–0.964** –2.352
Index dummy	No	No	No	No	Yes
Industry dummies	No	Yes	No	Yes	Yes
Adjusted R^2	0.032	0.217	0.232	0.332	0.354
Number of firms	90	90	83	83	83

Table 8: Continued

	(1)	(2)	(3)	(4)	(5)
Panel B: Dependent variable = Market-to-book ratio					
Intercept	–0.173 –0.110	---	4.215*** 2.880	---	---
CGR	0.204** 2.184	0.106*** 3.158	0.263** 2.299	0.181* 1.880	0.145 1.530
Ln(ASSEST)			–0.298** –1.960	–0.094 –0.746	–0.134 –1.040
GROWTH			4.888* 1.914	5.501** 2.479	5.117** 2.414
Ln(AGE)			–0.584*** –3.236	–0.491** –2.387	–0.452** –2.170
LEVERAGE			–2.029* –1.765	–1.391* –1.310	–0.960 –0.866
Index dummy	No	No	No	No	Yes
Industry dummies	No	Yes	No	Yes	Yes
Adjusted R^2	0.037	0.250	0.236	0.345	0.371
Number of firms	90	90	83	83	83

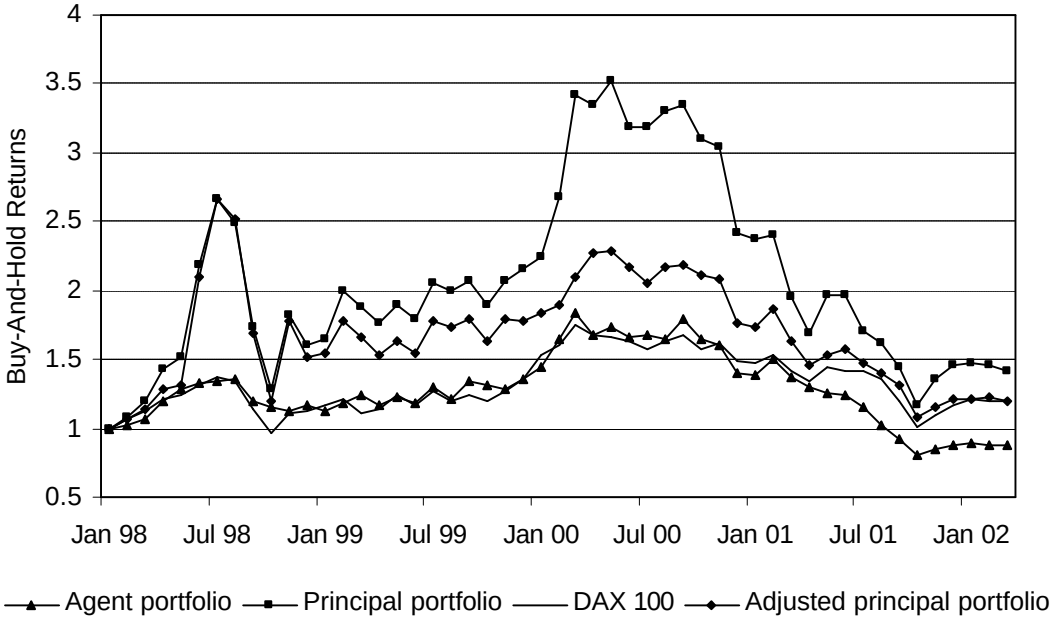
This table shows the results of OLS heteroscedasticity-consistent estimations of the determinants of firm-level market valuation. The dependent variable in Panel A is Tobin's Q, which is defined as the market value of equity plus total liabilities divided by total assets. The dependent variable in Panel B is the market-to-book ratio, which defined as the ratio of market value of equity to its book value. All values are as of end 2001. The regressor variables are defined as follows: ln(ASSETS) denotes the logarithm of book asset value (end 2001), GROWTH is an average of historical growth (computed as the yearly mean of sales and asset growth over the sample period) and expected earnings per share growth obtained from IBES, ln(AGE) is the number of years listed on the German stock exchange, and LEVERAGE is computed as the ratio of total debt to capital. The index dummy is one if a firm is included in the DAX 30 or NEMAX 50 index. The industry dummies are based on the industry classification from Dow Jones EURO STOXX. ***/**/* denotes significance at the 1%/5%/10% level.

Figure 1: Distribution of corporate governance rating



This figure shows the distribution of the survey-based corporate governance rating (CGR) for 91 German public firms. The rating represents an unweighted sum of the basis points (on a five-scale answering range) for all governance proxies in five broad categories: (1) corporate governance commitment, (2) shareholder rights, (3) transparency, (4) management and supervisory board matters, and (5) auditing. The corporate governance rating ranges from 0 (minimum) to 30 (maximum). The ratings in the figure are rounded to the nearest integer.

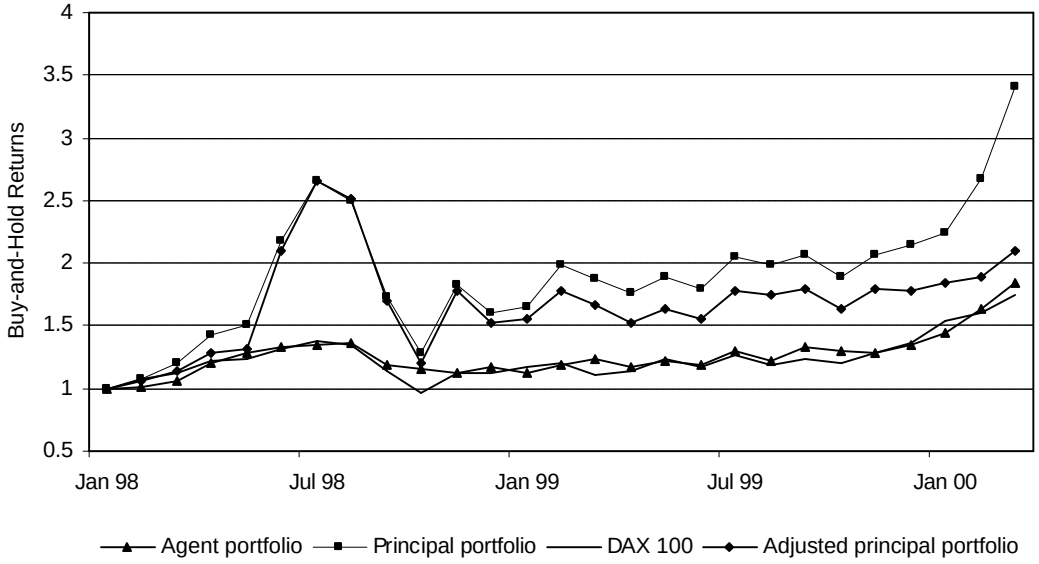
Figure 2: Buy-and-hold returns



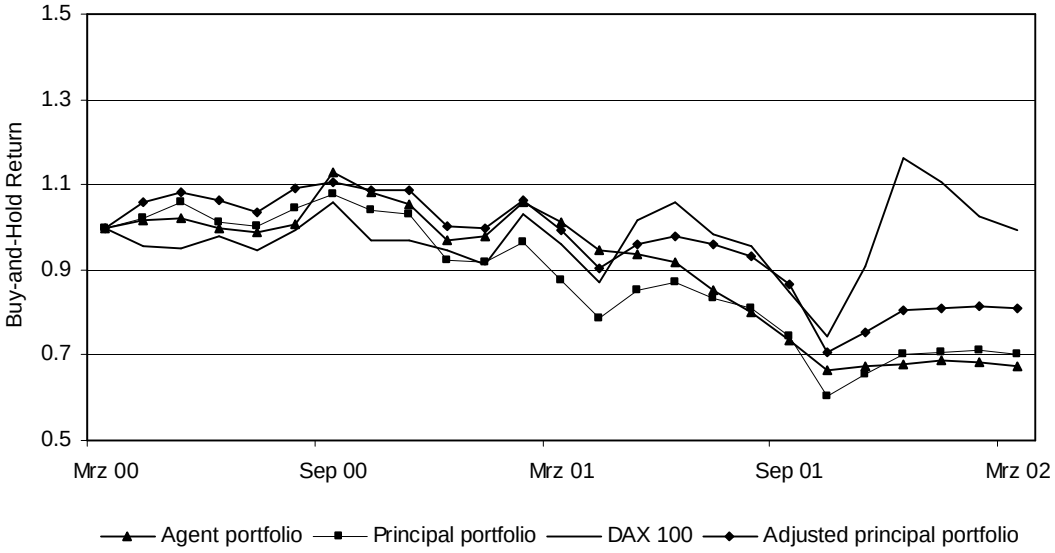
This figure shows the buy-and-hold returns of the principal portfolio, the agent portfolio, and the DAX 100 index. The sample period runs from January 1, 1998 to March 1, 2002 (50 months). The principal portfolio consists of the firms with the highest governance ratings (with CGR > 21), and the agent portfolio contains the firms with the lowest governance ratings (with CGR < 18). The adjusted principal portfolio excludes the firms in the NEMAX 50 index. All portfolio returns are equally-weighted.

Figure 3: Buy –and-hold returns over subperiods

Panel A: Bull market (1998.01 – 2000.03)

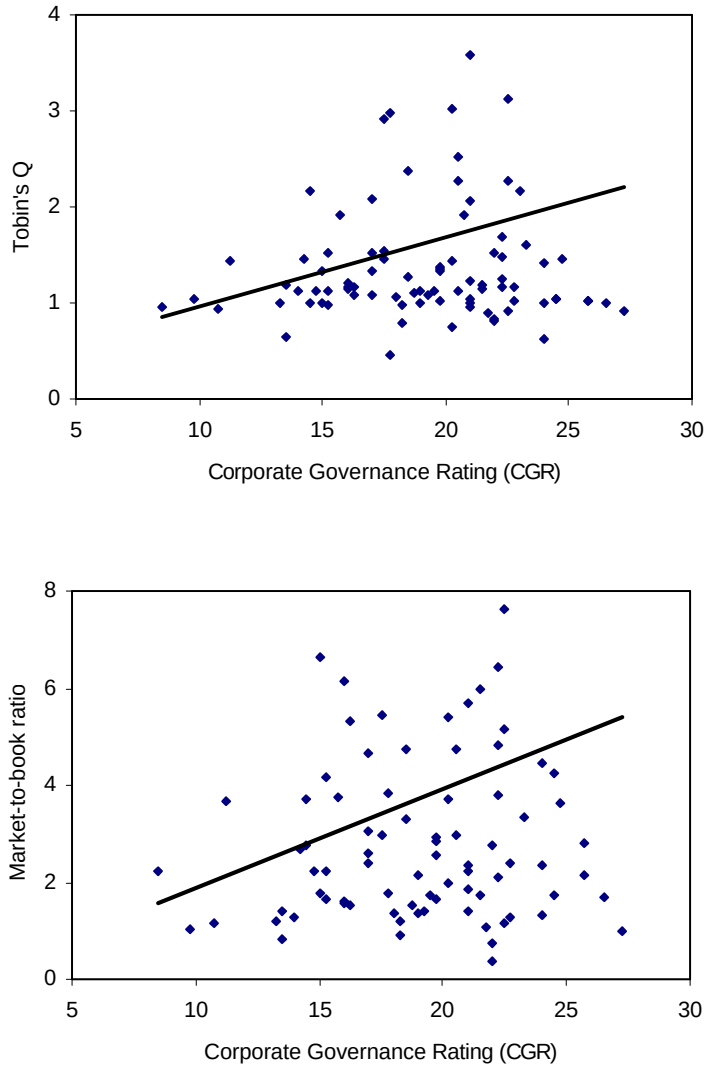


Panel B: Bear market (2000.04 – 2002.03)



This figure shows the buy-and-hold returns of the principal portfolio, the agent portfolio, and the DAX 100 index over two subperiods. The first subperiod from 1998.01 to 2000.03 was a bull a market, and the second subperiod from 1998.04 to 2002.03 was a bear market. The principal portfolio consists of the firms with the highest governance ratings (with CGR > 21), and the agent portfolio contains the firms with the lowest governance ratings (with CGR < 18). The adjusted principal portfolio excludes the firms in the NEMAX 50 index. All portfolio returns are equally-weighted.

Figure 3: Corporate governance rating and firm valuation



The figure shows the scatter plots of the corporate governance rating (CGR) versus Tobin's Q (upper panel) and the market-to-book ratio (lower panel). The fitted lines are estimated using all 90 observations for which we have data on CGR and Tobin's Q and the market-to-book ratio, respectively. The four highest values are suppressed in both scatter plots for better visual representation.