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Abstract

Recent empirical work shows that a better legal environment leads to lower expected rates of return in an international cross-section of countries. This paper investigates whether differences in firm-specific corporate governance also help to explain expected returns in a cross-section of firms within a single jurisdiction. Constructing a corporate governance rating (CGR) for German firms, we document a positive relationship between the CGR and firm value. In addition, there is strong evidence that expected returns are negatively correlated with the CGR, if dividend yields and price-earnings ratios are used as proxies for the cost of capital. Most results are robust for endogeneity, with causation running from corporate governance practices to firm fundamentals. Finally, an investment strategy that bought high-CGR firms and shorted low-CGR firms would have earned abnormal returns of around 12 percent on an annual basis during the sample period. We rationalize the empirical evidence with lower agency costs and/or the removal of certain governance malfunctions for the high-CGR firms.

Keywords: corporate governance, principal-agent theory, asset pricing.

JEL classification codes: G12, G34, G38.

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1 Introduction

In the past few years, corporate governance has become a popular area of discussion in Europe and, increasingly, also in Germany. Having been a topic of academic research for a long time in the Anglo-Saxon literature, corporate governance has only recently moved from a special interest into all sections of the corporate sector and the political scene. In Germany, the recent publication of the *German Corporate Governance Code* for publicly listed companies has further intensified the discussion. There are 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. In particular, Anglo-Saxon institutional investors are important as providers of capital and put pressure on publicly listed companies. This pressure is exercised 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 increasingly 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 its peers for capital in the global equity markets. As a result, there is an increasing convergence of corporate governance principles and practices. Continental European governance systems have already converged in some 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 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 ensuring 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 in the U.S. and elsewhere are the result of the conviction that better corporate governance will deliver higher shareholder value. A recent survey by McKinsey & Company (2000) among institutional investors has shown that they are willing to pay significant premiums for well-governed companies, and that the valuation of a firm is at least as dependent on governance practices as it is on financial issues. For example, in the German case investors are willing to pay a 20.2 percent premium for a company with "good" governance compared to an otherwise identical company, but with "bad" governance. From an asset pricing view, a premium on the current stock

price can only be justified if the expected rate of return on equity is reduced. For a given stream of expected dividends, simple valuation models posit that a firm's valuation is inversely related to the required rate of return on its shares. Therefore, the key question which arises is: Do differences in corporate governance translate into differences in expected rates of return across countries as well as across companies?

The principal-agent theory is generally considered as the starting point for any discussion on corporate governance. Appropriate corporate governance mechanisms, while costly themselves, may reduce the prevailing agency problems and the induced agency costs. In fully integrated world capital markets with no transaction or agency costs of external finance, the traditional Capital Asset Pricing Model (CAPM) predicts that expected returns on equity only depend on the level of covariance risk with the world market portfolio, and corporate governance related differences between countries or individual firms should have no explanatory power. However, in the presence of agency problems, the induced agency costs create a case for differences in the corporate governance system to be important for explaining the cross-section of expected stock returns. Lombardo and Pagano (2002) extend the classic CAPM to include compensation for the expected costs induced by the agency relationship between insiders and outside shareholders. In their model, better governance reduces the expected return on equity to the extent that it reduces shareholders' monitoring and auditing costs.

The discussion among institutional investors, regulators and market participants has led to the central hypothesis that better corporate governance reduces the required rate of return of investors, since it allows them to spend less time and resources on monitoring management teams. Therefore, in this paper we argue that a better understanding of the subject can be achieved by combining the traditional asset pricing approach with the governance approach. Corporate governance constitutes another risk component from an investor's perspective. However, the translation of differences in the quality of corporate governance into expected rates of return (1) across countries (in both developed and emerging market) and (2) across firms within a single jurisdiction is notoriously difficult to measure empirically. Apart from theoretical considerations, empirical studies for German publicly listed firms specifically suffer from a lack of data. Virtually all previous empirical studies have analyzed the impact of various legal variables on the cost of capital in a cross-section of either developed or emerging stock markets. Depending on the selection of independent and dependent variables, these studies have found different regularities. For example, La Porta, Lopez-de-Silanes, Shleifer and Vishny (2002) explore this link indirectly by focusing on the valuation effects of legal and judicial institutions. This is based on the notion that, for a given stream of expected dividends, a firm's valuation is inversely related to the required rate of return on its shares. They report that firms in more protective legal environments, with better investment opportunities, and

with higher cash flow ownership of the controlling shareholder have higher Tobin's Qs. In another recent study, LOMBARDO and PAGANO (2000) estimate cost of capital directly. 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. However, it is positively related with general measures of the quality of legal institutions.

Rather than looking at the legal environment, which affects all firms equally within a single jurisdiction, we take a different approach and focus on the relationship between a broad firm-specific corporate governance rating and an individual firm's expected rate of return in a cross-section of publicly listed firms in Germany. The rating includes a wide range of firm-specific and, to a large extent, voluntary governance proxies related to different control mechanisms. The recently published *German Corporate Governance Code* 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 so-called "comply or explain rule" in the *Transparency and Disclosure Law* (TransPuG), which recently entered into effect. Under this rule, any listed firm unwilling to comply with the code's recommendations must issue an explicit declaration in their annual financial accounts each year and explain its decision to the investment public. This legal setup provides a natural starting point for our empirical analysis. Specifically, it views corporate governance as a chance rather than an obligation. Therefore, the aim of our study is to provide empirical evidence for the German capital market that better corporate governance leads to lower expected rates of return on equity and, hence, higher valuation. In a related study, GOMPERS, ISHII and METRICK (2001) also look at individual firms. They find that firms with weak shareholder rights are less profitable and have lower sales growth than their peers. In addition, firms with weak shareholder rights have higher capital expenditures and more acquisitions than firms with strong shareholder rights.

It must also be noted that Germany is of special interest due to its pronounced difference to Anglo-Saxon countries in many respects of capital market issues. Most important, the *German Corporate Governance Code* explicitly defines the aims of corporate governance as follows:[1]

> *The purpose of corporate governance is to achieve a responsible, value-oriented management and control of companies. Corporate governance rules promote and reinforce the confidence of current and future shareholders, lenders, employees, business partners and the general public in national and international markets.*

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

This is in strong contrast to the Anglo-Saxon view of corporate governance, where there is no 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 in Germany, it seems interesting to analyze the relationship between the cost of capital and governance mechanisms, which are mainly concerned with protecting shareholders as opposed to the general public.

The remainder is as follows. Section 2 presents our empirical framework to capture the influence of firm-specific corporate governance on the cost of equity. Section 3 contains the construction principles and summary statistics of our survey-based *Corporate Governance Rating* (CGR). Section 4 explores the relationship between corporate governance and firm value, and section 5 presents the empirical results for the relationship between corporate governance and the cost of capital. Section 6 concludes.

2 Modelling governance as a reward for risk

In this section we derive a set of testable hypothesis. To measure the relationship between the firm-specific corporate governance system and the expected rate of return on equity, we develop a *Corporate Governance Rating* (CGR) as a proxy for firm-specific governance quality. The approach to use a broad governance rating measure can be rationalized in the context of substantial differences in firm-specific corporate governance in Germany. There are two factors explaining these differences: First, specific market segment regulation in the past years has led to more stringent governance principles for the respective market participants, such as NEMAX firms. Second, some firms have pro-actively adopted certain Anglo-Saxon governance principles, while some of their peers have been rather reluctant on this subject. This pro-activism may be motivated by strong Anglo-Saxon shareholdings, frequent need to access international capital markets, or an existing or planned secondary listing in the United States. This results in a wide variation of the governance structures across German listed firms.

In a first step, we attempt to answer the question inversely by examining the relationship between corporate governance and firm value. Following previous work by La Porta, Lopez-de-Silanes, Shleifer and Vishny (2002) and Black, Jang, and Kim (2002), we relate the market-to-book ratio with the firm-specific corporate governance rating in a cross-sectional regression. We hypothesize to find a positive relationship. However, simple ordinary least square estimates may suffer from endogeneity, i.e., firms with higher market values could

be more likely than other firms to chose better governance structures. To explore whether good corporate governance practices *cause* an increase in firm value, we also apply two-stage least square regression technique.

In a second step, to analyze the issue of interest more directly, recall the Capital Asset Pricing Model (CAPM). It implies a linear relationship between expected returns and market betas, which completely explains the cross-section of expected returns. Following Fama and MacBeth (1973), this proposition can be tested using a cross-sectional regression methodology. Assuming that the betas are known, the regression model for the t-th cross-section of n assets is:

$$\mathbf{r}_t = \gamma_{0,t}\mathbf{1} + \gamma_{1,t}\boldsymbol{\beta}_m + \boldsymbol{\epsilon}_t, \tag{1}$$

where $\mathbf{r}_t$ is the $n \times 1$ vector of excess returns for time period t, $\mathbf{1}$ is an $n \times 1$ vector of ones, and $\boldsymbol{\beta}_m$ is the $n \times 1$ vector of CAPM betas. Estimation of (1) involves two steps. First, given T periods of data, (1) is estimated using OLS for each t, with $t = 1, 2, \ldots, T$. This yields T estimates of $\gamma_{0,t}$ and $\gamma_{1,t}$. In a second step, the time series of $\gamma_{0,t}$ and $\gamma_{1,t}$ are analyzed. Our setup is a simplified version of the specification in equation (1), since we only look at a single cross-section of average historical stock returns. The null hypothesis is that $\gamma_0 = 0$ (zero intercept) and $\gamma_1 > 0$ (positive market risk premium).

This approach is useful, because it can easily be adjusted to accommodate additional risk factors beyond systematic market risk. By adding additional risk measures, we can examine the hypothesis that beta completely describes the cross-sectional variation in expected returns. However, in the standard textbook model with perfect markets, no transaction costs, no agency costs, complete information and costless enforcements of contracts, institutional issues do not play any role in determining the expected rate of return on equity. Lombardo and Pagano (2002) extend the classic CAPM to include compensation for the expected costs induced by the agency relationship between insiders and outside shareholders. In their model the institutional setup matters, hence, 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 goal of our empirical work is to measure whether expected returns can be explained by a risk factor related to governance risk that affects the expected monitoring, auditing and other private costs, as put forth in Lombardo and Pagano (2000) and Lombardo (2000). To this end, let **CGR** be the $n \times 1$ vector with elements corresponding to the *Corporate Governance Rating*, one can augment (1) to investigate if the quality of firm-specific governance has explanatory power not captured by market beta:

$$\bar{\mathbf{r}} = \gamma_0 \mathbf{1} + \gamma_1 \boldsymbol{\beta}_m + \gamma_2 \mathbf{CGR} + \boldsymbol{\epsilon}, \tag{2}$$

where time subscripts are omitted, because we only observe a single cross-section of corporate governance ratings. $\bar{\mathbf{r}}$ denotes the geometric mean of historical returns over the sample period from January 1, 1998 to March 1, 2002. The coefficient γ_2 can be regarded as the reward for risk related to the firm-specific governance quality. The null hypothesis is that $\gamma_0 = 0$, $\gamma_1 > 0$, and $\gamma_2 = 0$, hence, firm-specific governance has no explanatory power beyond the CAPM beta. It has been argued that better governance is associated with lower expected rates of return on equity. However, hypothesizing the direction of the relationship between CGR and expected rates of return may not be straightforward in the specification in (2). Since we believe that the cost of capital changes when firms adopt higher corporate governance standards and that the process is gradual, it is very difficult to use historical returns to measure changes in the cost of capital. Using the reasoning in Bekaert and Harvey (2000), an improvement in the governance measures 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. In fact, we argue that the relationship is likely to be positive for average historical returns as the dependent variable in equation (2). Firms with a high CGR are likely to have improved their governance quality in the years prior to data collection. By removing certain governance malfunctions, these firms are likely to exhibit better performance than their peers with a less appropriate CGR. The better performance of high CGR firms can be rationalized in the context of lower agency costs. Alternatively, referring to simple valuation models, firms with a high CGR have low expected returns, which implies a high current market value. In order to obtain a high valuation today, historical returns must have been higher for high-CGR firms.

From an accounting standpoint, a firm's profitability is often measured by valuation ratios, such as the dividend yield and the price-earnings ratio. In equilibrium, this profitability equals the return that shareholders require to hold the shares of the company in their portfolio. Adjusting for differences in 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. This has the advantage that it can be directly observed and is a stationary variable. From the static Gordon model we know that:

$$\left(\frac{D_{t+1}}{P_t}\right)_i = \rho_i - g_i, \tag{3}$$

where $(D_{t+1}/P_t)_i$ is next years expected dividend (at time $t+1$) divided by the current stock price (at time t) of firm i, ρ_i denotes its (constant) expected rate of return, and g_i is the steady-state growth rate of firm earnings. Accordingly,

holding growth rates constant, high (low) dividend yield firms have high (low) expected rates of returns.[2] Therefore, the dividend yield is intricately linked to the cost of equity capital in the standard textbook valuation model. Under the CAPM, ρ_i depends only on the firm's covariance with the market portfolio. If in addition the required rate of return depends on our survey-constructed governance rating, the augmented model for the cross-section of expected returns is as follows:

$$\frac{\mathbf{D}}{\mathbf{P}} = \gamma_0 \mathbf{1} + \gamma_1 \boldsymbol{\beta}_m + \gamma_2 \mathbf{CGR} + \gamma_3 \mathbf{g} + \boldsymbol{\epsilon}, \tag{4}$$

where $\mathbf{D}/\mathbf{P}$ denotes the vector of average dividend yields during the sample period from January 1, 1998 to March 1, 2002, and is $\mathbf{g}$ the vector with elements corresponding to growth rates in earnings (assuming that payout ratios are constant). We hypothesize that $\gamma_2 < 0$, hence, companies with better firm-specific governance (high CGR) exhibit lower dividend yields. Alternatively, in a strict asset pricing context, high CGR firms have higher valuations and lower cost of capital (correcting for differences in future earnings growth). Clearly, the traditional version of the CAPM posits that $\gamma_2 = 0$, i.e., there is no systematic risk measure beyond market risk.

Similarly, using price-earnings ratios, the empirical model to estimate the relationship between firm-specific governance and cost of equity capital is as follows:

$$\frac{\mathbf{P}}{\mathbf{E}} = \gamma_0 \mathbf{1} + \gamma_1 \boldsymbol{\beta}_m + \gamma_2 \mathbf{CGR} + \gamma_3 \mathbf{g} + \boldsymbol{\epsilon}, \tag{5}$$

where $\mathbf{P}/\mathbf{E}$ denotes the vector of price-earnings ratios at the end of the sample period, i.e., as of March 1, 2002.[3] Following our central proposition, we expect that $\gamma_2 > 0$, hence, companies with better firm-specific governance (high CGR) exhibit higher price-earnings ratios. Again, high CGR firms have higher valuations and lower cost of capital, as couched in terms of higher price-earnings ratios (correcting for differences in earnings growth).

3 Data description

3.1 Constructing a German governance score

The few existing studies on the relationship between governance and expected rates of return, such as Lombardo and Pagano (2000) and Lombardo (2000),

[2] Campbell (1991) derives a more general model with time-varying expected returns. However, the main intuition remains valid.

[3] We think that monthly averages of price-earnings ratios over the sample period are inappropriate, because during the internet bubble earnings expectations were exaggerated for most companies.

focus on the legal environment as the independent variable in a cross-section of countries. This is not surprising, given that the majority of research reflects an Anglo-Saxon approach to corporate governance, which puts the legal environment into the center stage of the discussion. In the United States, with traditionally high dispersion of ownership, the primary methods to solve the agency problems are the legal protection of minority investors, the use of boards as monitors of senior management, as well as an active market for corporate control. As Gompers, Ishii, and Metrick (2001) argue, the strength of these methods is determined by securities regulation, corporate law and bylaws, charter provisions, and other rules. Taken together, these regulations, laws, and provisions "define the power-sharing relationship between investors and managers".[4] In Germany the typical approach to corporate governance is concentrated ownership of large investors, typically banks. In this case, outside (smaller) investors face the risk of expropriation in the form of wealth transfers to larger shareholders. Consequently, a large part of the existing research focuses on the relationship between ownership structure and firm performance. However, the results of these studies diverge substantially and depend strongly on the sample, the sample period and the methodology used.[5]

The objective in this paper is to provide evidence for the hypothesized relationship between governance and expected rates of return *within* a single jurisdiction. Rather than looking at the regulatory environment or ownership structure, which affects all firms similarly within a single jurisdiction, we focus on the relationship between a large set of governance proxies and expected returns in a broad cross-section of German listed firms. Our approach follows Gompers, Ishii, and Metrick (2001), who focus on the relationship between a large set of governance provisions related to takeover defenses and shareholder rights and a firm's long-term performance. Adopting a one-country approach also avoids the classic challenges of international cross-sectional studies. In order to postulate a relationship between corporate governance, expected returns, and other performance parameters for German listed companies, we obtain a broad measure which quantifies firm-specific corporate governance. We identify relevant governance structures to proxy for firm-specific corporate governance risk. The proxies predominantly capture ex ante preventive governance mechanisms, which have the potential to mitigate hidden information as well as moral hazard. They can be initiated and implemented by a firm's decision makers. Together, the full set of proxies is assumed to indicate the governance quality of the respective firm. In total, we gather 30 governance proxies divided into five categories:

[4]See Gompers, Ishii, and Metrick (2001), p. 4.

[5]For a survey of related results see Lehmann and Weigand (2000), Böhmer (2000), and Gugler (2001). 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.

(1) corporate governance commitment, (2) shareholders' rights, (3) transparency, (4) management and supervisory board matters, and (5) auditing. While the notion of a broad governance rating can also be found in Gompers, Ishii and Metrick (2001), our approach does not build on differences in federal and state law regulation and/or corporate provisions at a firm level, but on a variety of voluntary corporate governance proxies.[6] This reflects the common belief that implementing adequate governance structures should be understood as a chance, as opposed to an obligation by corporate decision makers.

To qualify for an inclusion into the corporate governance rating, each proxy (i) must refer to a governance element that is not (yet) legally required and (ii) needs to be considered international market practice from an investor's perspective. A useful source to identify relevant governance proxies is the list of recommendations and suggestions contained in the *German Corporate Governance Code* (GCGC). It represents essential capital markets law for the management and supervision of German listed firms as well as recommendations and suggestions derived from internationally recognized standards of "good corporate governance". If firms deviate from recommendations, they must disclose it in their annual financial statements. This enables companies to reflect sector- and firm-specific requirements. This "comply-or-explain" rule is intended to "contribute to more flexibility and more self-regulation in the German corporate constitution". In contrast, firms can deviate from suggestions without disclosing it. The code has become effective as of February, 26, 2002. Of the 30 proxies included in our corporate governance rating (CGR), the majority represents recommendations of the governance code. Only a few recommendations, e.g., those related to specific management and supervisory board matters, have been disregarded in the questionnaire. We anticipated the response rate to be rather low, because the recipients of the questionnaire either would not know the answers or be unwilling to respond to them for confidentiality reasons. The other governance proxies we use have been derived from the DVFA *German Corporate Governance Scorecard*[7], from CalPERS *German Market Principles*, and from the Deminor *Corporate Governance Checklist*.[8] The Scorecard is a standard evaluation methodology for corporate governance of listed firms developed by the DVFA. The complete set of proxies has been tested on plausibility from a legal and regulatory perspective by Deutsche Börse AG.[9]

A detailed questionnaire with all thirty governance proxies was sent out to all firms in the four principal market segments in Germany: DAX 30, MDAX,

[6]In Germany, unlike in the U.S., there is no state ("Bundesland") specific regulation related to corporate governance.

[7]DVFA is the German Society of Investment Analysis and Asset Management.

[8]Deminor is a governance consulting company based in Brussels.

[9]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.

Table 1: Survey response ratios by market segment

	DAX 30	MDAX	NEMAX	SMAX	All
Responses (sample size)	14	33	13	31	91
Relevant population	30	70	42	111	253
Response ratio	46.7%	47.1%	31.0%	27.9%	36.0%

NEMAX 50, and SMAX, comprising in total 253 firms.[10] 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. This is to ensure that the answers are not overstated by the participating firms.[11] The questionnaire was sent out in February 2002, and the data collection was completed at the end of March 2002. Since the entire relevant population has been contacted via the survey, the scope of the data collection can be regarded as highly extensive in the German stock market. Firms outside the qualified market segments are considered to be less relevant for this empirical exercise. This is because institutional investors are less likely to invest in small cap firms outside the four market segments due to certain investment requirements, such as minimum liquidity and stock turnover levels or size (in terms of sales and market capitalization). Since it is assumed that our corporate governance rating acts as a proxy for the estimated monitoring and auditing costs incurred by institutional investors, little institutional ownership levels would make it difficult to maintain this assumption. The response ratio of the survey exceeded 30 percent across all market segments, except for the SMAX segment, where the ratio was slightly below 30 percent. The survey as a whole had a response ratio of 36 percent. Table 1 shows the break-down of the response ratios by market segments.[12]

To measure firm-specific governance quality, we choose a broad *Corporate Governance Rating* (CGR) as our risk measure. We suspect that cross-sectional regressions of firm performance on single mechanisms, such as board structure or managerial pay, as shown in numerous studies, may be misleading. The construction of the CGR is kept tractable. First, the distinction in the governance quality to derive the CGR is straightforward in almost all cases. Generally, a higher acceptance level of a proxy variable indicates an active move by the firm's management to have improved the corporate governance system. Second, for each firm, 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

[10]The questionnaire is available from the authors on request.

[11]As will be shown below, the distribution of the corporate governance rating across the sample shows that the recipients of the questionnaire did not hesitate to give low ratings to their own governance.

[12]Eight NEMAX firms have been excluded from the original population due to delisting.

as a better firm specific corporate governance. Finally, the CGR is the sum of the basis points per firm across all proxies, ranging from 0 to 30. The maximum score of 30 indicates an outstanding standard of firm-specific corporate governance. While an equal weighting scheme for these proxies makes no attempt to accurately reflect the relative importance of the individual proxies, this approach has the advantage of being transparent and allows easy interpretations.

Having constructed the CGR in this manner, the key question is: How can differences in the CGR translate into perceived risk for shareholders? As argued above, the investor's risk exposure against expected insider expropriation determines the level of agency costs in the form of required monitoring and auditing efforts. The firm-specific CGR, because it is based on a large set of governance variables, can act as a proxy for the estimated monitoring and auditing costs incurred by outside shareholders. The higher the CGR, the lower the required monitoring and auditing costs. We hypothesize that the CGR constitutes a proxy for the risk portion beyond covariance risk with a broad market index, relating to the firm-specific governance system. Unfortunately, the cross-sectional analysis is dictated by the availability of corporate governance data. As there is no German corporate governance database available tracking selected proxies backwards, we cannot quantify the CGR for past years and conduct panel regression tests.

To measure the hypothesized relationship between the CGR and the expected rate of return on equity, we face the fundamental problem that expectations are not directly observable. To proxy for the return on equity, we rely on three different measures: (1) historical stock returns (RI) and fundamental valuation measures, such as (2) dividend yields (DY) and (3) price-earnings ratios (PE). Specifically, we draw monthly total returns of the sample firms over the period from January 1, 1998 to March 1, 2002 (50 months). The total return shows a theoretical growth in value of a share holding over a specified period, assuming that dividends are reinvested to purchase additional units of an equity at the closing price applicable on the ex-dividend date.[13] We calculate monthly geometric mean returns for all firms during the sample period. In addition, we also gather annual dividend yields and price-earnings ratios at the end of the sample period for all firms. The dividend yield expresses the dividend per share as a percentage of the current share price (Datastream datatype: DY). It is based on an anticipated annual dividend and excludes special or once-off dividends. It includes the tax credit applicable to domestic investors. Again, we use the mean of annual dividend yields over the sample period. The price-earnings ratio is defined as the price for a particular stock divided by consensus forecast earnings per share. To be precise, to measure earnings per share we take a simple average of earnings

[13]Gross dividends are used where available and the calculation ignores tax and reinvestment charges.

forecasts for the current financial year and the next financial year (Datastream datatypes: PE1 and PE2).[14]

To measure the true relationship between our corporate governance rating and the expected rate of return, control variables must be included into the regression analysis. When total returns in the secondary market are used to proxy for expected returns, we control for non-diversifiable risk. In addition, dividend yields and price-earnings ratios must be purged from differences in expected growth. Accordingly, for each firm the beta is estimated over the sample period from January 1, 1998 to March 1, 2002, using the DAX 100 index as the market portfolio. In order to proxy for different growth rates, we use forward-looking growth rates, which are calculated as the mean of consensus expected earnings per share growth rates and historical growth rates. 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 (Datastream datatypes: EPS2 divided by EPS1). Historical growth rates are derived from either total sales, total asset growth rates or the mean of both (depending on data availability) over the past five financial years.[15]

As already noted above, we choose a sample period of 50 months, from January 1, 1998 to March 1, 2002. Since no time-varying CGRs are available for German firms, we have to assume a constant governance rating during the sample period. We implicitly argue that investors have used the respective value of the governance rating to form average expectations for monitoring, auditing and other private costs over the sample period. Clearly, this assumption is not perfectly accurate, but we think not critical. This is because in Germany 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 across the sample of firms remained unchanged during the sample period.

3.2 Descriptive statistics

3.2.1 Characteristics of the corporate governance rating

In this section we provide some descriptive statistics for the *Corporate Governance Score* (CGR) as well as for some selected individual governance variables, such as board structure and auditing standards. To start with, figure 1 shows the sample distribution of our Corporate Governance Rating (CGR). To simplify, the CGR has been rounded to the nearest integer (a CGR of 11.25 is reported as a CGR of 11).[16] The histogram shows that the CGR over the sample of 91

[14] All values for PE above 70 are excluded.

[15] The mean is used when data for both sales and total asset growth is available from Datastream. Otherwise, historical growth refers to either sales or total asset growth, depending which data type is available. Both expected earnings growth and historical growth are adjusted and exclude values beyond 50% and -50%.

[16] We do not use rounded CGRs in the regression analysis below.

Table 2: Summary statistics of CGR by market segment

	DAX 30	MDAX	NEMAX	SMAX	All
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	19.8
Maximum	27.2	25.8	25.8	22.8	27.3
Standard deviation	2.6	3.4	2.2	3.8	3.9

firms is slightly skewed to the left. More than 40% of the sample (hence, 38 firms) have a CGR between 20 and 23. It also shows that the governance proxies are adequately selected to reach a wide distribution of CGRs across the sample. This mitigates a possible selection bias in our survey. Given that firms truthfully reveal their governance patterns, the potential bias that only firms with good governance participate in the survey might not be too severe.

[Insert Figure 1: Distribution of the CGR]

Table 2 reports the summary statistics of CGRs by market segment. A closer look at the individual market segments reveals that DAX firms exhibit the highest CGRs, followed by NEMAX, MDAX and SMAX firms. The leading position of DAX firms is not surprising. In addition, the high governance ratings of NEMAX firms relative to the two other market segments can be rationalized in the context of more stringent regulation at the Neuer Markt.[17] 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.

Figure 2 shows the rating of governance proxies by the five categories, as defined above: (1) governance commitment, (2) minority rights, (3) transparency, (4) board matters, and (5) auditing. It becomes clear that governance proxies related to the firms' transparency and auditing standards have been given the highest ratings, while those related to general governance commitment and board matters exhibit the lowest ratings. This is because probably disclosure and auditing standards are easier to implement and enforce from a regulatory perspective.

[17]Trading on Neuer Markt is not organized under public law like the trading on the Official Quotation (Amtlicher Handel) or on the Regulated Market (Geregelter Markt). Instead, it operates as an independent trading segment of the Frankfurt Stock Exchange and trading is organized under private law (modelled on NASDAQ). This structure allows the Deutsche Börse to construct rules and regulations which are more stringent than those of public law market segments. Admission to the Regulated Market is only one of the prerequisites which Neuer Markt applicants have to meet.

In contrast, particularly board structures lack Anglo-Saxon governance character due to the German co-determination regime and cross-shareholder representation.

[Insert Figure 2: Rating of governance proxies by categories]

Figure 3 shows that the CGRs may vary across industry sectors, referring to the Dow Jones EURO STOXX industry classification. Firms in the insurance, chemical, and energy sectors tend to show high CGRs, while firms in the basis resources, retail and utility suppliers sectors have rather lower ratings. However, this analysis can be distorted, since each of the above mentioned sectors is represented by only a few sample firms. If the analysis is reduced to those sectors representing at least four firms, we observe that firms in the healthcare and bank sector tend to show higher CGRs as opposed to firms in the traditionally more domestic oriented sectors, such as industrial goods and services retail or utility supplier. Figure 4 shows the number of firms by industry sectors. The better governance standard of some sectors 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.

[Insert Figure 3: Mean CGR by industry sector]

[Insert Figure 4: Number of firms by industry sectors]

Figure 5 presents the application and practice of accounting principles by market segments. As expected, about two-thirds of all DAX firms in the sample follow internationally recognized accounting principles. Regulation at Neuer Markt requires all NEMAX firms to submit their annual and quarterly reports either under IAS or US-GAAP. The situation is reverse in the MDAX and SMAX segments. More than 50% of the sample firms in both segments still follow German accounting principles.

[Insert Figure 5: Accounting standards by market segments]

Next, we report some details on governance characteristics which are often subject of empirical studies: board size and board independence. Table 3 shows that DAX firms have the largest boards, followed by MDAX firms. The wide discrepancy between minimum and maximum, especially in the case of MDAX and SMAX firms, marks the potential for further board size reduction. Finally, table 4 shows the relative weight of supervisory board members owing more than 5 percent of a firm's share capital. The rationale behind this analysis is that supervisory boards staffed by members representing more than 5 percent of the share capital are generally considered less independent. While for DAX firms 7 percent of the equity representatives are regarded non-independent, the

Table 3: Number of supervisory board members by segment

	DAX 30	MDAX	NEMAX	SMAX
Minimum	6.0	3.0	3.0	3.0
Mean	17.7	12.5	5.8	6.4
Median	20.0	12.0	6.0	6.0
Maximum	21.0	21.0	9.0	20.0

Table 4: Percentage of supervisory board members with >5% of share capital

	DAX 30	MDAX	NEMAX	SMAX
Minimum	0%	0%	0%	0%
Mean	7%	19%	9%	34%
Median	5%	10%	0%	33%
Maximum	19%	67%	67%	100%

numbers are 19 and 34 percent for MDAX and SMAX firms, respectively. This can be rationalized with relatively small free-floats compared to DAX firms and concentrated ownership by founding families or financial/strategic shareholders.

3.2.2 Univariate analysis

Table 5 presents descriptive statistics for the relationship between our CGRs and several financial measures as well as fundamental valuation ratios. MV denotes the average monthly market capitalization, $GROWTH$ measures the average of adjusted sales and asset growth over the past five years[18], and RI is the geometric mean of monthly stock returns. All variables are measured over the sample period from January 1, 1998 to March 1, 2002. DY is the mean of annual dividend yields, PE is the price-earnings ratio at the end of the sample period[19], and $MTBV$ is the mean of monthly market-to-book ratios.[20]

The second column of the table shows the correlation coefficients between each of these variables with our survey-based CGR. For all measures, except for $GROWTH$, the correlation coefficients with our corporate governance proxy are significant. Specifically, firms with better governance tend to be large and

[18]Datastream datatypes: 104 and 392.

[19]Recall, to measure earnings per share we take a simple average of earnings forecasts for the current financial year and the next financial year (Datastream datatypes: PE1 and PE2). All values for PE above 70 are excluded.

[20]All negative values for $MTBV$ and values above 15 are excluded.

Table 5: CGRs and financial characteristics

	Correlation with CGR	Mean principal portfolio firms	Mean agent portfolio firms	Difference
MV (EURm)	0.27***	9891	539	9352***
$GROWTH$	0.14	17%	12%	5%
RI	0.36***	0.30%	-2.03%	2.33%***
DY	-0.24**	1.5	2.7	-1.4%**
PE	0.23**	21.3	15.3	5.1**
$MTBV$	0.31***	5.2	3.4	2.7*
*/**/*** denotes significance at the 10%/5%/1% level.				

receive high valuations relative to their fundamental measures. Consistent with the general notion that high valuations are the result from high past returns, the (positive) correlation between historical returns the CGR is significant at the 1 percent level.

Following Gompers, Ishii and Metrick (2001), we pay special attention to two portfolios. First, the *principal portfolio* is composed of all firms with the highest governance quality, with CGR > 21. Second, firms with the weakest governance quality, with CGR < 18, are placed into an *agent portfolio*.[21] Therefore, the third and fourth columns give the means for these same variables within the principal and agent portfolios, respectively. To reiterate, the principal portfolio includes the firms with the strongest governance structure (CGR > 21). The agent portfolio comprises the firms with the weakest governance structure (CGR < 18). The portfolio returns are all equally-weighted. Finally, the last column shows the differences in the means of all variables between the two portfolios. As could be expected, there are marked differences between the two portfolios. 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 agency portfolio. Consistent with this observation, the the firms in the principal portfolio exhibit significantly lower dividend yields and higher price-earnings ratios. While these results from a univariate analysis are interesting, a multivariate regression analysis is clearly needed to control for financial risk and/or growth characteristics, before more robust conclusions can be drawn on the relationship between the CGRs and expected returns. This analysis is postponed until section 4.

[21]The breakpoints are chosen on the basis of the distribution of our survey-based CGR, as shown in section 3.2.

3.2.3 Portfolio buy-and-hold returns

If corporate governance matters for firm performance and this relationship is fully incorporated by the market, then a stock price should quickly adjust to any changes in firm-specific governance. This is the central notion of all event studies in empirical research. If such a reaction occurs, then expected returns on the stock would be unaffected beyond the event window. However, if governance matters, but is not incorporated immediately into stock prices, then realized returns should differ systematically. In this subsection, we analyze whether such a systematic difference exists.

As shown above, the mean returns of the agent (CGR < 18) and the principal (CGR >21) portfolios are different at the 5% level of significance. We calculate buy-and-hold returns for these two portfolios over the sample period. If one had invested 1 Euro in 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. Figure 6 displays the buy-and-hold returns for the two portfolios as well as the DAX 100 index over the sample period.

[Insert Figure 6: Rolling buy-and-hold returns (1998 - 2002)]

Figure 7 exhibits the difference between the rolling average buy-and-hold returns of the principal and the agent portfolio, denoted as PMA (principal minus agent) return, compared with the broader market index return.

[Insert Figure 7: Rolling abnormal return and market return]

Clearly, the strong outperformance of the Principal Portfolio over the period from January 1999 to April 2000 can be rationalized in the context of the hype valuations on Neuer Markt. Since the CGRs for NEMAX firms tend to be high due to the enhanced governance regulation for this market segment, as illustrated in table 2, several of these firms have entered into the principal portfolio. To avoid any biases, we exclude the NEMAX firms from the principal portfolio and compute the return spread between the two portfolios in figure 8. Evidently, an "adjusted" principal portfolio has still performed better than the agent portfolio and 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 bear market periods, such as between August and October 1998 (Russian crisis) as well as in periods of external shocks, such as after 11 September 2001.

[Insert Figure 8: Rolling buy-and-hold returns (NM adjusted)]

It is obvious 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 with regards to the length of the holding period. In addition, calculating buy-and-hold returns during two subperiods in order to reflect a bull (1/98 - 3/00) and a bear market period (4/00 - 3/02) reveals a similar picture. Figure 9 shows that over the two subperiods the principal portfolio outperforms the agent portfolio. However, during the bear market one can observe a clear Neuer Markt effect. The principal portfolio outperforms the agent portfolio only after excluding firms on Neuer Markt. During this latter period, investors would have been better off holding the market index.

[Insert Figure 9: Rolling buy-and-hold Returns over subperiods]

What can explain this disparity in performance? To answer this question, we explore whether a rational asset pricing model can capture these 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.[22] If the agent portfolio differs significantly from the principal portfolio in these characteristics, then these differences 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 of the the agent and principal portfolio, we estimate the following time series regression:

$$PMA_t = \alpha + \beta_1 \cdot RMRF_t + \beta_2 \cdot SMB_t + \beta_3 \cdot HML_t + \epsilon_t, \tag{6}$$

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.[23] Thus, we interpret the estimated intercept coefficient, α, as the

[22] See Basu (1977) (price-earnings ratio), Banz (1981) (size), Fama and French (1993) (size and book-to-market), Lakonishok, Shleifer and Vishny (1994) (several value measures), and Jegadeesh andTitman (1993) (momentum), among many others.

[23] See Daniel and Titman (1997) for an opposing view.

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

Variable	Coefficient	S.D.	t-statistic	Prob.
HML	0.05	0.07	0.67	0.5057
$RMRF$	0.41	0.12	3.33	0.0017
SMB	-0.38	0.16	-2.39	0.0209
α	1.37	0.57	2.38	0.0217
R-square	0.58			

abnormal return in excess of what could have been achieved by passive investments in the factors. The intercept can be interpreted as 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 (6) over the sample period from January 1, 1998 to March 1, 2002 (50 months). The dependent variable is the monthly difference between the returns on the principal and the agent portfolios, denoted as PMA (principal minus agent). The explanatory variables are $RMRF$, HML, and SMB. $RMRF$ is the return on the DAX 100 market index in excess of the 10-years Bund yield. SMB constitutes the monthly return differences between the DAX 30 and SDAX 100 market indices. HML denotes the monthly return differences between the MSCI growth and value indices for Germany. These indices use price-to-book ($MTBV$) 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 percent level of significance.[24] The negative sign of SMB is consistent with our finding in table 5 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 (PMA) can be explained through market risk and the size effect, but only partly. This is because the (intercept) alpha can be interpreted as the abnormal return, controlling for market risk and style differences. Our estimate for the alpha 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.

[24]This result is in line with the results in Gompers, Iishi, and Metrick (2002).

Table 7: Corporate governance and firm value (OLS)

Variable	Coefficient	S.D.	t-statistic	Prob.
Constant	5.64	2.37	2.38	0.0212
CGR	0.28	0.11	2.67	0.0101
Growth	0.01	0.02	0.44	0.6603
log(Assets)	-0.52	0.16	-3.27	0.0019
R-square	0.156			

4 Corporate governance and firm value

4.1 Simple regression results

Figure 10 shows a scatterplot for an ordinary least square regression of the corporate governance rating (CGR) against the market-to-book ratio. In line with our general notion, there is a positive relationship, as indicated by the upward sloping line of best fit. Firms with higher governance ratings exhibit higher firm valuations, measured by higher market-to-book ratios. The estimated coefficient on the governance rating is positive and significant, with a p-value of 0.0123.

[Insert figure 10: Corporate governance rating and market-to-book ratio]

In table 7, the market-to-book ratio is regressed on the governance rating using ordinary least square. Following Shin and Stulz (2000) and Gompers, Ishii and Metrick (2001), we use the log of book asset value and the average of sales and asset growth as the basic controlling variables.[25] The results show that the coefficient on the governance index is significant and economically meaningful. An increase in the corporate governance index by 3 points results in an increase of market capitalization by 2.8 percent of the company's book asset value. Notice that the corporate governance rating (CGR) ranges from 0 to 30. Surprisingly, growth turns out to be insignificant.

4.2 Two-stage least square regression results

The question remains whether good corporate governance *causes* higher firm valuations. As argued by Black, Jang, and Kim (2002), an important issue in the analysis above is endogeneity. If endogeneity of the variable CGR is indeed a problem, we could not make an assessment on the causal connection. Firms with higher market values could simply be more likely to choose better governance

[25]Due to data limitations the sample size is reduced to 55 firms.

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. In this case, there may be no causal connection at all. The signal of management quality, and not the firm's governance practices, affect firm value.

There are standard econometric techniques for addressing possible endogeneity. All of them require identifying a good instrument. An appropriate instrument must satisfy two conditions. First, it is correlated with the independent variable of interest (corporate governance rating). Second, it is uncorrelated with the error term, i.e., it is correlated with the dependent variable of interest (market-to-book ratio) only through the governance rating. To control for endogeneity, we use two-stage least square regression technique to estimate the coefficients. A dummy variable that takes the value of 1 if the firm is in the DAX or NEMAX segments, and 0 otherwise, is chosen to be the exogenous variable that is supposedly correlated with corporate governance, but that does not appear in the firm value equation. There are three reasons underlying this particular choice of the instrument variable. First, the results in table 2 indicate that the segment of the German stock exchange is an important determinant of corporate governance. Second, and more important, because firms in the NEMAX segment are obliged to adopt higher corporate governance standards by the German stock exchange, the dummy variable can safely be regarded as exogenous. Firms have no choice but to meet the listing requirements. In addition, because they are globally oriented in their activities, DAX blue-chip firms experience exogenous pressure to adopt internationally recognized governance practices. Third, when asset value is also controlled for, it is hard to imagine that the dummy will have any additional explanatory power over firm value other than trough strengthened governance.

Following Stock and Watson (2002), we use the first-stage F-statistic to check the information content contained in the segment dummy.[26] Specifically, the first-stage F-statistic is the F-statistic testing the null hypothesis that the coefficients on the instruments are equal to zero in the first stage of two-stage least square. As a rule of thumb, when there is a single endogenous regressor, a first stage F-statistic less than 10 indicates that the instrument is weak. In this case, two-stage least square estimators are biased, and the t-statistics are unreliable. The first-stage involves a regression of the CGR on a constant, the segment dummy variable, and all exogenous variables (i.e., growth and asset size). The F-statistic of a Wald-test for the null hypothesis that the coefficients on the constant and the segment dummy are jointly equal to zero strongly rejects (with F-statistic>500). This indicates that the problem of weak instruments should not be an issue in our case.

[26]See Stock and Watson (2002), p. 350.

Table 8: Corporate governance and firm value (2SLS)

Variable	Coefficient	S.D.	t-statistic	Prob.
Constant	-4.50	6.10	-0.74	0.4644
CGR	1.25	0.48	2.59	0.0124
Growth	0.01	0.04	0.27	0.7869
log(Assets)	-1.15	0.39	-2.94	0.0050
R-square	0.376			

Table 8 shows the two-stage least square results for our corporate governance rating (CGR). The R-square refers to the second stage regression, using the fitted values of CGR. Compared to the results in table 7, the explanatory power increases considerably (from 15.6 to 37.6 percent). Further, the coefficient on the governance rating is much larger than that estimated by ordinary least square. The coefficient of 1.25 on CGR is significant at the 2 percent level and is five times larger than the ordinary least square estimate in table 7. This result is consistent with causation running from good governance to higher firm value, as measured by the market-to-book ratio. The magnitude of the coefficient is very large from an economic point of views; it implies that an increase in the corporate governance rating by 3 points results in an increase of market capitalization by 12.5 percent of the company's book asset value. Recall again, the governance rating (CGR) ranges from 0 to 30. In contrast, this result does not support either the signaling hypothesis (firms signal quality by adopting good governance rules) or opposite causality (more highly valued firm adopt better governance rules). As before, the average of sales and asset growth is insignificant. Overall, the results confirm the crucial predictions of the theory, namely that poor corporate governance is penalized with lower valuations. This holds not only on a country-level, as shown by La Porta, Lopez-de-Silanes, Shleifer and Vishny (2002), but also for a cross-section of firms within the same (German) jurisdiction.

5 Corporate governance rating and expected return on equity

5.1 Corporate governance and historical stock returns

In this subsection, we use historical stock returns on secondary markets in Germany to measure the relationship between the CGR and the expected rate of return on equity. This assumes that historical returns are good proxies for expected rates of return. In the presence of agency costs, expected returns on equity

may include a risk component not related to the beta of a stock. Similar to the rationale in cross-country studies, differences in expected stock returns may also arise in equilibrium for a domestic cross-section if shareholders' auditing and legal costs differ systematically when investing in different firms. Our approach explores whether a variation in the firm-specific governance system can account for some of the differences in the rate of return on equity. We investigate whether the CGR has explanatory power for the expected rate of return in a cross-section of firms within a single jurisdiction.

However, the relationship between the CGRs and expected returns may simply be the result of different patterns of riskiness across firms. It could be that differences in the CGRs are already captured by the beta factors across the sample firms. Hence, a regression analysis is needed to control for covariance risk embedded in the beta factor before one can draw conclusions about the explanatory power of the CGR. While recent cross-country studies rationalize the effect of governance variables on the expected rates of return with different degrees of international market integration (e.g., LOMBARDO and PAGANO (2000) and LOMBARDO (2000)), the setup in the present study circumvents this issue. Without agency costs, we assume that markets are efficient and the CAPM holds. In a world with agency cost, however, the expected rate of return should also compensate investors for expected monitoring, auditing, and other private costs associated with different corporate governance systems.

The empirical method consists of two steps. First, to estimate company betas, we run for each firm a time-series regression of monthly returns on monthly returns of the DAX 100 index over the sample period. Second, to investigate whether the CGR has explanatory power that is not captured by the market beta, we estimate the cross-sectional regression in equation (2). The sample includes 91 firms. Regression results are shown in table 9. The table reports the results of three different specifications; t-statistics are reported underneath the estimated coefficients, followed by the p-values in brackets.

In column (1) of table 9 we report the regression result of the CAPM for our sample firms. The beta enters with a negative coefficient, not in line with the theoretical predictions. Irrespective of the direction, the beta's overall explanatory power in a univariate analysis is low, with an R-square of 0.8 percent.[27] In the specification in column (2), we introduce the CGR into the regression analysis. In a univariate regression, the coefficient on CGR is positive and significant at the 1 percent level. Finally, in column (3) we control for systematic risk. The null hypothesis that $\gamma_2 = 0$ can be rejected at the 1 percent level of significance, in-

[27]Defenders of the CAPM would argue 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. The noise makes it impossible to judge whether the model holds during one period better than in another. 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)).

Table 9: Regression results for secondary market returns (OLS)

Regressor	(1)	(2)	(2)
Beta	-0.2727		-0.8570***
	-0.8516		-2.6967
	(0.3967)		(0.0084)
CGR		0.2476***	0.3275***
		3.6096	4.5096
		(0.001)	(0.000)
R-square	0.008	0.128	0.194

*** denotes significance at the 1% level.

dicating that firms with a better corporate governance system experience higher returns on equity. This evidence is somewhat at odds with the intuition derived from agency theory. The classic agency perspective predicts that the effect of better firm-specific corporate governance on the expected rate of return is negative, if it lowers the monitoring, auditing and other private costs of investors. What can explain the positive relationship between the CGRs and total returns, which are supposed to act as a proxy for the expected rate of return? We present three possible explanations.

Unexpected agency costs: The evidence of a positive relationship between stock returns on secondary markets and CGRs may indicate that investors were surprised by the relative performance of high-CGR and low-CGR firms during the sample period.[28] As argued by Gompers, Ishii, and Metrick (2001), this surprise might have been caused by the fact that corporate 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 showed, on average, a 5 percent higher growth rate than firms in the agent portfolio. Therefore, the rationale is as follows: Differences in firm-specific corporate governance systems (as quantified by the CGR) caused differences in agency costs, and these differences were not properly incorporated into market prices at the beginning of the sample period. As soon as investors realize the differences in these operating statistics, they either pay a premium or take a discount on the current stock price at that point in time. A better

[28]This rationale also holds under the assumption of constant CGRs over the sample period. It could be that investors of firm A realize the better operating performance in $t_0 + 1$, and for firm B in $t_0 + 2$. The end result is that the historical returns for both firms are higher.

firm-specific corporate governance system (equal to a higher CGR) improved the firm's operating statistics due to lower agency costs, and it has ultimately led to higher historical stock returns and increasing shareholder wealth.[29] As soon as the investors' new expectations have been incorporated into the stock prices, the relationship between CGRs and expected returns is supposed to be negative.

Closing the value gap: Another 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 by the broad market. Governance activists spot malfunctions early and take an ownership position in the respective firm. This ownership position allows them to gain influence on the firm's management and remove eventual governance malfunctions.

Noise effect: Assume a surprise improvement of firm-specific corporate governance, e.g., a sudden change in the firm's disclosure standards. While this should reduce the return required by investors, the immediate result is likely to be an increase in stock prices, i.e., a positive realized return. As argued above, simple valuation models posit a negative relationship between a firm's valuation and the required rate of return on its shares, all else equal. Given that we estimate expected returns from realized returns, capturing the negative relationship between corporate governance and expected returns seems to be difficult, if not impossible.

In summary, there are a number of challenges when estimating the "true" correlation between our firm-specific governance variable and the expected rate of return, if historical stock returns are used as a proxy. This is because historical returns seem less suited to proxy for expected rates of return due to "noise" and short-term market reactions on governance changes. Accordingly, a long-term study with time-varying governance variables would be needed to capture any negative relationship. Nonetheless, there is evidence that the CGR has significant explanatory power, even over a medium sample period. Due to the difficulties using historical returns as a proxy for expected returns, we proceed using fundamental ratios to measure the direction of the relationship between governance measures and the cost of equity capital.

[29] See Gompers, Ishii, and Metrick (2001), p. 34.

5.2 Dividend yield and price-earnings ratio

We first report the results from estimating the cross-sectional regression in equation (3). The dependent variable is the average yearly dividend yield over the sample period. The independent variables are (1) the beta as estimated from a regression of company stock returns against the returns on the DAX 100 index over the sample period, (2) the survey-based CGR, and (3) the expected earnings growth rate, g. If the CAPM holds, the null hypothesis is that $\gamma_2 = 0$, i.e., there is no relationship between CGRs and dividend yields. While we expect the dividend yield to be negatively correlated with g, we do not assume $\gamma_3 = -1$ to hold, unless the restrictive assumptions of the Gordon Growth Model would apply. 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.[30] Expected growth rates are calculated as the mean of expected earnings per share growth rates and historical growth rates. In this way, historical growth is "updated" with expected earnings growth, which has a forward-looking character. 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. Historical growth rates are derived from either sales, total asset growth rates, or the mean of both over the past five years (depending on data availability).[31] The regression results are reported in table 10. Again, t-statistics are shown underneath the estimated coefficients, followed by the p-values in brackets.

In column (1) we report 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 and highly significant coefficient for the expected growth rate. In a next step, in column (2) we also include the CGR as an independent variable. As expected, g remains significant, but the CGR also enters with a significantly negative coefficient. The additional explanatory power of the CGR is also reflected in an increasing R-square, with 20 percent as compared to 12.4 percent. Finally, even after controlling for growth prospects and market risk in column (3), the CGR plays an important role in explaining the cross-sectional differences of dividend yields. While the coefficients for growth and the CGR enter with the correct sign, the beta has a negative coefficient, which is opposite to what theory predicts. Moreover, similar to the evidence found above, beta's explanatory power is negligible, which can be rationalized with "noise" over a relatively short measurement period.

[30] See Lombardo and Pagano (2000), p. 21.

[31] Datastream datatypes: EPS2 divided by EPS1. Growth rates in excess of 50% (−50%) are ignored in our analysis. It must be noted that due to the fact that expected earnings growth rates and/or historical growth rates are not available for many of the small firms, the sample is reduced from 91 to 67 firms.

Table 10: Regression results for dividend yields (OLS)

Regressor	DY	(2)	(2)
Growth	-0.0303*	-0.0299**	-0.0255*
	-1.9910	-2.0508	-1.7175
	(0.0507)	(0.0444)	(0.0909)
CGR		-0.1604**	-0.1310**
		-2.5719	-1.9982
		(0.0124)	(0.0500)
Beta			-0.4575
			-1.3671
			(0.1765)
R-square	0.057	0.146	0.170

*/** denotes significance at the 10%/5% level.

Next, we use price-earnings ratios to measure the hypothesized negative relationship between the CGR and the expected rate of return on equity. We expect that higher CGRs are associated with higher price-earnings ratios. Following the specification in equation (4), we run a cross-sectional regression of price-earnings ratios on firm-specific betas, CGRs, and expected earnings growth rates. Again, we test the null hypothesis that $\gamma_2 = 0$, i.e., there is no relationship between a firm's CGR and its price-earnings ratio. The dependent variable is the mean of PE1 and PE2 for each firm at the end of the sample period (March 1, 2002). The price-earnings ratio variable are defined as the price for a particular stock divided by consensus forecast earnings per share, either for the current financial year or for the next financial year, respectively.[32] All independent variables are defined as described above. Regression results are reported in table 11, t-statistics are shown underneath the estimated coefficients, followed by the p-value in brackets.

In column (1) we report the basic specification including the growth factor as the only explanatory variable. The sign of the coefficient is positive, but insignificant. When we also include the CGR, controlling for growth, the coefficient on the governance proxy enters with the correct sign and is significant on the 5 percent level. Again, this result is remarkable, because it suggests that firm-specific governance has a higher explanatory power for the level of the price-earnings ratio than a firm's growth prospects. Consequently, the R-square increases from merely

[32]Datastream datatypes: PE1 and PE2, respectively. It must be noted that due to the fact that price-earnings ratios from IBES and expected earnings growth rates and/or historical growth rates are not available for many of the small firms, the sample is further reduced from 91 to 53 firms .

Table 11: Regression results for price-earnings ratios (OLS)

Regressor	(1)	(2)	(2)
Growth	0.0818	0.0962	0.0926
	1.1034	1.3293	1.2845
	(0.2750)	(0.1898)	(0.2050)
CGR		0.6496**	0.5484*
		2.0070	1.6465
		(0.0502)	(0.1059)
Beta			2.7353
			1.2101
			(0.2320)
R-square	0.023	0.096	0.122

*/** denotes significance at the 10%/5% level.

2 percent without the CGR to almost 10 percent if the CGR is included in the estimation. Finally, in column (3) we report the full specification of the model, using growth, CGR, and systematic risk as the independent variables. Interestingly, the CGR is the only significant variable. We conclude that firms with better governance exhibit significantly higher price-earnings ratios and, hence, lower cost of equity capital. Both growth and beta remain insignficant. These results are again highly inconsistent with the CAPM.

In summary, the estimation methodology used in this section provides further evidence that dividend yields and price-earnings ratios are better suited to proxy for the expected rate of return. First, fundamental variables embody less amount of "noise". Second, since fundamental variables are constantly updated by expected growth rates, they can be better compared with a one-time governance variable, which itself has a forward-looking character. 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 relationship between expected returns, as proxied by dividend yields as well as price-earnings ratios, and the quality of firm-specific corporate governance.

5.3 Robustness tests

In the previous sections we have provided evidence that expected returns depend on the governance structure of a firm in addition to its riskiness. We find a negative relationship between the CGR and proxy measures for the expected

Table 12: Results for two-stage least square regressions

Regressor	*RI*	*DY*	*PE*
Growth		-0.0299*	0.0699
		-1.7106	0.8683
		(0.0921)	(0.3895)
CGR	0.8692**	-0.4385**	-0.4338
	3.5815	-2.1284	-0.4753
	(0.0006)	(0.0327)	(0.6367)
Beta	-1.8235**	0.0567	4.4113
	-3.1990	0.1127	1.5536
	(0.0019)	(0.9196)	0.1267
R-square	0.200	0.198	0.079

*/** denotes significance at the 10%/5% level.

rate of return on equity, such as the dividend yield and price-earnings ratio. An interpretation may be as follows: Expected returns must compensate investors not only for financial risk, but also for expected monitoring, auditing and other private costs, which are higher in firms with less appropriate governance structures (equal to smaller CGRs). To check whether causation runs from better corporate governance to lower cost of capital, we re-estimate the regressions in sections 5.1.-5.3. using two-stage least square. As discussed in section 4.2, we again use the segment dummy as our instrument to control for endogeneity. Table 12 shows the results for all three proxy variables. The results for historical returns and dividend yields remain qualitatively the same. Specifically, the coefficients on the governance rating (CGR) are significant and of the correct sign. As before, the coefficients on CGR are somewhat larger compared to the ordinary least square results. Unfortunately, the results for the price-earnings ratio do not support our hypothesis. The coefficient on CGR shows up with a negative sign (which is contrary to what one would expect), but remains insignificant.

In another robustness test we explore whether different industries account for different risk-adjusted expected returns. This may be the case either because markets are segmented along industries or because different industries incur different expected agency costs. Our sector classification follows along the 18 industry indices provided by Dow Jones EURO STOXX. Using average historical returns as the dependent variable, we run an extended cross-sectional regression:

$$\bar{\mathbf{r}} = \gamma_0 \mathbf{1} + \gamma_1 \boldsymbol{\beta}_m + \gamma_2 \mathbf{CGR} + \gamma_3 \mathbf{ID}_1 + \gamma_4 \mathbf{ID}_2 + \ldots + \gamma_{19} \mathbf{ID}_{17} + \boldsymbol{\epsilon}, \qquad (7)$$

where $\mathbf{ID}_1$ to $\mathbf{ID}_{17}$ are vectors with industry dummy variables. We test the

Table 13: Industry robustness test

Regressor	RI	DY	PE
Growth		-0.0642***	0.1013
		-2.7941	1.1527
		(0.0076)	(0.2571)
CGR	0.3502***	-0.1814*	1.0532**
	4.2118	-1.6941	2.4083
	(0.0001)	(0.0970)	(0.0216)
Beta	-1.1645***	-0.0998	0.2514
	-3.0900	-0.1735	0.0601
	(0.0029)	(0.8630)	(0.9524)
Industry dummies	n.s.	n.s.	n.s.
R-square	0.332	0.286	0.330

*/**/*** denotes significance at the 10%/5%/1% level.

null hypothesis that $\gamma_i = 0$, with $i = 3, 4, \ldots, 19$. For dividend yields and price-earnings ratios, the specifications in (4) and (5) are tested similarly, additionally expanded by the growth factor, g. The results are shown in table 13. As before, t-statistics are reported underneath the estimated coefficients, followed by the p-values in brackets. "n.s." stands for "not significant". The empirical evidence shows that even after controlling for industry effects, the explanatory power of the CGR persists in all three regression specification. At the same time, none of the industry dummies enters with a significant coefficient.

6 Conclusions

Corporate governance in Germany has attracted a lot of attention in the last years. Prominent surveys among institutional shareholders have shown that investors are willing to pay significant premiums for well-governed companies, and that the valuation of a firm is at least as dependent on governance practices as it is on financial issues. While the relationship between legal governance variables and firm performance has been analyzed in several recent cross-country studies, little is known how a whole range of non-legal firm-specific governance mechanisms affects the required return on equity within a single jurisdiction. We argue that legal variables are the only plausible variables to enter into cross-country studies, since the efficiency of other governance variables, such as ownership, board structure or compensation schemes, is influenced by country-specific particularities which may bias the results in cross-country studies. Moreover, legal variables, such as judicial efficiency, have rather little variation among the developed coun-

tries. Hence, we expect to draw more reliable conclusions on the relationship between corporate governance and firm performance using input data from one country. In this study, we fill this gap for the German capital market. To proxy for firm-specific corporate governance, we use a rating system to evaluate the stringency of a whole range of firm-specific ex ante control mechanisms. These refer to mechanisms which are not required by current law or regulation, but are rather initiated voluntarily by the firm itself, and include mechanisms of different governance categories, such as general commitment, minority rights, transparency, board matters and auditing. Our results show that there are significant differences in firm-specific governance across German firms.

To model the relationship between governance and expected returns, we apply the following rationale: If existing ex ante governance mechanisms are ineffective or inappropriate, large shareholders and institutional shareholders have a higher incentive to discipline incumbent management for their failures and start monitoring more actively. Since monitoring activities incur costs, investors require an adequate compensation in the form of a higher expected rate of return on equity. As soon as firm-specific corporate governance practices improve, the required return on equity decreases. This implies a higher firm valuation, since the investors' monitoring activities are trimmed down. In line with this hypothesis, we find a strong relationship between our corporate governance rating (CGR) and firm value. To proxy for the rate of return on equity, we use historical returns, dividend yields, and price-earnings ratios. We report evidence that there is a negative (positive) relationship between the CGR and dividend yields (price-earnings ratios) in a cross-section of German firms. This observation is in line with the predictions from agency theory. The relationship between average historical returns and the CGR is significantly positive, suggesting that higher CGR-firms have performed better in the past. We rationalize this evidence with lower unexpected agency costs and/or the removal of certain governance malfunctions in high CGR-firms. Most of our results are robust for endogenity, which implies that causation is running from corporate governance practices to firm fundamentals. Finally, an investment strategy that bought high-CGR firms and shorted low-CGR firms would have earned abnormal returns of around 12 percent on an annual basis during the sample period.

There are three conclusions which can be drawn from our empirical results. First, firm-specific corporate governance matters from an asset pricing perspective. It could be regarded as an additional risk factor for which investors require an adequate compensation in terms of higher expected returns. Accordingly, the overall message to listed firms is simple: By striving for better governance, firms are able to further reduce their required return on equity.

Second, although the legal and regulatory environment is not a useful governance proxy to investigate the relationship of interest within a single jurisdiction (since all companies are similarly affected), it forms the basis for "good corporate

governance". While we believe that adequate legal protection and prosecution capabilities are essential for effective corporate governance, we 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 (high CGRs) and punishes bad ones (low CGRs). To this end, corporate governance should be understood as a chance and not an obligation from a firm's perspective.

Third, there are 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 show a mixed picture. 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. Ceteris paribus, this will ultimately lead to higher expected returns and lower valuations for those firms with governance deficits, since investors want to be compensated for their increased monitoring and second opinion activities. Similarly, by removing certain governance malfunctions, large investors are able to achieve a higher valuation for their assets, since their required return becomes lower.

In Germany more stringent legislative measures have been put in force only recently, including the 4th *Financial Market Promotion Law* and the *Transparency and Disclosure Law*, to enhance stock market integrity. While the Transparency and Disclosure Law forms the legal basis for the *German Corporate Governance Code* to become binding as a soft-law supplement, some of principal measures of the Financial Market Promotion Law include: (1) establishment of the central Federal Institute for Financial Services Supervision to enable effective action to be taken against price and market manipulation, (2) mandatory disclosure without delay of dealings by members of management and supervisory boards of all listed companies and their close relatives in stocks of the firms they represent, and (3) establishing a basis for investors to claim compensation for the effects of late, omitted, or incorrect disclosure of price-sensitive information by firms. In light of the recent corporate governance failures, the list of claims for more rigorous law and regulation to protect investors in Germany is long, such as for example a similar move as the SEC's to oblige CEOs and CFOs to personally certify their firms' accounts. There are also plans to boost shareholder rights by taking actions against members of a firm's management and supervisory boards in cases of false or misleading information. Existing German securities law is regarded as too restrictive by investors' representatives, as it only allows action

to be taken against a company, rather than individuals.

It should also be pointed out that adequate firm-specific 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. This is also the reason why the decline of the Neuer Markt and its recent announced closure is not attributable to the growth market's governance standards (in fact, they have been the strictest in Germany), but rather to its poor eligibility rules in the early years of the market segment's existence and a record of corporate scandals. It is even envisaged that the Neuer Markt's current disclosure, transparency and listing requirements will apply to the new "Prime Standard" that will include both the DAX 30 blue-chip stocks and as well as mid-cap stocks divided into "Classic" and "Technology".

Finally, our results raise more questions for future research. In Germany, little is known about the role and design of shareholder engagement activities by blockholders and institutional investors and associated wealth effects. If the better governance practices of the high-CGR firms can be attributed to shareholder activism prior to their implementation, the message to professional investors is clear: By identifying firms with solid business models but current governance slacks, shareholder engagement activities may lead to higher actual returns until the governance practices have improved. The impact on equity markets is even more far-reaching. If professional investors generally incur higher costs due to more engagement activities and face higher risk in light of the recent governance failures, then a general revaluation of stocks is likely to compensate investors for owning equity in the market place. However, to make a more reliable statement of the relationship between firms-specific governance and expected returns on equity, we would need to regress time-varying governance variables on performance measures. Moreover, it would be interesting to know whether the negative relationship between governance practices and expected returns can be also found in other Western countries with a similar legal environment.

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Figure 1: Distribution of the CGR

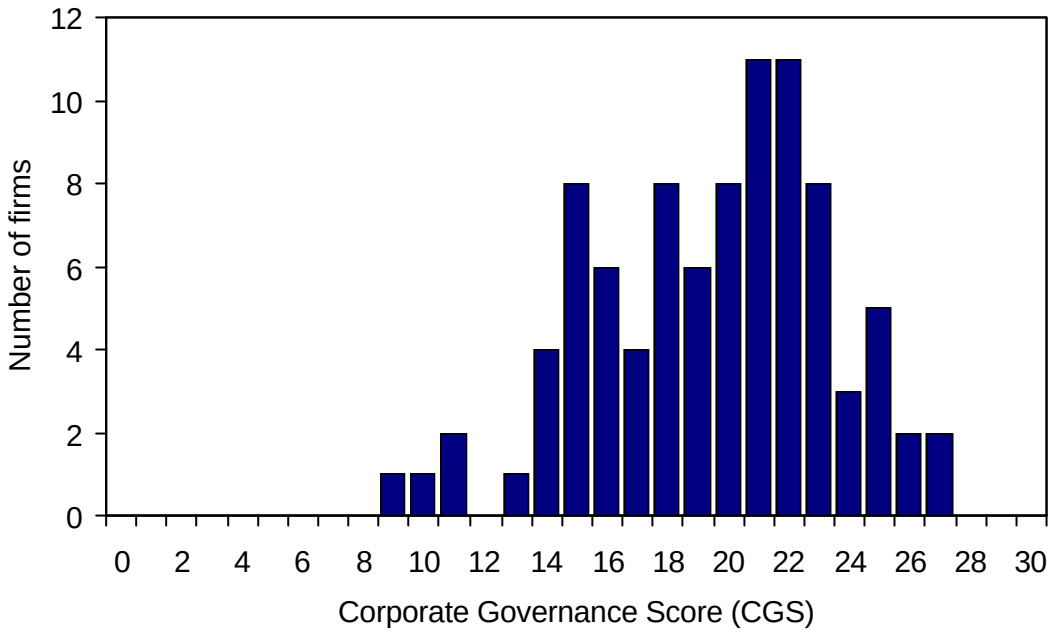


Figure 2: Rating of governance proxies by categories

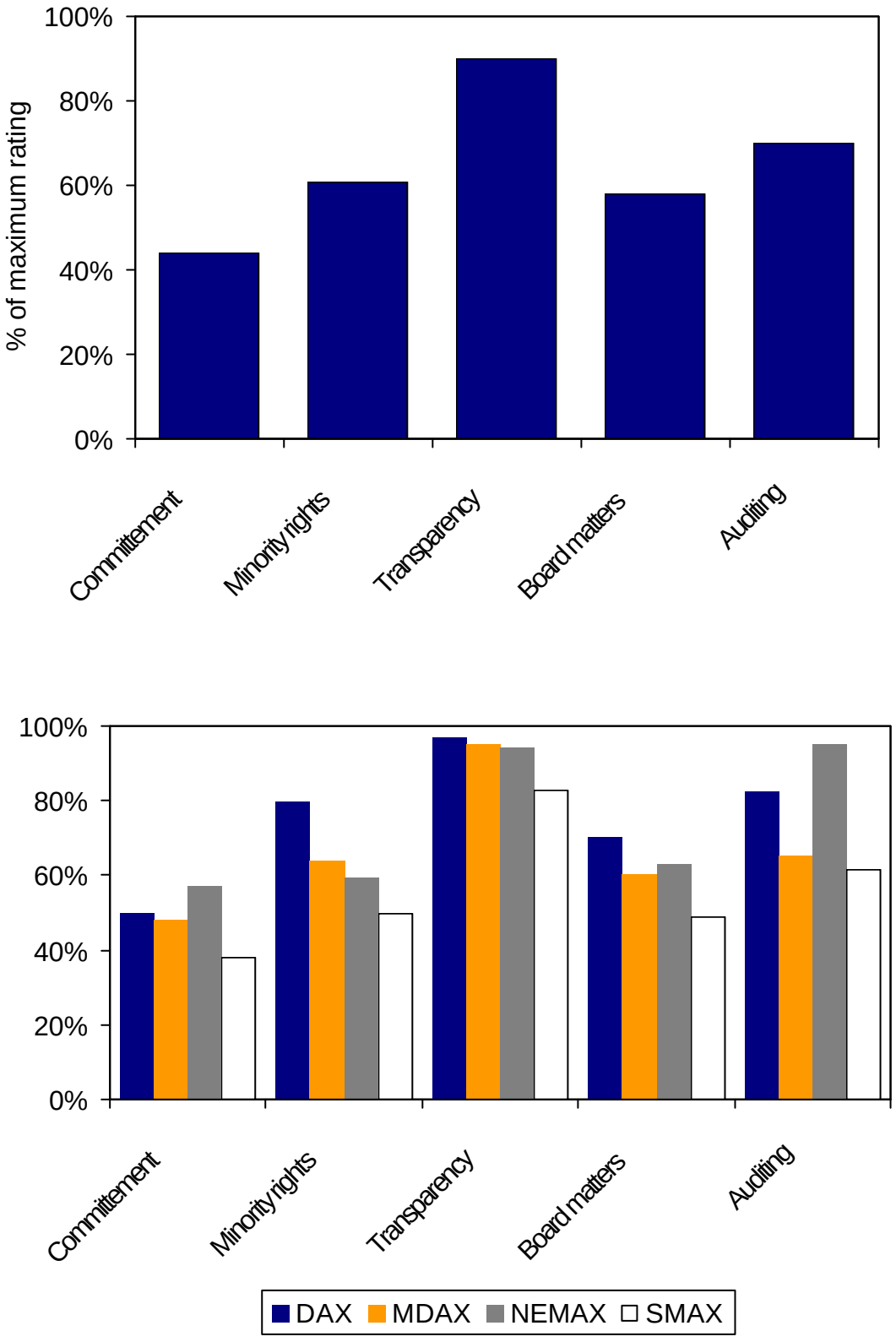


Figure 3: Mean CGR by industry sector

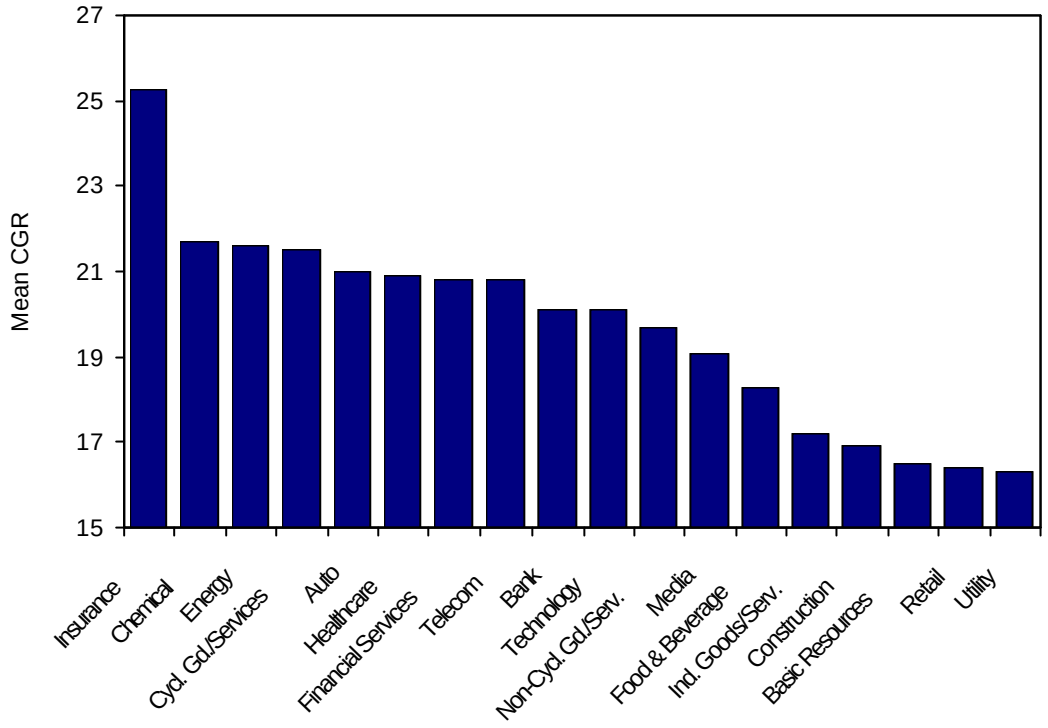


Figure 4: Number of firms by industry sectors

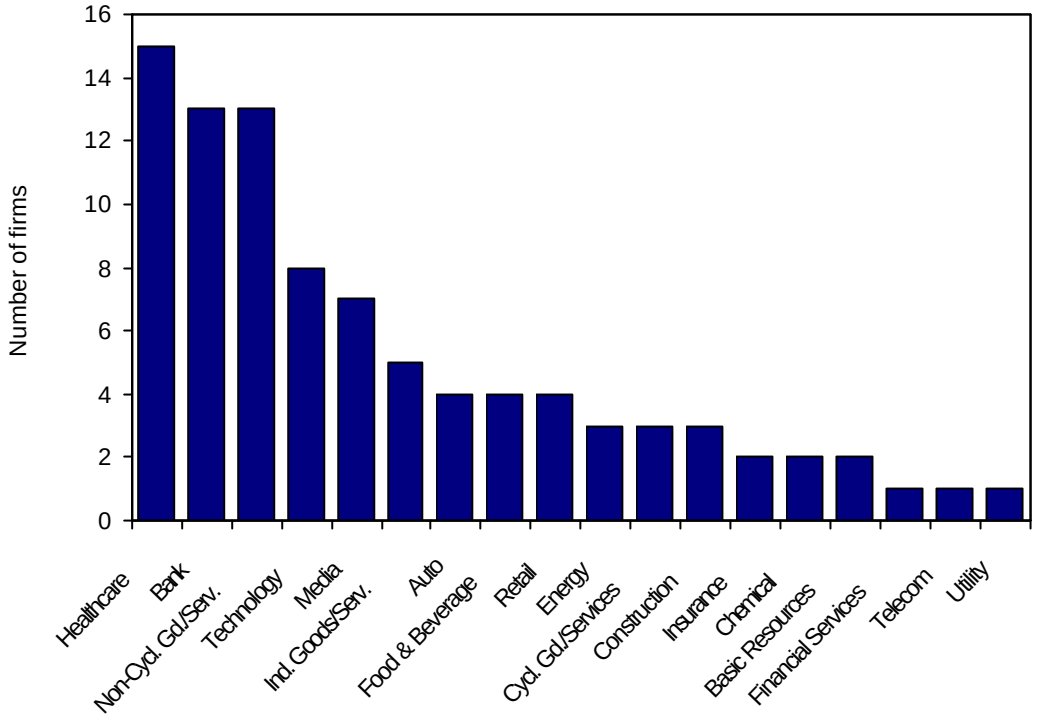
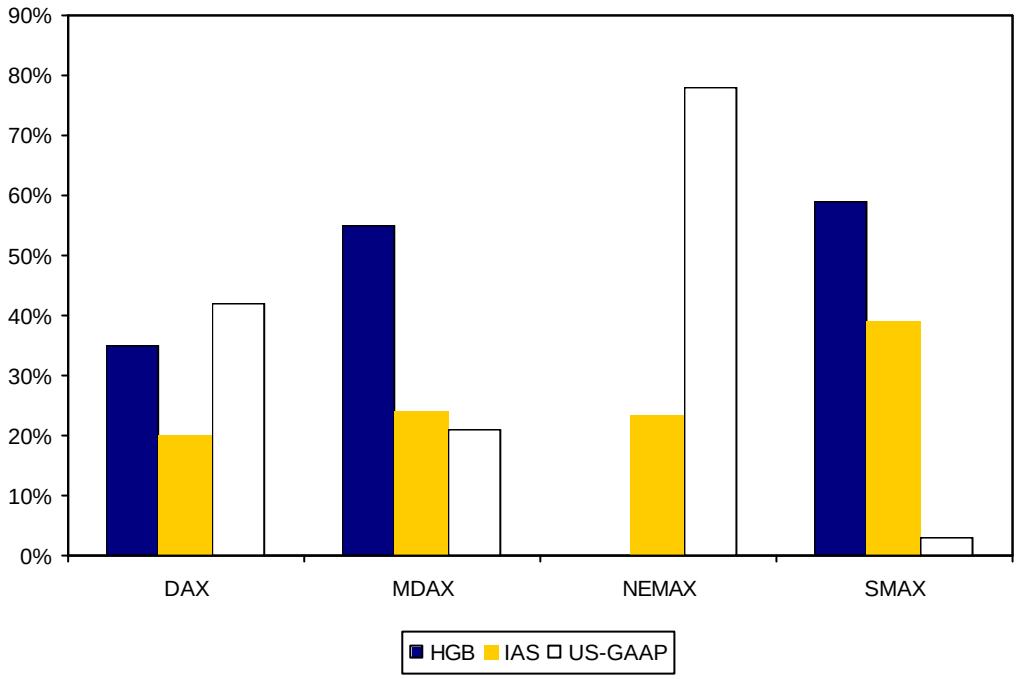


Figure 5: Accounting standards by market segments



Note: HGB is the “Handelsgesetzbuch” according to German law.

Figure 6: Rolling buy-and-hold returns (1998 - 2002)

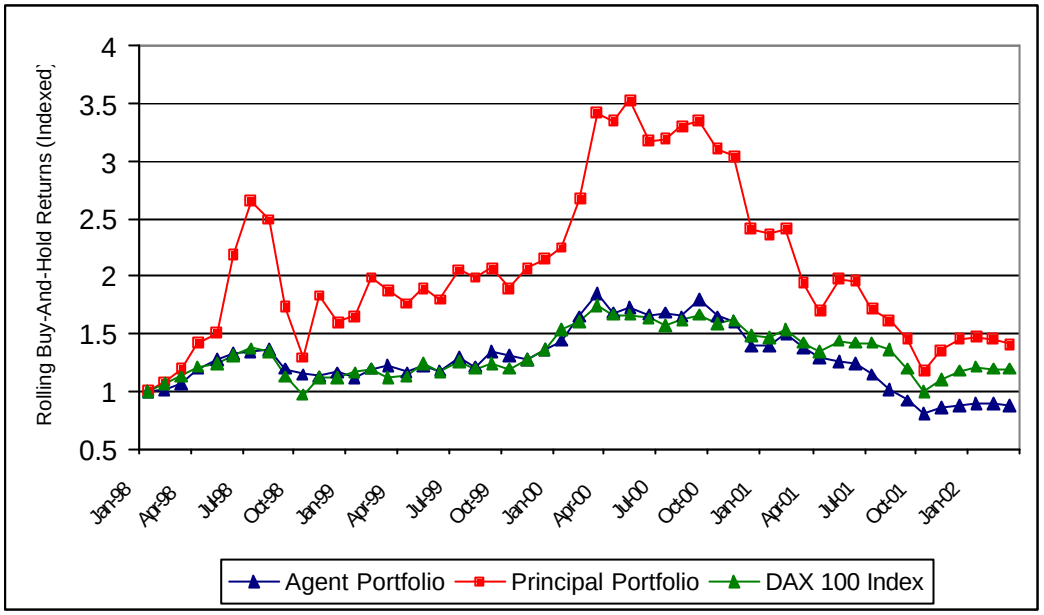


Figure 7: Rolling abnormal return and market return (principal minus agent)

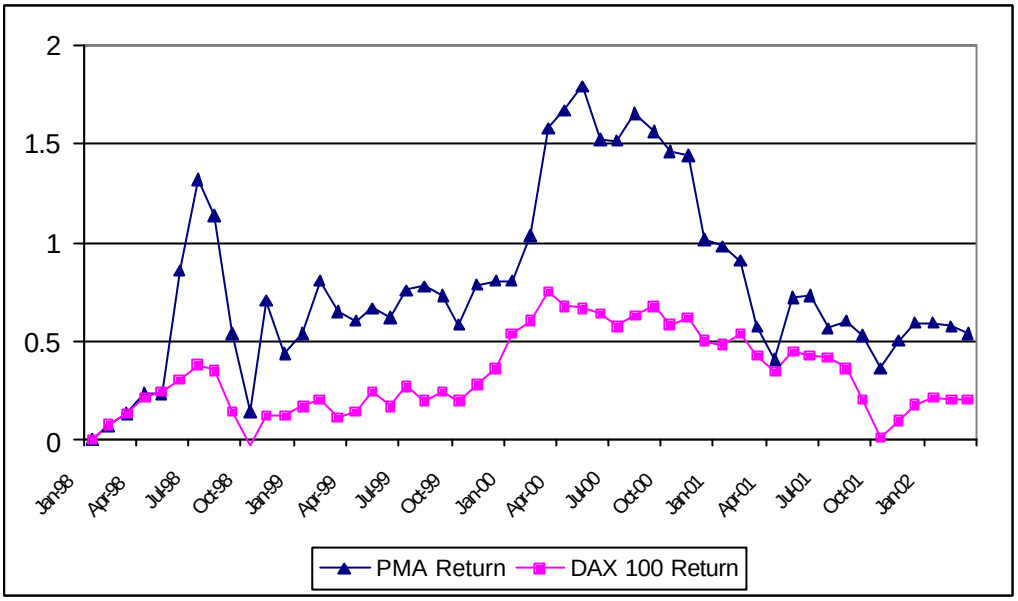


Figure 8: Rolling buy-and-hold returns (NM adjusted)

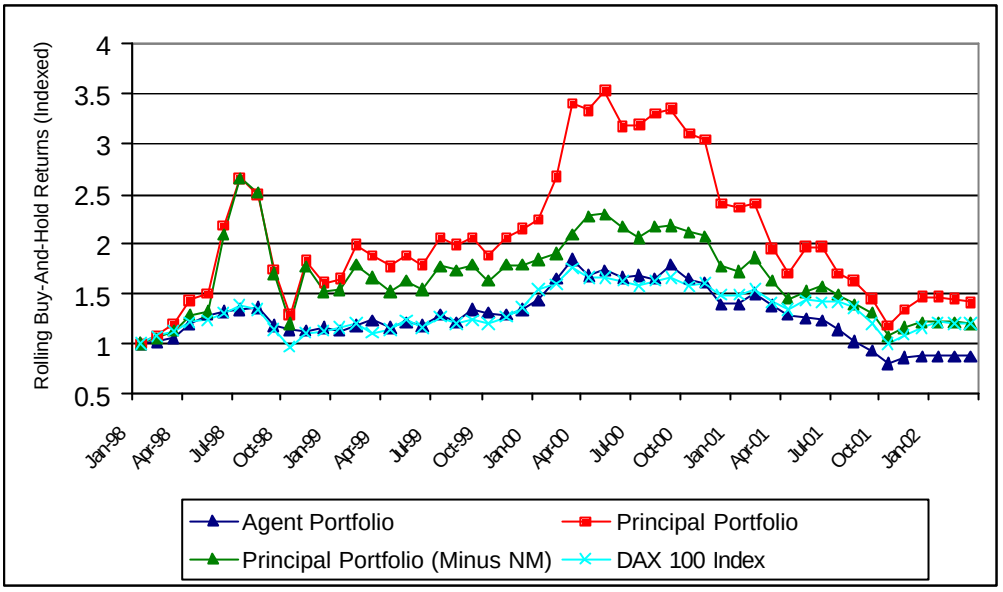
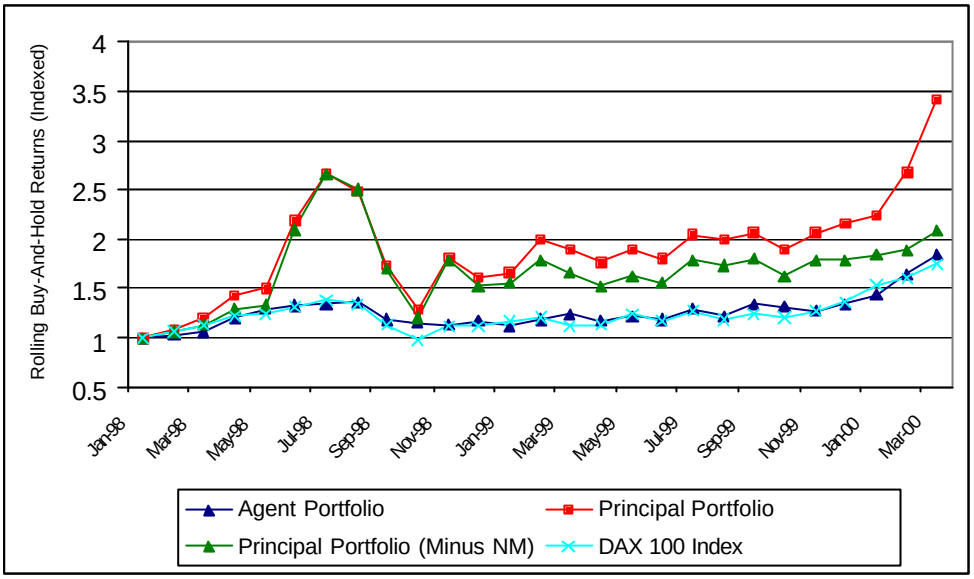
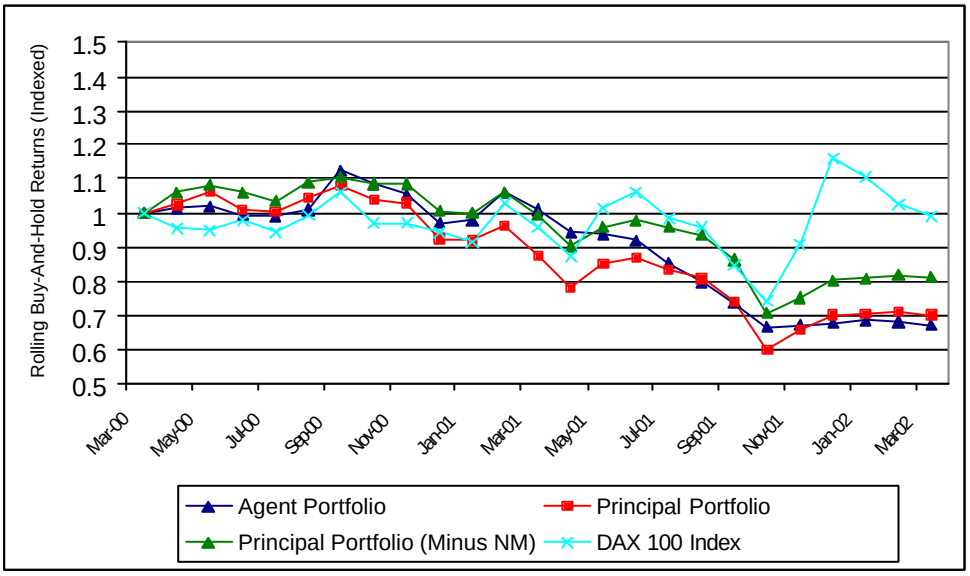


Figure 9: Rolling buy-and-hold returns over subperiods

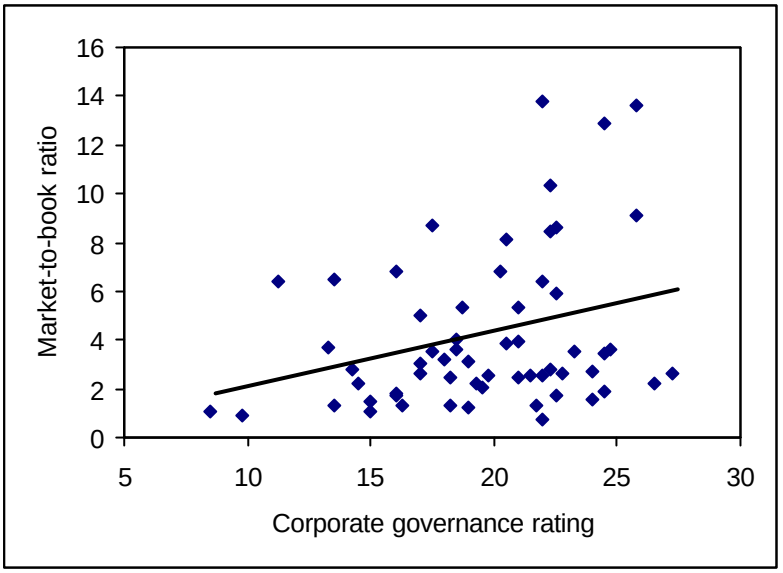


Bull market (1/98 - 3/00)



Bear market (4/00 – 3/02)

Figure 10: Corporate governance rating and market-to-book ratio



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