Accounting of German Stock Companies – Regimes and Their Effects on the German Stock Market

Introduction

For more than a century, Germany's codification of the details of external reporting for stock companies has been regulated by the Reichstag, the predecessor of the Bundestag. The Reichstag brought to stock companies a century of quite stable and conservative accounting rules. Over time, the degree of conservatism has diminished due to different interpretations of the code as well as legal changes in the years of 1937, 1965 and of 1985. The 1985 rules involved most of the German rules becoming a part of European law. The basic valuation principles were preserved within the European context, with historic cost as the maximum basis for asset measurement and as the minimum basis for debt measurement. Apart from additional disclosure requirements, only the amount of allowable future provisioning has been reduced.

This situation changed from 1992 on, when increasing numbers of stock companies began to voluntarily prepare – additional to their financial statements according to German law (HGB) – a second set of financial statements prepared according to either US Generally Accepted Accounting Principles (US GAAP) or International Financial Reporting Standards (IFRS) encompassing their predecessor International Accounting Standards (IAS). For convenience, both sets of international standards are referred to as IFRS throughout this chapter. Also, the German stock exchange has introduced for stock companies of the former so called *Neuer Markt*, a subset of the *Geregelter Markt*, the obligation to disclose financial statements according to US GAAP or to IFRS in addition to European/German regulation (HGB) statements.[1] The Commercial Code was modified in 1998 so that stock companies were generally allowed to apply any internationally accepted accounting regime instead of HGB for the preparation of their consolidated financial statements. This was not allowed for non-consolidated financial statements. The modification of the code preceded a European Union regulation which required stock market companies to apply IFRS for consolidated statements from 1 January 2005.

It is interesting to picture the fiscal year 2002, prior to the requirement to adopt IFRS. Seven hundred and thirty stock companies have financial reports disclosed in Germany and have shares listed at one of the eight German stock exchanges: 133 of these reports follow US GAAP, 232 apply IFRS and 365 still apply HGB. The trend not to use HGB for consolidated financial statements is extremely strong among the large corporations. The stock market orientation of many German companies is accompanied by a preference of their managements for non-HGB financial statements. In the move to IFRS, the suspected lack of shareholder orientation of HGB statements is regarded as an important argument. In addition, it is contended that this presumed lack of shareholder orientation causes information which is inferior to IFRS or US GAAP information and therefore leads to a higher cost of capital than the information given under IFRS or US GAAP.[2]

What is the explanation for the regulatory requirement to adopt IFRS from 2005 on? Has it to do with the quality of the European/German regulations or with the image of these regulations? Is European based law less effective than other laws or standards? Have German companies been so discontent with their traditional HGB codification that they even accepted

the burden of accounting under two different regimes for a certain time span? Which of the claimed advantages of US GAAP or IFRS hold in reality? Are there disadvantages of these standards? Which of the supposed HGB disadvantages or advantages can be found in reality? Are, for Germans, the expected advantages of foreign and therefore less known regimes really higher than the disadvantages of the familiar German accounting laws? This chapter details an exploratory study contributing to addressing these questions.

It is consistent with theory that accounting delivers, in a world of incomplete markets under uncertainty, some of the information that shareholders need to make rational investment decisions. In particular, the financial reports governed by accounting regulations in national systems and in international standards generally aim to ensure that firms provide information useful to financial statement users who do not have the ability to demand specific purpose reports, and who have no direct influence on the management of a firm. Beaver (1998) explains in detail that, under such conditions, accounting based owners' equity, income, assets, debt, revenues and expenses are elements of the information needed by these shareholders.[3]

The assumption that shareholders use financial data for decision-making is especially important and requires that the information delivered is relevant and reliable. The information provided by management is relevant for shareholders if it allows them to learn something about future changes in the value of the company and about future dividends and capital flows. The information is reliable if the numbers are objective and do not depend on undisclosed views and management intentions. The basic question then is whether the different accounting regimes mentioned above vary in their relevance and reliability. Unfortunately, these two properties of financial reports often compete with each other.[4]

Within the international investment community, it is strongly believed that financial statements according to US GAAP or IFRS are relevant and reliable. This can be read in the introductory conceptual frameworks of these standards. The details of financial statements according to HGB, on the contrary, are widely unknown to this community. If at all, it is known that such statements are conservative and that the management of a German corporation has great discretion. It is often forgotten that the image of German accounting in the literature stems from times with different rules, which have long passed. So, at first glance, it is not clear for a non-German investor whether HGB statements are relevant or reliable. There is no primary source describing to investors the purpose of HGB accounting and no primary source which explains that HGB statements are relevant or reliable. For people accustomed to a common law country with its privately developed standards, it seems hard to understand that accounting rules are codified, and that this codification relies on some basic principles.

In addition, much of the literature on German accounting stresses the importance of creditor protection as one of the objectives of HGB.[5] From these descriptions, some authors conclude that investor protection is missing. Those who know the HGB rules would, however, doubt that such a view is caused by the quality of the rules. A far more natural explanation is that the international investment community consists mainly of people who have been brought up in common law countries without any codification of accounting and who therefore know much better how to interpret standards (US GAAP and IFRS) than reports which follow codified regulations. If a company wants to raise finance from this community, it has to present financial statements that this community understands. Up to now it has been largely unknown which of the three regimes delivers more relevant and more reliable numbers. However, many people from the investment industry regard either US GAAP or IFRS as preferable to HGB.

The content of financial statements varies according to the different regimes. One can expect that different sets of financial statements will provide different information for investors. If shareholders analyze the information and act always in the same way, one can also expect that the market properties of financial statements vary according to whether the statements are prepared using HGB, US GAAP or IFRS if these accounting regimes vary. In order to avoid such a variation by different sets of accounting rules, the US Securities and Exchange Commission (SEC) forces foreign companies whose shares are listed at a US stock exchange, to deliver their financial statements according to US GAAP or to present a reconciliation. The London stock exchange requires foreign companies to provide financial statements that follow IFRS. The internationally relatively unimportant role of the German capital market makes it understandable that German HGB is internationally not highly regarded for investment purposes. As at 2005, any of the three above mentioned sets of accounting information may be used in Germany for consolidated financial statements.

It is interesting that many German companies voluntarily moved to non-HGB accounting reports long before the European Union suggested such a change even though they did not plan to use a foreign capital market. Without additional research, it is not possible to establish definitely the reasons for this change. The hope of obtaining capital at a lower cost could be one reason. The expectation that management can present itself in a more positive way (with consequences for any income dependent remuneration) may be another. The chance to reduce the burden of any enforcement (Can German auditors really assure that US GAAP or IFRS have been applied correctly?) can be another reason. It is also interesting that *Deutsche Börse AG* prescribed financial statements according to US GAAP or IFRS for the relatively small companies at the *Neuer Markt*, without solid empirical evidence about the advantages of these regimes over HGB statements.

The superiority of US GAAP or IFRS accounting over HGB accounting for stock market information may be queried,[6] and it is not clear that US GAAP or IFRS accounting produce better stock market properties than the continental European HGB based accounting. Theoretically, it would undoubtedly be possible to find reasons for some standards to be regarded as superior to HGB rules, and *vice-versa*. It is mainly a question of the criteria applied. Overall, though, we have to accept that we do not know much about the effect of different accounting rules on the stock market. This is especially true if investors in different countries analyze financial data in different ways. Most studies to date rely only on small data sets of prior time periods, and the generalizability of the results is either limited or unclear.[7] In contrast to prior studies, this study uses nearly all German stock corporations and covers multiple years. The results are important to price taking shareholders and also relevant for the institutions that deal with regulation and standardization of accounting.

The rest of the chapter is organized as follows. The next section describes the limitations of HGB accounting relative to US GAAP and IFRS accounting. As the chapter seeks to demonstrate empirically that present HGB accounting is not necessarily as uninformative to investors as is generally thought, it is not necessary to describe theoretically the advantages of HGB accounting. The chapter then presents results from other studies before describing original and independent research conducted by the author and forming the basis for the tentative conclusions presented in the final section.

Limitations of HGB compared to US GAAP and IFRS

Accounting concepts: HGB versus US GAAP and IFRS

For managers as well as for shareholders, HGB accounting seems to have only limited attractiveness.[8] Four reasons are often mentioned: (1) the prudence principle, (2) the explicit discretion left to management in defining income, (3) the influence of tax law and (4) the lack of additional information which goes beyond balance sheet and income statement. The importance of the last reason has meanwhile been reduced for stock companies, as stock companies have been required by law to present a cash flow statement, a statement of owners' equity and a segment report since 1999. Nonetheless, if any or all of these four reasons are important, they are also reasons that could reduce the relevance of HGB statements for shareholders relative to statements according to other accounting regimes.[9]

The prudence principle of the German HGB implies the application of the realization principle as well as the anticipation of future expenses in the present period. In turn, the realization principle reflects worldwide the idea that revenues should be recognized when the enterprise delivers a work to a market partner. The definition and the interpretation of this principle are in contrast to the IFRS and US GAAP standards which reflect in present reports contracts which enclose a production that ends after the end of the present accounting period.[10] The treatment of such long term contracts is, however, not a question of the realization principle, but one of the treatment of future payments in the present income statement. It is a general question of whether future payments should be anticipated in the present period as revenues or expenses. It is often seen as a limitation of HGB accounting that future payments are only reflected if they relate to expenses, and that they are not reflected if they relate to revenues. HGB does not define any probability for future payments to be treated as expenses. This might lead to a reduction of comparability between the financial statements of different firms. It certainly leads to an asymmetrical definition of revenues and expenditures.[11] On the one hand, it is fair to say that excessive or inconsistent anticipation of future expense payments distorts the information content of financial statements and may lead to unintended or inappropriate stock pricing or outcomes of contracts based on accounting numbers. The same is true for the anticipation of future revenue payments. On the other hand, the quality of financial statements presumably rises if the possibilities to build and use these reserves are diminished.

The second reason for HGB criticisms refers to the discretionary items that enable management to influence the annual earnings number. The different possibilities offered in HGB to account for goodwill illustrate this. According to the German code, companies may either deduct goodwill immediately from owners' equity, depreciate it over four years or depreciate it over its useful life. It is generally argued that a regime which (explicitly) allows for high levels of discretion diminishes comparability between firms and over time. Thus, a regime like the German one with its (explicit) discretion will be regarded by shareholders as worse than a regime which does not explicitly offer discretion. Additionally, German HGB did not require, until 1998, statements other than the balance sheet and income statement, management's report included.[12] In this discussion it should, however, be mentioned that the German HGB allows for discretionary items mainly with respect to future expense payments which are anticipated in the current financial statements. US GAAP or IFRS do not offer such high levels of explicit discretion. However, given that US GAAP and IFRS standards (and IFRS standards in particular) refer, contrary to the codified accounting rules, to a few of many situations and problems, it is very probable that due to the incompleteness of standards

details there are areas without any standards that offer much discretion. This is, at least, the result of a detailed analysis of US investors of European/German companies.[13] Other chapters in this book address the extent to which each of these accounting regimes is rules based or principles based.

A close relation between tax accounting and financial accounting is also mentioned as a limitation of German HGB accounting. This relation may enable a valuation apt for tax purposes in disclosed financial statements. Originating at a time shortly after the First World War when tax rules were just developing in Germany, the principle of the dominance of HGB rules (*Maßgeblichkeitsprinzip der Handelsbilanz für die Steuerbilanz*) has still survived for cases when there are no tax rules. Today, sometimes tax rules require that for HGB statements the same valuation is chosen as for tax purposes (*umgekehrtes Maßgeblichkeitsprinzip*). This principle gives management an incentive to apply tax minimizing rules instead of stock market relevant rules. It should be mentioned, however, that tax rules have developed in a way that today there are only a few cases left when tax rules require values that are less than HGB values. It is important to note that this third reason only holds for unconsolidated legal entity financial statements which are the basis for taxation. Its importance is irrelevant for consolidated statements of the economic entity.

The final argument, concerned with a lack of information in excess of balance sheet and income statement, has, as described above, also lost its relevance in1998 with the requirement to prepare a Cash Flow Statement in 1999.

Overall, one has to admit that several reasons formally reduce the importance of German HGB accounting for shareholders, as compared to US GAAP or IFRS. On the other hand, the German accounting regime offers with its discretion and with its completeness a flexibility that the other regimes lack. One also has to question whether prudent income measurement that corrects for false expectations is better than an overly optimistic income measurement that possibly relies on wrong expectations. The critique concerned with HGB is very similar to the critique which could be attached to financial statements of other European countries, as Germany is subject to European regulation. A consideration of the US accounting scandals of the start of this century as well as the speed with which generally accepted US accounting principles concerning goodwill have been totally changed, create doubt about the assumed stock market superiority of US GAAP and IFRS accounting.

Studies on different accounting regimes in Germany

It should be stated from the outset that empirical research on the consequences of different accounting regimes for the stock market is quite rare in Germany, as compared to the studies using US data. Comparative studies of different accounting regimes including the HGB regulations are largely unknown.[14]

Most studies with German data reflect either old periods or a small data set. Some of the old analyses come to the conclusion that there is a big difference between German and US data, while others suggest similar results between Germany and the USA. More recent research concentrates on one fiscal year or on the very large stock companies. It is difficult to learn much from an analysis of prior research with German data about the different accounting regimes for an actual description of what is going on today. Therefore, this chapter abstains from a description of this research. The possibility to explore different accounting regimes in the same stock market still offers research possibilities. This chapter exploits one of these possibilities by using a large sample that reflects all segments of the German stock market.

Theoretical background

State-oriented approach

A stock market may be described by the prices paid for shares. It is possible to aggregate the share prices of a firm to variables that provide information about the whole market. We mainly think of parameters that describe the distribution of prices. One of the approaches for the measurement of the market properties of different accounting regimes is to look at these variables before and after a change in the applied regime. Such event studies assist in evaluating the relevance of the event. Problems always arise, however, when there are several events happening close to each other, or when not all events are reported.

Another approach for measuring the stock market properties of different accounting regimes is to distinguish between different market segments according to the accounting regimes used by firms. An analysis of differences between the distributions of share prices in the different segments might inform us about the relevance of the different regimes. Under such an approach events are less important. As we describe states instead of changes we could call this a state-oriented approach.

The central problem of both approaches is to control for factors with additional influences on the stock market or factors which are still unknown. An argument against event studies is the fact that they can only include firms which have experienced the event. There is no room for all those firms that have applied only one accounting regime, e.g., firms that did not change their accounting or new firms that applied but one regime. This paper concentrates on the state-oriented approach. However, it is recognized that there are likely to be omitted variables that adversely influence the results obtained under this approach. In particular, the main constraint upon interpreting the results from the study reported in the remainder of this chapter is the fact that it cannot control for the reasons why firms voluntarily use US GAAP or IFRS and the possibility that those reasons may be related to the capital market characteristics of the firms that are the focus of the study.

Hypotheses

The aim of this chapter is to challenge the widely held view that US GAAP and IFRS contrast with the HGB regime insofar as they better fulfil the needs of the stock market. We therefore undertake a state-oriented analysis comparing the stock market variables for HGB firms with those of US GAAP or IFRS firms.

A comparison of different distributions is normally undertaken by a comparison of the moments of the distributions. As we do not argue that the location parameter should vary and as we want to keep it simple, we compare the disturbance parameters of the three distributions. The null hypotheses tested are:

H_1: For the whole market as well as for each size segment (*Amtlicher Handel* versus *Neuer Markt*), the market variables are less risky for US GAAP or IFRS firms than for HGB firms.

H_2: For firms of the *Amtlicher Handel*, the market variables are less risky for US GAAP or IFRS firms than for HGB firms.

H_3: For firms of the *Neuer Markt*, the market variables are less risky for US GAAP or IFRS firms than for HGB firms.

Operationalizing the hypotheses

If possible, buyers find on a market a rich offer of diverse goods or services at fair prices and if the cost to participate in the market is low, they tend to fulfil their wishes on that market. Sellers of goods or services will meet their goals and go to the market (again) if they find there enough buyers for their goods or services and if the cost to participate in the market is low.

On markets for physical goods, the participants can generally evaluate the quality of the offered goods quite well. Therefore buyers and sellers can easily evaluate whether a price for a good is fair. In contrast, the qualitative properties of the goods offered on the stock market are not obvious. They depend mostly on expectations of future payments from a share, be it future dividends or payments from the sale of the share. Stock market participants have to rely to a great extent on the information provided by the firm, knowing that management will not always disclose everything correctly to other parties. Whether the ask price of the seller or the bid price of the buyer are regarded as fair depends, even in the absence of information asymmetry, on the way these expectations are built. It is generally assumed that in this situation accounting information is at least helpful. Theoretical and empirical research has shown that the ideas of the Capital Asset Pricing Model (CAPM) might be able to explain a part of reality.[15] Under that model the variance of the abnormal prices would be relevant.

The degree of volatility of prices on adjacent days might be seen as an indicator of the uncertainty of the market as to the correct value of shares. Greater volatility occurs because of greater uncertainty as to what constitutes a fair price. If the price volatility depends on the accounting regime, then this volatility can be used to evaluate the quality of different accounting regimes, *ceteris paribus*.

The difference between the bid and the ask prices also reflects uncertainty about the value of the shares. The greater the uncertainty, the greater is the dispersion of these prices. Again, if these prices depend on accounting information, they can be used to evaluate different accounting regimes, *ceteris paribus*.

We also test for the significance of the differences between different regimes. We apply a non-parametric Wilcoxon test. This test does not assume any special distribution of the variables. The statistics of this test, however, are approximately normally distributed numbers which can be evaluated by reference to the density function of a normal distribution.

1. Risk measured by the volatility of the prices (returns) of a security

Variation in the prices of a security over time shows that market participants have changed their expectations about the value of future payments related to the share. Such expectations variations may be induced by many causes, including a change in the attitudes towards risk or new information about value relevant events, e.g. information contained in accounting numbers. As far as events become known from accounting numbers, expectations may also be influenced by the type of reporting. A detailed, precise and reliable report presumably influences the expectations of the market participants differently from a report which allows for multiple interpretations. It seems safe to assume that the former informs shareholders better than a short, unclear and less reliable report. As a consequence, the volatility of prices should be smaller if the quality of accounting improves. We can therefore regard the standard deviation of prices of a share i, $s(P_i)$, as a measure for the quality of the firm's accounting.

The comparability of the prices of different securities is reduced as the securities might reflect totally different proportions of owners' equity. Therefore, we rely on returns

instead of on prices and on the volatility of returns instead of the volatility of prices and use the volatility of the return of a security as one of our measures.

The comparability of the share prices of different firms is also reduced if investors are oriented towards portfolios instead of single securities. For that case theory suggests examining abnormal prices as is done in the next section.

2. Risk measured by the volatility of residual prices (returns) of a security

It can be argued that the variance of the prices of a security as a measure for the quality of an accounting regime is also influenced by other variables than the accounting regime. One way to react to this argument is to apply the CAPM. This model regards the price of a share as a function of the market price per unit of risk and the number of risk units included in the share. Again, we examine returns instead of prices: the risk modified return of the share.

The empirical version of this model assumes that the residual return u_i of a share is taken out of the share's return, R_i, the market return, R_m, and the amount of firm specific risk, $ß_i$, that is systematically related to the market return:

$$R_i = R_f + ß_1 R_m + u_i$$

Corresponding to this model the variance of returns of a share may be separated into two parts:

$$Var(R_i) = ß_i^2 \, Var\,(R_m) + Var\,(u_i)$$

Correspondingly, the square root of these terms can be calculated in order to determine the corresponding standard deviations. Assuming the relevance of the CAPM, the dispersion of the residual returns, measured by its standard deviation, $s(u_i) = SQRT\,[Var\,(u_i)]$, may be seen as a measure for a revised risk of returns. The larger the uncertainty of a firm's future, the larger this unsystematic, $s(u_i)$, will be under the portfolio assumption.

This risk can be diminished by an investment in a portfolio of shares. The extent of reaction to overall market influences, the systematic risk $ß_i$ has nothing to do with the quality of an accounting regime.[16] We apply here the standard deviation of the residual returns of a share as a further measure for the volatility of that share. Again, we aggregate this variable over all shares of the different market segments for firms applying the same accounting model.

Finally, it should be mentioned that the volatility of residual returns depends on how the market return is measured and how the regression parameters are estimated. A linear regression approach is applied with the market return being measured by a market index. The greater the number of shares in market index, the nearer the index comes to the properties assumed by the CAPM.

3. Risk measured by the bid-ask spread

A difference in the prices of sellers and of buyers indicates that both parties have built different expectations. The information used by the parties has been interpreted differently, assuming that they have access to the same information.

Market participants will build their expectations with all information available to them. It is very probable that they rely on accounting information provided by the firm.[17] It is

then also probable that the accounting regime will influence the participants' expectations. Whether the accounting numbers are interpreted by the sellers and by the buyers in the same way may be seen from the difference between the bid and the ask prices. If the accounting numbers allow for different interpretations, a regime that produces more homogeneous interpretations is generally superior to a regime which produces heterogeneous expectations. The regime with less differences between bid and ask prices gives less possibilities for different interpretations and therefore seems to be superior.

If we assume asymmetric information among the market participants, well informed market participants can exploit those who are less informed.[18] This leads, as many theorists have shown, to disadvantageous consequences: the worse informed protect themselves by reducing their market activities.[19] The consequences are higher transaction costs, higher bid-ask spreads, and reduced liquidity of the market.[20] If, on the other hand, firms manage to improve public access to relevant information, transaction costs fall, the bid-ask spread declines, and higher liquidity might improve the access to capital for those firms.[21] If all firms follow such a strategy, one can assume an improvement of stock market properties.[22]

The bid-ask spread is an indicator of the transaction costs and of the liquidity of a share. The spread defines the cost which a market participant without superior information has to pay for an immediate transaction.[23] This spread provides a reasonable measure for evaluating accounting regimes and has been used for such purposes in prior research.[24]

To apply these approaches, it is necessary to estimate the difference between the prices or to know the bid price and the ask price from the order book of the stock exchange. The first approach is applied. The bid-ask spread using the Roll (1984) approach and for each share one price per firm per day is estimated. The estimate, *S*, which represents Roll's ideas, results from the covariance (cov) between the prices (*P*) at two adjacent points in time:

$$S = 2 \text{ SQRT } [-\text{cov } (P_t, P_{t-1})]$$

An equivalent expression on the basis of daily returns, *R*, is given by:

$$S = 200 \text{ SQRT } [-\text{cov } (R_t, R_{t-1})]$$

The simplicity of the formula is the main advantage of the estimate of the bid-ask spread. The only assumptions are that the share is traded in an information efficient market and that the probability distribution of the price changes is stationary during the estimation period. The disadvantage is that a negative covariance is needed so that the expression under the root becomes positive. Other things being equal the accounting regime with the lowest spread will be the best.

Control of other influences

The stock market data may differ not only in relation to accounting regimes but also according to other variables. For example, in the period of this study, many firms entered the stock market for the first time. These initial public offerings (IPOs) were often underpriced at the beginning of their listing,[25] and the effect is certainly independent of the accounting regime. To avoid the influence from such an event on the research, IPO firm-years are excluded from the sample.

Another situation in which the stock market is led by information other than the accounting regime is corporate insolvency. To avoid effects from this second event, data are excluded for firms in their last year before insolvency.

The effects mentioned reduce the usable observations. We also leave out years in which we have less than 200 data points for the annual regression and less than 50 records for the estimation of the spread.

The results presented have been tested for their robustness. Fiscal years shorter than 12 months are excluded, the estimation intervals for the variables were varied and the number of records left out for other reasons was varied. None of these variations seriously changed the results.

Empirical results

Data

We analyze the different accounting regimes which have been used in Germany between the fiscal years 1996 and 2002, each year beginning after July 1 and ending before June 30 of the next calendar year. The population includes 4993 financial reports of which 2615 can be used after deleting IPOs and other firm-years for reasons outlined above. These reports were analyzed according to the regime used. If the firm was organized as a group of companies with legally independent units we considered its consolidated statements. If it consisted of but one legal unit the unconsolidated statements were used. The regimes found were HGB, US GAAP and IFRS.

Before the existence of §292a HGB in 1998, non-HGB accounting was only possible additionally to HGB accounting. During this period several firms disclosed at the same time two sets of financial statements or parts thereof.[26] Some disclosed a full additional set (parallel set), others produced in addition a report which fulfils HGB and another accounting regime, and others produced a HGB report plus earnings and owners' equity in reconciliation. Following the existence of §292a HGB, many firms disclosed just one set of financial reports. Table 1 shows the distribution of reports produced.

Table 1
Accounting regimes applied by firms with shares listed on the *Amtlicher Handel* and on the *Neuer Markt*

Year	*Amtlicher Handel* without single HGB					*Neuer Markt* without single HGB					Single HGB	Total
	US GAAP	Parallel Report	Recon-ciled to US GAAP	Dual Report	Total US-GAAP	IFRS	Parallel Report	Recon-ciled to IFRS	Dual Report	Total IFRS		
1996	1	1	3	-	5	-	4	-	5	9	540	554
	0.18%	0.18%	0.54%		0.90%		0.72%		0.90%	1.62%	97.47%	100%
1997	3	3	4	-	10	3	7	-	8	18	542	570
	0.53%	0.53%	0.70%		1.75%	0.53%	1.23%		1.40%	3.16%	95.09%	100%
1998	16	6	10	1	33	35	6	3	6	50	535	618
	2.59%	0.97%	1.62%	0.16%	5.34%	5.66%	0.97%	0.49%	0.97%	8.09%	86.57%	100%
1999	68	8	17	2	95	114	12	9	2	137	524	756
	8.99%	1.06%	2.25%	0.26%	12.57%	15.08%	1.59%	1.19%	0.26%	18.12%	69.31%	100%
2000	136	2	23	1	162	213	9	4	-	226	524	912
	14.91%	0.22%	2.52%	0.11%	17.76%	23.36%	0.99%	0.44%		24.78%	57.46%	100%
2001	149	1	8	1	159	224	10	1	-	235	459	853
	17.47%	0.12%	0.94%	0.12%	18.64%	26.26%	1.17%	0.12%		27.55%	53.81%	100%

2002	125	2	4	2	133	227	4	1	-	232	365	730
	17.12%	0.27%	0.55%	0.27%	18.22%	31.10%	0.55%	0.14%		31.78%	50.00%	100%
All	498	23	69	7	597	816	52	18	21	907	3489	4993
Years	9.97%	0.46%	1.38%	0.14%	11.94%	16.34%	1.04%	0.36%	0.42%	18.17%	69.88%	100%

We distinguish between the shares traded in the *Amtlicher Handel* and in the *Neuer Markt*. A further distinction is made according to the type of information. Firms that disclose only HGB financial statements are distinguished from firms that disclose two sets of financial statements (HGB plus US GAAP or HGB plus IFRS). This group includes reconciliations. The last group of firms discloses just one financial report according to US GAAP or to IFRS.

The data stem from two sources. Stock prices and index returns have been taken from the *Deutsche Finanzdatenbank*.[27] The accounting data have been hand collected from the individual firms' reports.

Calculation of variables

We calculate the return volatilities and bid-ask spreads of stock market variables for each financial report using data from the *Deutsche Finanzdatenbank*. Daily returns are calculated from share prices controlling for dividends and for price changes due to capital contributions at other than market prices as well as predominant rights. The standard deviations of the returns and of the residual returns are calculated with reference to the fiscal year of each firm. The calculation of our yearly data begins three months after the beginning of the fiscal year and ends three months after the end of the fiscal year. We thus hope to capture effects induced by accounting regimes since annual reports are generally published within three months of the fiscal year-end.

The calculation of the residual returns requires knowledge of a market index. This index should represent the stock market, and its returns should be consistent with the security returns. The *Dafox Index*, a performance index on the basis of the capital invested in *Amtlicher Handel* of the Frankfurt stock exchange, seems to fulfil this requirement.[28]

The calculation of the bid-ask spread requires a short time interval. We use a three month period, ending the third month after fiscal year end. Roll's method requires that the expression underneath the square root is positive, which is not always the case. As it does not make sense to aggregate over senseless numbers, we exclude bid-ask spreads where the sign of the expression is negative.

It can be expected that the value of the stock market risk variables varies with the size of the firms. While many large firms often produce and trade mature products, small firms are likely to be still growing and investors are confronted with higher estimation uncertainty.

The numbers in Table 2 are the starting point for the research. They represent the stock market values for years and for size segments without any reflection of the accounting regime used. The rows for the years show that there is a significant difference for firms traded in the *Amtlicher Handel* and in the *Neuer Markt*. The numbers for the *Amtlicher Handel* as well as those for the *Neuer Markt* vary from the average for all firms. The numbers for *Amtlicher Handel* firms are much smaller than those for *Neuer Markt* firms. This is true for all three variables and all years.

We commence by examining the distribution over all years. The mean (median) of the variance of security returns of all companies was 3.15 (2.68). As we expect, the mean and the median for firms whose shares are traded in the *Amtlicher Handel* (2.40; 2.19) are significantly smaller than those of firms whose shares are traded on the *Neuer Markt* (5.59; 5.29). This is consistent with the prediction that there is a higher risk with estimating the future returns of growth firms.

A similar relation is true for the variances of the residual returns. While all companies reflect a mean (median) of 3.03 (2.61), firms of the *Amtlicher Handel* show 2.32 (2.11), and firms of the *Neuer Markt* show significantly higher values of 5.34 (5.04).

The same is true for the parameter *S* of the bid-ask spread. All firms have a mean (median) of 0.22 (0.71), while statistics for firms listed on the *Amtlicher Handel* show 0.40

Table 2
Stock market variables ordered according to market segments and time

	All firms				*Amtlicher Handel* firms				*Neuer Markt* firms				Significance of difference between *Amtlicher Handel* and *Neuer Markt*
	N	Mean	Median	Volatility	N	Mean	Median	Volatility	N	Mean	Median	Volatility	Wilcoxon Z
Year 1996													
$s(R_i)$	257	1.68	1.50	0.85	257	1.68	1.50	0.85					
$s(u_i)$	257	1.64	1.48	0.86	257	1.64	1.48	0.86					
S	257	-0.26	-0.44	1.27	257	-0.26	-0.44	1.27					
Year 1997													
$s(R_i)$	263	2.03	2.00	0.79	261	2.02	2.00	0.79	2	3.04	3.04	0.18	2.04
$s(u_i)$	263	1.91	1.83	0.78	261	1.90	1.82	0.78	2	2.91	2.91	0.16	2.01
S	263	0.03	0.30	1.36	261	0.03	0.30	1.36	2	-0.39	-0.39	2.29	-0.29
Year 1998													
$s(R_i)$	289	2.54	2.43	1.22	275	2.43	2.38	1.11	14	4.83	4.89	1.09	5.74
$s(u_i)$	289	2.51	2.38	1.21	275	2.39	2.33	1.10	14	4.74	4.70	1.10	5.70
S	289	0.09	0.30	1.77	275	0.04	0.39	1.68	14	-1.15	1.55	2.98	-1.59
Year 1999													
$s(R_i)$	350	2.71	2.48	1.34	298	2.42	2.27	1.16	52	4.39	4.45	1.01	9.60
$s(u_i)$	350	2.65	2.41	1.30	298	2.38	2.20	1.16	52	4.21	4.23	0.98	9.42
S	350	0.48	0.87	1.93	298	0.53	0.86	1.84	52	0.21	1.13	2.36	0.22
Year 2000													
s(Ri)	467	3.47	2.90	1.90	323	2.51	2.34	1.15	144	5.62	5.47	1.45	15.58
s(ui)	467	3.36	2.86	1.79	323	2.47	2.32	1.12	144	5.35	5.19	1.36	15.45
S	467	0.27	0.93	2.38	323	0.69	1.02	1.73	144	-0.70	-0.92	3.22	-3.43
Year 2001													
$s(R_i)$	534	3.97	3.45	2.22	315	2.58	2.32	1.20	219	5.97	5.76	1.79	17.68
$s(u_i)$	534	3.79	3.33	2.14	315	2.48	2.21	1.18	219	5.66	5.41	1.78	17.40
S	534	-0.00	0.39	2.69	315	0.34	0.76	1.85	219	-0.50	-1.46	3.52	-3.40
Year 2002													
$s(R_i)$	455	4.06	3.68	2.38	269	3.04	2.66	1.73	186	5.54	4.95	2.41	13.10
$s(u_i)$	455	3.88	3.37	2.36	269	2.87	2.43	1.73	186	5.34	4.68	2.40	13.11
S	455	0.84	1.12	2.82	269	0.57	0.81	2.23	186	1.23	1.99	3.47	3.60
All Years													
$s(R_i)$	2615	3.15	2.68	1.97	1998	2.40	2.19	1.24	617	5.59	5.29	1.92	33.45
$s(u_i)$	2615	3.03	2.61	1.90	1998	2.32	2.11	1.22	617	5.34	5.04	1.89	33.13
S	2615	0.22	0.71	2.37	1998	0.40	0.58	1.97	617	0.02	0.75	3.43	-0.50

$s(R_i)$ = Volatility of returns of share i; $s(u_i)$ = Volatility of residual returns of share i; S = Bid-ask spread (Roll); N = Number of observations

(0.58) and 0.02 (0.75) for firms listed on the *Neuer Markt*. Additionally, we notice that the parameters of the bid-ask spread are higher for firms of the *Neuer Markt* than for those on the *Amtlicher Handel*; the volatility relation for *S* being 3.43 > 1.97. It is very plausible that firms on the *Neuer Markt* have a less homogeneous bid-ask spread than companies on the *Amtlicher Handel*.

The distributions for individual years yield similar results. Additionally we find that the values of the variables grow from year to year. This might be a consequence of the whole market, e.g., a consequence of a growing risk of estimation. Less clear is, however, the development of the value *S* of the bid-ask spread in 1997 and in 1999. For the rest of the data all the differences are significantly different from zero.

Results

1. Results for hypothesis H_1

Hypothesis H_1 predicts, that market variables indicate less riskiness for US GAAP and IFRS than for HGB reports. The results relating to hypothesis H_1 appear in Table 3.

Independent of the different size segments, there is clearly variation across the accounting regimes. Across all years, the values of the mean (median) for HGB firms are 2.35 (2.13) and 4.50 (4.26) for IFRS or US GAAP firms, which are different from the values in Table 2 (3.15 (2.68) in each case). More importantly, the values for HGB firms differ significantly from the values for IFRS firms. However, contrary to Hypothesis H_1, over all years the values for firms using HGB accounting have the lowest volatility of residual returns. The volatility of residual returns for HGB firms (3.03, 2.08) is also lower than for IFRS and US GAAP firms (4.27, 4.06). Also this difference is statistically significantly different from zero. While the bid-ask spread mean is higher for HGB firms relative to IFRS or US GAAP firms only (0.28 compared with 0.16), the median and standard deviation are lower (0.56 and 1.81 compared with 0.77 and 2.92). Overall, these statistics indicate higher risk levels for those firms using IFRS or US GAAP. The number of firms providing two sets of reports, reconciliations, or dual reports is very small compared to the other groups. We therefore abstain from interpreting the results. Except for the bid-ask spread, most numbers are statistically significantly different from their counterpart of a different regime. For the bid-ask spread the differences are less significant.

The yearly analyses show very similar results for the return and residual return variables. It is possible to interpret Table 3 as contradicting H_1, although the results from the interpretation of the bid-ask spread, *S*, are not quite as clear. This result, however, cannot be regarded as a sign of the general superiority of HGB accounting. It might be that the results vary for different size segments. Again, it is noticed that the values rise continuously between 1996 and 2002 for all types of accounting regime used. Alternatively, it is possible that there are important omitted variables that determine (a) the levels of the firm risk and (b) whether the firms use HGB only, IFRS or US GAAP, or a combination of both. For example, if firms with high growth options are more likely to seek funding on international markets, or at least to seek international funding via a German stock market, we would expect to see results similar to those reported in Table 3.

The results might be misleading as many IFRS or US GAAP firms have their shares traded on the *Neuer Markt*. Firms in this segment often have, according to the above

discussion, properties that induce higher risk related values of the variables, e.g., dynamic markets, start-up status, little historical information. In the next section an analysis of the distribution of the variables separately for the different market segments is presented.

Table 3

Risk profiles of firms ordered according to accounting regime and time with levels of significance of differences between groups

	Group G1 HGB report only				Group G2 Two reports, reconciliations, dual reports				Group G3 IFRS/IAS or US-GAAP report only				Significance (Wilcoxon)		
	N	Mean	Median	Volatility	N	Mean	Median	Volatility	N	Mean	Median	Volatility	G1 vs. G2	G1 vs. G3	G2 vs. G3
Year 1996															
$s(R_i)$	252	1.68	1.51	0.86	5	1.42	1.14	0.48							
$s(u_i)$	252	1.65	1.48	0.87	5	1.26	1.08	0.52							
S	252	-0.27	-0.46	1.28	5	0.25	0.32	0.36							
Year 1997															
$s(R_i)$	251	2.03	2.00	0.81	10	1.97	1.98	0.29	2	2.35	2.35	0.39			*
$s(u_i)$	251	1.92	1.83	0.80	10	1.60	1.54	0.30	2	2.21	2.21	0.51			
S	251	0.02	-0.30	1.38	10	0.02	0.05	0.72	2	1.16	1.10	0.56			
Year 1998															
$s(R_i)$	250	2.42	2.29	1.18	13	3.40	3.05	1.31	26	3.26	2.81	1.15	***	***	
$s(u_i)$	250	2.39	2.25	1.18	13	3.34	2.97	1.30	26	3.19	2.80	1.11	***	***	
S	250	-0.09	0.29	1.75	13	-0.68	-0.74	2.06	26	0.18	0.86	1.85			
Year 1999															
$s(R_i)$	245	2.47	2.27	1.28	14	3.47	3.43	1.13	91	3.26	2.84	1.32	***	***	
$s(u_i)$	245	2.45	2.23	1.27	14	3.27	3.44	1.21	91	3.10	2.78	1.29	***	***	
S	245	0.50	0.84	1.94	14	1.16	1.29	1.77	91	0.35	0.92	1.90			
Year 2000															
$s(R_i)$	244	2.52	2.35	1.22	24	4.43	4.08	1.67	199	4.52	4.65	2.01	***	***	
$s(u_i)$	244	2.50	2.34	1.20	24	4.20	4.05	1.64	199	4.32	4.38	1.88	***	***	
S	244	0.82	1.12	1.80	24	-0.56	-0.12	2.38	199	-0.31	0.36	2.80	***	***	
Year 2001															
$s(R_i)$	213	2.56	2.26	1.31	11	4.68	4.49	2.15	310	4.92	4.82	2.22	***	***	
$s(u_i)$	213	2.51	2.25	1.28	11	4.32	3.94	2.20	310	4.64	4.51	2.18	***	***	
S	213	0.43	0.77	1.86	11	-0.90	-1.49	2.87	310	-0.27	-0.50	3.10	**	***	
Year 2002															
$s(R_i)$	153	3.10	2.46	2.07	8	3.92	4.04	1.66	294	4.56	4.16	2.39		***	
$s(u_i)$	153	3.05	2.44	2.05	8	3.67	3.72	1.79	294	4.32	3.99	2.41		***	
S	153	0.82	0.96	2.45	8	0.30	-0.79	2.01	294	0.87	1.30	3.01			
All Years															
$s(R_i)$	1608	2.35	2.13	1.30	85	3.63	3.29	1.73	922	4.50	4.26	2.19	***	***	***
$s(u_i)$	1608	3.03	2.08	1.90	85	3.41	2.97	1.73	922	4.27	4.06	2.15	***	***	***
S	1608	0.28	0.56	1.81	85	-0.13	0.40	2.12	922	0.16	0.77	2.92			

$s(R_i)$ = Volatility of returns of share i; $s(u_i)$ = Volatility of residual returns of share i; S = Bid-ask spread (Roll); N = Number of observations *, ** and *** expressing significance at the 10%, 5% and 1% level or higher respectively

2. Results for hypothesis H_2

Hypothesis H_2 predicts that for shares traded on the *Amtlicher Handel,* market variables indicate that US GAAP and IFRS are less risky than HGB reports. The association between firms' risk profiles and their chosen reporting regime for that group of firms are analyzed in Table 4.

As in Table 3, Table 4 indicates that of the returns and residual returns results are, on average over all years, lower for HGB firms than for firms that prepare IFRS or US GAAP reports. This is inconsistent with H_2 which predicts that for companies in the *Amtlicher Handel* the market variables are less risky for IFRS and US GAAP firms than for HGB firms. However, this difference is statistically significant only for the difference between HGB only firms and non-HGB only firms.

The yearly results are even less clear. They do not hold for every year, and there is considerable variation between the relative high/low measures for mean and medians of returns volatility and residual returns volatility. From 1999 on, there is only a small difference between the measures for those firms that disclose a US GAAP of IFRS report and those that provide only HGB reports. Table 4 indicates that the differences are generally not significantly different from zero.

With respect to the bid-ask spread, S, each year row in Table 4 reveals differences between the accounting regimes. Yearly results show that the difference between HGB and IFRS firms has switched direction since 2000, when the HGB firms started to have higher spreads. From 1999 onwards, we observe smaller values for IFRS and US GAAP firms than for HGB firms, for the residual returns variable (consistently) and sometimes for the overall returns variable, as well as for the bid-ask spread, S. In 2000, for example, the volatility of returns (residual returns) of HGB firms is 2.52 (2.50) and slightly higher than the volatility for the returns (residual returns) of firms using IFRS or US GAAP with 2.44 (2.38). The mean (median) of the bid-ask spread, S, for HGB firms (0.43 (1.12)) exceeds that of the other group (0.35 (0.78)). These differences are, however, statistically significant only in a few cases.

3. Results for hypothesis H_3

Hypothesis H_3 deals with the prediction about advantage of US GAAP and IFRS compared to HGB on the *Neuer Markt.* Hypotheses H_3 is analyzed in Table 5.

This table commences in 1997 as the *Neuer Markt* was opened in March 1997. Given the very small number of firms using HGB, it is not possible to meaningfully analyze HGB firms for individual years. On average over all years, the results are similar to those reported in the previous tables: The results for returns and residual returns are very similar across the market segments. Only one of the means, medians or variances of the overall analysis are significantly different from each other. The same holds for yearly analyses.

This can be interpreted in the sense that on the *Neuer Markt* there is no statistical evidence that the choice for an accounting regime is of any importance. Further analyses is therefore not conducted.

Table 4

Risk profiles of firms with shares traded on the *Amtlicher Handel* ordered by accounting regime and time with levels of significance between groups

	Group G1 HGB report only				Group G2 Two reports, reconciliations, dual reports				Group G3 IFRS/IAS or US-GAAP report only				Significance (Wilcoxon)		
	N	Mean	Median	Volatility	N	Mean	Median	Volatility	N	Mean	Median	Volatility	G1 vs. G2	G1 vs. G3	G2 vs. G3
Year 1996															
$s(R_i)$	252	1.68	1.51	0.86	5	1.42	1.14	0.48							
$s(u_i)$	252	1.65	1.48	0.87	5	1.26	1.08	0.52							
S	252	-0.27	-0.46	1.28	5	0.25	0.32	0.36							
Year 1997															
$s(R_i)$	249	2.02	1.99	0.80	10	1.97	1.98	0.29	2	2.35	2.35	0.39			
$s(u_i)$	249	1.91	1.83	0.80	10	1.60	1.54	0.30	2	2.21	2.21	0.51			
S	249	0.02	0.30	1.38	10	0.02	0.05	0.72	2	1.16	1.16	0.56			*
Year 1998															
$s(R_i)$	245	2.38	2.27	1.14	10	2.87	2.69	0.66	20	2.75	2.70	0.67	*	**	
$s(u_i)$	245	2.35	2.20	1.14	10	2.81	2.67	0.66	20	2.70	2.66	0.66	*	**	
S	245	-0.08	0.30	1.71	10	-0.14	-0.15	1.35	20	0.46	1.08	1.48			
Year 1999															
$s(R_i)$	242	2.44	2.24	1.25	8	2.81	2.82	0.78	48	2.29	2.20	0.64			**
$s(u_i)$	242	2.41	2.22	1.24	8	2.62	2.48	0.85	48	2.16	2.06	0.64			
S	242	0.49	0.83	1.94	8	0.88	1.29	1.80	48	0.70	0.91	1.24			
Year 2000															
$s(R_i)$	244	2.52	2.35	1.22	8	2.91	3.01	0.76	71	2.44	2.27	0.91			
$s(u_i)$	244	2.50	2.34	1.20	8	2.61	2.36	0.75	71	2.38	2.17	0.86			
S	244	0.43	1.12	1.86	8	0.01	0.79	1.37	71	0.35	0.78	1.41	*	**	
Year 2001															
$s(R_i)$	213	2.56	2.26	1.31	4	2.40	2.41	0.61	98	2.64	2.44	0.94			
$s(u_i)$	213	2.51	2.25	1.28	4	2.04	1.95	0.63	98	2.44	2.14	0.94			
S	213	0.43	0.77	1.86	4	0.53	0.59	1.78	98	0.14	0.69	1.83			
Year 2002															
$s(R_i)$	151	3.06	2.44	2.04	4	2.89	2.20	1.40	67	3.01	2.91	1.21	*		
$s(u_i)$	151	3.01	2.44	2.02	4	2.65	2.18	1.56	67	2.70	2.41	1.23			
S	151	0.79	0.96	2.46	4	0.96	1.38	1.30	67	0.26	0.55	1.88	*		
All Years															
$s(R_i)$	1596	2.33	2.12	1.28	49	2.50	2.34	0.84	353	2.68	2.49	1.02	**	***	
$s(u_i)$	1596	2.29	2.07	1.27	49	2.27	2.13	0.90	353	2.49	2.31	1.00		***	
S	1596	0.28	0.56	1.80	49	0.27	0.49	1.29	353	0.32	0.77	1.68			

$s(R_i)$ = Volatility of returns of share i; $s(u_i)$ = Volatility of residual returns of share i; S = Bid-ask spread (Roll); N = Number of observations *, ** and *** expressing significance at the 10%, 5% and 1% level or higher respectively

Table 5

Risk profiles for firms whose shares are traded on the *Neuer Markt* ordered by accounting regime and time with levels of significance between groups

	Group 1 HGB report only				Group 2 Two reports, reconciliations, dual reports				Group 3 IFRS/IAS or US-GAAP report only				Significance (Wilcoxon)		
	N	Mean	Median	Volatility	N	Mean	Median	Volatility	N	Mean	Median	Volatility	G1 vs. G2	G1 vs. G3	G2 vs. G3
Year 1997															
$s(R_i)$	2	3.04	3.04	0.18											
$s(u_i)$	2	2.91	2.91	0.16											
S	2	-0.39	-0.39	2.29											
Year 1998															
$s(R_i)$	5	4.48	3.91	1.42	3	5.17	5.70	1.51	6	4.96	4.93	0.60			
$s(u_i)$	5	4.44	3.92	1.46	3	5.11	5.66	1.48	6	4.82	4.70	0.63			
S	5	-0.81	-1.24	3.52	3	-2.47	-3.10	3.31	6	-0.76	-1.54	2.72			
Year 1999															
$s(R_i)$	3	5.16	4.77	0.97	6	4.36	4.39	0.90	43	4.34	4.31	1.02			
$s(u_i)$	3	5.12	4.72	1.02	6	4.18	4.14	0.79	43	4.15	4.15	0.99		*	
S	3	1.19	2.06	2.16	6	1.53	1.37	1.84	43	-0.04	1.08	2.40			
Year 2000															
$s(R_i)$					16	5.19	4.79	1.48	128	5.67	5.49	1.44			
$s(u_i)$					16	4.99	4.59	1.36	128	5.39	5.20	1.36			
S					16	-0.85	-1.44	2.75	128	-0.68	-0.87	3.28			
Year 2001															
$s(R_i)$					7	5.98	6.26	1.44	212	5.97	5.74	1.81			
$s(u_i)$					7	5.63	6.04	1.54	212	5.67	5.40	1.79			
S					7	-1.71	-2.60	3.17	212	-0.46	-1.35	3.53			
Year 2002															
$s(R_i)$	2	6.32	6.32	2.32	4	4.95	4.92	1.28	180	5.55	4.95	2.43			
$s(u_i)$	2	6.17	6.17	2.12	4	4.69	4.71	1.51	180	5.34	4.68	2.42			
S	2	2.91	2.91	0.44	4	-0.20	0.04	2.62	180	1.25	1.99	3.50			
All Years															
$s(R_i)$	12	4.72	4.56	1.57	36	5.18	5.14	1.39	569	5.63	5.33	1.95			
$s(u_i)$	12	4.64	4.52	1.56	36	4.96	4.80	1.35	569	5.38	5.08	1.92			
S	12	0.38	1.59	2.82	36	-0.68	1.40	2.83	569	0.06	0.87	3.47			

$s(R_i)$ = Volatility of returns of share i; $s(u_i)$ = Volatility of residual returns of share i; S = Bid-ask spread (Roll); N = Number of observations *, ** and *** expressing significance at the 10%, 5% and 1% level or higher respectively

Conclusion

Since 1996, many German firms have applied accounting systems other than, or in addition to, HGB to produce their consolidated financial reports. The number of German firms applying US GAAP or IFRS is growing. From the fiscal year 2005 on, the European Union requires firms to apply IFRS. The arguments for moving towards IFRS (and formerly US GAAP) were mounted in terms of the better stock market properties produced by these standards. Whether this motivation holds in reality, has been only scarcely investigated. The present research delivers some empirical results as part of an exploratory study.

To assess the truth of statements that adopting IFRS or US GAAP would increase the information content of financial statements, this research investigates whether market risk profiles were higher for HGB firms or for firms that reported using IFRS or US GAAP. If the information content of one set of annual reports was higher, then there would be less volatility in the returns, residual returns, and smaller bid-ask spreads for the more informative reports, *ceteris paribus*. However, the evidence does not support the primary hypothesis, that the risk profiles would be lower for those firms using IFRS or US GAAP.

Further analysis of the results on the basis of German firms whose shares are listed on the *Amtlicher Handel* and on the *Neuer Markt* with respect to the volatility of returns, the volatility of residual returns and the bid-ask spread was conducted. The results suggest that the hypotheses, predicting higher market risk profiles for HGB firms, do not hold. Seen over all years the bid-ask spread is larger for firms using IFRS or US GAAP than for HGB accounting, and the other volatilities are also higher. Seen over individual years, the differences against HGB are generally declining.

The results are valuable to critical thinking about the suggested superiority of US GAAP or IFRS accounting over HGB accounting. However, it has to be acknowledged that the research is not free from limitations. While much has been done to control influencing factors, there are undoubtedly other uncontrolled factors that might influence the volatilities and the bid-ask spread. Such factors should be included in future research in order to avoid misleading influences from this study. In particular, it would be valuable to investigate whether there are particular attributes of firms with high risk variance, residual risk variance, and bid-ask spreads that motivate those firms to seek international finance using IFRS or US GAAP reports. Future research could investigate, for example, the possibility that there are high growth firms that are more likely to be expanding into international markets. Reflection of differences in corporate governance might be another approach.

In conclusion, while this is an exploratory study, it does provide interesting evidence that conflicts with the widely held view that IFRS or US GAAP regimes provide information that is more useful to market participants in valuing equity.

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End Notes

1 The German stock have different trading for two groups of corporations. Firms whose shares are traded in the *Amtlicher Handel* have to fulfiull the normal disclosure requirements of the law. Corporations whose shares are traded in the *Geregelter Markt* are generally much smaller and they have to fulfill lower disclosure requirements than the companies whose shares are traded in the *Amtlicher Handel.* The *Neuer Markt* has been introduced at the Frankfurt stock exchange as a subset of the *Geregelter Markt*, with the special requirement of the stock exchange to disclose, in addition to legal requirements in Germany, financial reports which follow US GAAP or IFRS.

2 See the results of a query among German companies in Pellens et al. (1999), p. 203.

3 See Beaver (1998), especially chapter 4.

4 See Kieso et al. (2004), p. 31-33.

5 See Coenenberg (2001), p. 9-18.

6 See Esser (1998).

7 See Alford et al. (1993), Harris et al. (1994), Meitner et al. (2002), Leuz et al. (2000), or Leuz (2003).

8 See the results of a query by Förschle et al. (1995).

9 See Hüfner (2000).

10 See the Statement of Financial Accounting Concepts No. 5 for US GAAP, and IAS 11 for IFRS.

11 See Ball et al. (2000), p. 16-22 about the empirical relevance of this type of prudential accounting.

12 See d'Arcy (2000).
13 See Harris et al. (1994).
14 Exceptions to this statement are the works of Alford et al. (1993), Harris et al. (1994), Pellens et al. (1999) as well as Leuz et al. (2000) and Leuz (2003). In 2003 and 2004 three further studies of Möller et al. were published (2003a, 2003b, 2004).
15 See Möller et al. (2002).
16 See Auer (1998), p.142.
17 See Beaver (1998).
18 See Lev (1988).
19 See Akerlof (1970).
20 See Glosten et al. (1985) or Amihud et al. (1989).
21 For theoretical models of such effects as a consequence of voluntary reporting, see Diamond et al. (1991), Kim et al. (1994) or Baiman et al. (1996), and for an experimental study see Bloomfield et al. (2000).
22 Lev (1988), p. 16-19.
23 See Schmidt et al. (1991), p. 210-211, or Callahan et al. (1997).
24 Harrison (2000) overviews this literature.
25 See Langemann (2000) for an analysis of this observation as well as for an overview of results.
26 Hütten/Lorson (2000).
27 Bühler at al. (1993).
28 Göppl et al. (1993).