THE VALUE RELEVANCE OF ACCOUNTING DATA ACCORDING TO IFRS AND US GAAP: THE CASE OF GERMANY

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Abstract

This paper compares the value relevance of IFRS, US GAAP and national GAAP in a specific institutional setting. Using a sample of all listed firms in Germany which have voluntarily adopted IFRS or US GAAP we apply three different valuation models as well as a return model in our analysis. Whereas under IFRS and Germany GAAP book value of equity is relatively more value relevant than net income, we find a different result for US GAAP. Additionally, the results of our study suggest that IFRS accounting produces more value relevant data than HGB and US GAAP. However, the differences in the value relevance of the accounting systems are lower than expected.

Keywords: IFRS, US GAAP, IAS, HGB; value relevance; Germany

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1 Introduction

We investigate whether International Financial Reporting Standards (IFRS)[1] accounting data is associated with higher value relevance than non IFRS data. Using a large sample of firms listed at the German stock exchange we analyse the value relevance of earnings and of book values of equity prepared under IFRS, US GAAP and local German GAAP which are largely promulgated in the German Commercial Code (*Handelsgesetzbuch, HGB*) and thus are often called HGB. To investigate the ability of the accounting data to measure a company's value, represented by the market price of its stock and its performance represented by its stock return we apply four different models widely used in other value relevance studies. We find that the differences in value relevance between the accounting systems are low. However, IFRS seems to be the most robust accounting system performing well in all models applied, whereas HGB (US GAAP) performs well in the market value models (return model). Overall our results provide evidence that IFRS accounting produces more value relevant data than HGB and US GAAP.

The IFRS have become an accounting system which is now applied all over the world. Since the endorsement of the IFRS by the International Organization of Securities Commission (IOSCO) in May 2000, all major stock exchanges, except these in the USA, have accepted IFRS without reconciliations

for a listing. Moreover, according to the IAS regulation (1606/2002/EC) (with a few exceptions[2]) all publicly traded European companies are required to prepare consolidated accounts under the International Financial Reporting Standards (IFRS) from 2005 on. Other countries outside of the European Union require or at least allow the application of the IFRS (e.g. China or Australia).

The objective of the IFRS is to improve financial reporting by providing decision useful information to investors. To provide evidence on this statement our study investigates the value relevance of accounting data prepared under IFRS and under different accounting systems. Thereby, our study focuses on the German capital market where IFRS, US GAAP and HGB are applied by companies. An advantage of the focus on one capital market is that we control for institutional factors such as regulatory and listing requirements or the enforcement system. In contrast to cross-country studies, these factors cannot bias the findings as they are hold fixed. A limitation of this approach may be that the findings may not be representative for other countries (Barth et al., 2005). We elected Germany for our study for mainly two reasons. First, Germany is a country where companies had a option to apply IFRS, US GAAP or domestic GAAP providing a unique opportunity to compare these accounting systems. This option was provided by the Capital Raising Act (*Kapitalaufnahmeerleichterungsgesetz, KapAEG*) from 1998 until 2005 when the application of IFRS

became mandatory in Europe. Second, Germany has a specific institutional setting being a bank based financial system where information is mostly provided by internal channels to stakeholder groups and not by the financial statements and where (until 2005)[3] no external enforcement system was in place. In this setting we investigate the research question what impact an adoption of the investor-oriented accounting systems IFRS and US GAAP has on the on the value relevance of German companies' financial statements.

In contrast to prior studies, we have manually collected the type of the accounting system applied to ensure the quality of this decisive data. Moreover, we recognize that the model applied as well as the type of accounting data used in the analysis are decisive factors in evaluating the value relevance of accounting systems. We therefore add to prior literature by applying several different models to measure and compare the value relevance of the three accounting systems.

The remainder of the paper proceeds as follows. The next section provides a literature review of prior studies. In section 3 the research hypotheses are stated. Section 4 describes our empirical design including sample selection and methodology. In section 5 we present the descriptive statistics and the regression results of our study. The following section provides results from sensitivity analyses. The last section contains conclusions and limitations.

2 Literature review

Various studies have addressed the impact of the adoption of IFRS or US GAAP. Basically, three type of studies can be distinguished: (1) reconciliation studies, (2) capital market impact studies, and (3) accounting quality studies.

Concerning category (1), Moya and Oliveras (2006) examined the reconciliations of 14 companies of the stock market segment DAX and of two additional chemical and pharmaceutical companies for the period 1994-2001. They find that the impact of the initial adoption of IFRS on the net income and on retained earnings of these companies is statistically significant. The most important adjustments are increases in assets and reductions of provisions (except for pension liabilities). On average the equity increased after the adoption of IFRS, but the effect on net income was less obvious. Beckman et al. (2007) investigated reconciliations of 22 German companies between 1995 and 20002 and find HGB to be more conservative than IFRS or US GAAP in capitalizing and writing-off assets and in recognizing provisions. Additionally, they provide evidence that the reconciling items concerning write-offs and provisions are value relevant. Hung and Subramanyam (2007) investigate the reconciliations of 80 German first-time adopters of IFRS from 1998 to 2002. They document that earnings are less value relevant under IFRS than under HGB and that book values of equity are more value relevant under IFRS than under HGB. Moreover, the IFRS reconciliations are value relevant for book value. However, they find no value relevance for IFRS adjustments to earnings and no evidence for an improved relative value relevance of earnings and book value under IFRS.

The impact of an adoption of IFRS and US GAAP on the capital market is investigated by Leuz and Verrecchia (2000). Using a sample of 21 German companies they provide evidence that switching to an internationally accepted accounting regime leads to lower bid-ask spreads and higher share turnover but not to a lower share price volatility. Leuz (2003) analysed the information asymmetry of German New Market companies applying IFRS or US GAAP in terms of bid-ask spreads and share turnovers. No significant differences between these two accounting systems was found. Cuijpers and Buijink (2005) included German companies in a cross-country study of the determinants and consequences of a non-local GAAP adoption of European companies. Despite an increase of analyst following they were not able to document a positive effect of the adoption on the cost of capital, stock return volatility or analyst forecast dispersion. Gassen and Sellhorn (2006) find a slight decline in the information asymmetry after the adoption of IFRS measured by bid-ask spreads and percentage of trading days. However, the share price volatility increased significantly after the adoption. Barth et al. (2005) provide only weak evidence that firms face lower cost of capital after having changed from domestic accounting standards to IFRS. In contrast, Daske (2006) fails to confirm the notion that the application of IFRS or US GAAP by German companies entails lower expected costs of capital and even raises these costs during the transition period.

Previous accounting quality studies comparing IFRS, US GAAP and HGB find mixed results. On the one hand Barth et al. (2005) provide evidence for a cross-country sample that adopters of IFRS show an improvement in accounting quality, i.e. more value relevant information, less earnings management, and a more timely loss recognition. In another cross-country study Barth et al. (2006) find a lower accounting quality in terms of earnings smoothing, timely loss recognition and value relevance for companies applying IFRS than for companies applying US GAAP. For Germany, Bartov et al. (2005) find that accounting earnings based on IFRS are more value relevant for stock returns than HGB, but reveal lower value relevance than US GAAP earnings. On the other hand, Gassen and Sellhorn (2006) show that IFRS firms have less predictable and more conditional conservative earnings than firms applying HGB.

The results of other studies are inconclusive. Van Tendeloo and Vanstraelen (2005) and Goncharov (2005) both find no significant difference in the earnings management behavior of companies applying IFRS compared to those applying HGB. Van

der Meulen et al. (2007) find no significant difference between IFRS and US GAAP concerning various measures of accounting quality for a sample of companies from the German New Market.

To conclude, the results of prior empirical studies on the impact of the IFRS or US GAAP adoption are mixed. Reasons for this might be that cross-country studies are influenced by the different institutional structures in various countries (Ball et al., 2000). Therefore, we restrict our analyses to one country, i.e. Germany, which enables us to control for country-specific factors. Moreover, many studies (e.g., Bartov et al., 2005; Hung and Subramanyam, 2007) use rather small samples which might not be representative for the whole population of companies. Hence, in our study we focus on the entire sample of German listed companies. Moreover, we do not only examine the year of adopting the new accounting system like reconciliation studies but also the periods after an adoption. Additional problems of only focusing on adoption years are that the results might be biased because firms preparing for a change of accounting standards might gradually change local standards to avoid reconciling items (Lang et al., 2006) and that several options concerning the transition to IFRS might impair the results.

Similar to other value relevance studies we assume that investors focus on summary measures book value of equity and net income. Financial statements include much additional information, e.g. the composition of net income or the notes, which investors have public access to and may influence their considerations. However, as a study by the Deutsches Aktieninstitut (2005) shows, these disclosures are largely disregarded by German investors. Unlike other value relevance analyses (e.g. Bartov et al., 2005; Gassen and Sellhorn, 2006) we control for the impact of model specification on the results by using several value relevance specifications.

3 Hypotheses

We test the accounting quality of IFRS in comparison to HGB and US GAAP in terms of value relevance. The primary objective of the IFRS and US GAAP is to provide decision useful information to investors. In contrast, the German accounting system is regarded as stakeholder-oriented, conservative and closely related to tax accounting provisions (Harris et al., 1994; Haller and Walton, 2003; Black and White, 2003; Leuz and Wüstemann, 2004). Correspondingly, the German accounting system was found to have relatively low value relevance in several studies conducting cross country comparisons of the information content of accounting systems (Alford et al., 1993; Harris et al., 1994). However, one reason might be that the German institutional system includes features to privately inform key stakeholders about the performance of the company, in particular the stakeholders represented on the supervisory board

(for details see Schmidt, 2004; Mintz, 2006). In such an insider system a substantial amount of information is disseminated via private channels foreclosing the value relevance of data in financial statements (Harris et al., 1994; Leuz and Wüstemann, 2004). Our study examines the value relevance of different accounting systems in the same institutional framework which could control for these factors.

As value relevance we define the association of accounting data with market prices and with stock returns of companies. Thereby, we presume that a higher accounting quality implies a higher association between the accounting data and the market data. As a value relevance study is always a joint test of accounting data and of the model applied (Ashbaugh and Olsson, 2002), we use different models to examine and compare the value relevance of the different accounting systems investigated.

In developing our research hypothesis for the value relevance of book value of equity of the different accounting systems we consider the following major differences. The IFRS and US GAAP are more fair value oriented than HGB. For example according to the international accounting standards certain types of financial assets are measured at fair value whereas according to HGB no upward revaluation to fair value is allowed. Under IFRS even certain types of fixed assets (e.g. property, plant, and equipment as well as investment property) can be valued at fair value.

Moreover, when applying international standards more items which might be considered to be value relevant by investors are recognised in the balance sheet. E.g., under IFRS and US GAAP it is mandatory to recognise goodwill, whereas under HGB companies have an option to offset goodwill directly against retained earnings in the consolidated accounts. Furthermore, in contrast to HGB and US GAAP, IFRS allow the capitalization of development costs for self generated intangible assets. This might yield a greater value relevance of the book values of equity under IFRS than under HGB or US GAAP. Thus, we state the hypothesis that the value relevance of book values is higher under IFRS than under US GAAP and under HGB.

According to IFRS net income should be less biased by an immediate expensing of value relevant items, e.g. development costs, than under US GAAP and especially under HGB. Moreover, while revenues from construction contracts are recognized by applying the percentage of completion method according to IFRS and US GAAP, under HGB such revenues are basically not recognised before the goods or services have been finished. It could be assumed that revenue recognition according to the percentage of completion method reflects the performance of a company on a more timely basis than the recognition of revenues upon completion of the whole contract. Thus, we expect that the value relevance of net income to be higher under IFRS and US GAAP than under HGB.

We also compare the relative value relevance of book value of equity and net income. Institutional structures in Germany are still more relationship-based than in other countries focusing more on the long-term performance and the perpetuation of companies than on the maximisation of the year-by-year profit (Black and White, 2003). Net income only reflects the profit or loss for the last period, whereas book value of equity could be regarded as an indicator of the accumulated wealth of a company. Therefore, we expect that book value of equity is more value relevant than net income. However, it remains unclear if there are differences between the three examined accounting systems in this respect.

Finally, we investigate the combined value relevance of book values of equity and net income for the three accounting systems. Due to the aforementioned reasons and due to the fact, that IFRS and US GAAP in summary are more investor oriented and less influenced by taxes we hypothesize that the combined value relevance of net income with market values is higher for IFRS than for US GAAP and the latter has higher value relevance than HGB.

4 Empirical design

4.1 Data and sample selection

We obtain accounting and stock-return data from Thomson Financial Analytics – Worldscope. Returns are calculated from share price, number of shares and dividend data. The type of accounting system applied (IFRS, US GAAP or HGB) was manually collected from the annual reports of the companies as we found several missing entries or wrong classifications in Worldscope. We check if the summary of accounting policies in the notes of the financial statements and the auditors' opinion state a compliance of the financial statements with IFRS, US GAAP or HGB.

The initial sample consists of the firm years of German companies which were publicly listed at least for one year during the period from 1998 to 2004[4] at a German stock exchange and for which Worldscope provides data. Thus, we include also observations of firms which have been delisted in order to control for survivorship bias. We find 3463 observations with financial statements covering a 12-month period with a full set of accounting and share price and/or return data. To control for outliers, we deleted the top and bottom 1% of observations concerning market value of equity, book value of equity and net income. Moreover, observations with negative book value of equity were deleted. This excludes 312 firm year observations. Additionally, banks, investment and insurance companies as well as other financial institutions (representing 472 observations) are excluded as these companies are subject to specific accounting and reporting requirements. This reduces our sample to 2679 firm-year observations. Table 1 displays the distribution of observations by accounting system, by stock market index, and by year in which the fiscal period ended.

As can be seen from this table the application of IFRS increased from 13 companies in 1998 to 203 in 2004. In contrast, the application of US GAAP decreased after 2002. The major reason for this development is obviously the enactment of the IAS regulation described above.

< Table 1 >

To give an overview of the industry sector characteristics of the sample we use the industry classification of Thomson Financial. Thereby, the assignment of companies to 10 industries and 24 industry sectors depends on the product or service mainly provided by the company. Table 2, panel A shows the sample distribution by industries.

< Table 2 >

The distribution shows that IFRS and US GAAP are mainly used by technology companies, whereas for companies in basic industries (i.e. chemicals, forest products, steel, and other basic resources) HGB firm-year observations dominate. We control for these industry biases by using additional three industry and size matched samples for the comparison of the value relevance of the accounting systems (i.e. IFRS vs. HGB, US GAAP vs. HGB, and IFRS vs. US GAAP). Thereby, we match the number of firm-year observations of each industry sector in the samples. We select these firm-year observations in each industry sector class which have market value of common equity closest to each other. The resulting matched samples contain 617 (IFRS vs. HGB), 296 (US GAAP vs. HGB), and 454 (IFRS vs. US GAAP) firm-year observations. Table 2, panel B depicts the observations of the matched samples by industry.

Finally, we improved the control for industry and size effects by using data sets with observations of companies which changed the accounting system during the investigated period. Thereby, the number of firm-years before and after the adoption of IFRS or of US GAAP is matched. For these three adopters` samples (IFRS vs. HGB, US GAAP vs. HGB, IFRS vs. US GAAP) we compare value relevance for the adopting companies in the pre-adoption period to the post-adoption period. The industry distribution of the three adopters data sets is shown in panel C of table 2.

4.2 Empirical models

This study applies four models widely used in value relevance studies (e.g., Harris et al., 1994; Collins et al., 1997; Barth et al., 2005, Lang et al., 2006). On the one hand we use three level valuation models to determine to what extent accounting numbers are reflected in the market value of a company's equity. On the other hand we apply a return model to examine the proportion of stock returns that can be explained by earnings information which is regarded as a measure for the timeliness of an accounting system (Barth et al., 2001).

First, we investigate how accounting data, i.e. the summary measures of the income statement (net income[4]) and of the balance sheet (book value of equity) can explain the price or the market value of a

company. It is assumed that the market price of a company is equal to the discounted future cash flows expected by investors and the current accounting data proxy for expected discounted future cash flows (Ashbaugh and Olsson, 2002). Concerning the valuation properties of accounting data, three major types of models have been used in previous studies (Beaver, 2002). The earnings capitalization model is an income-only approach and represents company value as the present value of future permanent earnings. To compare the value relevance of the different accounting systems with respect to this model the following equation is estimated:

$$MV_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 NI_{it} + \varepsilon_{it} \qquad (1)$$

where for company i and year t MV_{it} is the market value of equity three months after fiscal period end, $\sum_{t=1998}^{2005} \alpha_t YEAR_{it}$ is a term for yearly fixed effects to account for the panel structure of the data and NI_{it} is the net income before extraordinary items and preferred dividends of firm i for the period t. The net income is alternatively measured according to IFRS, US GAAP or HGB.

The focus of the balance sheet-based book value model is on the association between the book value of equity and the market value of a company's equity. This model indicates what proportion of the market value of a company's equity is recognised on the accounts. The following equation is estimated to address this question:

$$MV_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 BVE_{it} + \varepsilon_{it} \qquad (2)$$

where BVE_{it} is the book value of equity of firm i at the end of period t and the other variables are defined as mentioned above.

To investigate the combined value relevance of earnings and book values we use a model is based on Ohlson (1995). This basic model for studies of value relevance is based on a regression of market value on earnings and book value of equity:

$$MV_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 NI_{it} + \beta_2 BVE_{it} + \varepsilon_{it} \qquad (3)$$

where the variables are defined as mentioned above. Second, we examine how accounting data can explain a company's performance defined as the buy and hold return. Therefore, we use the following return model:

$$R_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 NI\_defl_{it} + \varepsilon_{it} \qquad (4)$$

where for company i and year t R_{it} is the buy and hold return during the fiscal period (defined as the change in the market value of equity during this period plus any dividends paid during this period). The variable NI_defl_{it} is defined as NI_{it} but deflated by market value of equity at the beginning of the period.

We run the regressions (1) - (4) for the pooled

sample as well as for the matched data set and the adopters data sets separately for the different accounting systems (IFRS, US GAAP, HGB) and compare the adjusted R^2. To test the differences in the adjusted R^2 we apply the bootstrap method with replacement. Thereby, we derive estimates of standard errors based on 10,000 resamples of the original data. The advantage of this method compared to several other tests is that fewer assumption (e.g. about the distribution of the data) are required. Using bootstrapped standard errors, we are able to test whether the adjusted R^2 of IFRS or US GAAP is significantly higher than that of HGB.

5 Results

5.1 Descriptive statistics

Tables 3, 4, and 5 report descriptive statistics for the variables used in the analysis. The descriptive statistics for the variables in pooled data set are displayed in table 3. As can be seen from the table the mean of the non-deflated net income and of the non-deflated book value of equity is largest for the IFRS sample. Concerning the deflated net income, the mean is approximately equal to 0 for all three samples.

< Table 3 >

However, the results of the pooled data set are biased by the different sizes of the samples for the different accounting systems and by the different distributions of size and industry of the firm-year observations in the samples. For example the mean and the standard deviations of the return and the market value data are significantly different between the three samples. To control for these differences, we examine industry and size matched samples. The descriptive statistics for these samples is reported in table 4. As can be seen from the table, the differences in the mean, media and standard deviation of the market data (return and market value of equity) of the three samples are much smaller than in the basic market value and return and sample. Concerning the comparison of HGB and IFRS, the mean of net income and of book value of equity is higher under IFRS, whereas the medians of these data are quite similar. Comparing HGB and US GAAP accounting data no significant differences in the means and medians can be found. Finally, the net income and book value of equity according to IFRS shows a higher mean and median than the data according to US GAAP.

< Table 4 >

The descriptive statistics for the adopters data set (table 5) is similar to the descriptive statistics of the matched sample.

< Table 5 >

5.2 Regression results
5.2.1 Pooled data set

The regression results for the pooled data set are reported in table 6. Estimating equations (1) - (3) show the highest adjusted R^2 for the HGB sample, followed by the IFRS and the US GAAP sample. The

differences between HGB and IFRS are small, but using a Z-test based on bootstrapped standard errors the hypothesis that the adjusted R^2 for the IFRS sample is higher than that for the HGB sample could be rejected with on all conventional significance levels. US GAAP yields especially for the association of book value of equity and market value of equity (equation (2)) a substantially lower adjusted R^2. Consequently, the hypothesis of a higher value relevance for US GAAP data than for HGB data could be rejected for this model.

Moreover, the coefficient on BVE_{it} is insignificant for the US GAAP sample in equation (3). Except for the US GAAP sample the adjusted R^2 appears to be higher in equation (2) than in equation (1) indicating that book value of equity is more value relevant than net income. The average intercepts from the yearly fixed effects regressions are statistically different from 0 only for the IFRS sample in the book value model (2) and the combined model (3), which implies that the model is well specified (Ashbaugh and Olsson (2002)). This implication does neither hold for the HGB nor for the US GAAP sample.

< Table 6 >

An estimation of the return model (equations (4)) results in a low adjusted R^2 for all three accounting systems. The coefficient for NI_{it} is significant on the 1 % level for the US GAAP data, but only significant on the 10 % level for the HGB and IFRS data. In contrast to the results from estimating the market value model, the regression of return on net income reveals that the adjusted R^2 for the US GAAP and the IFRS firm-year observations (0.3955 and 0.3146) are substantially greater than that for HGB (0.0754) observations. Overall the results of using the pooled samples provides evidence for a higher value relevance of HGB and IFRS in comparison to US GAAP for the market value model but also for a higher value relevance of US GAAP and IFRS than for HGB for the return model. However, the results from the pooled data set might be biased by industry and size effects. We control for these effects in the matched data set.

5.2.2 Matched data set

We estimated equations (1) - (4) for data sets matched for industry and size of the firms (table 7). First, we used the IFRS vs. HGB data set with 617 firm-year observations for each sample. The market value models (2) and (3) show no significant differences in the coefficients or in the adjusted R^2 of the HGB and of the IFRS samples. Only for the association of NI_{it} with the market value of equity (model (1)) we were able to reject the hypothesis that IFRS is more value relevant than HGB. We find that for IFRS data book value of equity is more important than net income in estimating market values. For HGB no significant difference exists between the adjusted R^2 of a regression of market value of equity on these variables. Using the return equation for the comparison of HGB and IFRS confirms the result of

the pooled samples above. We find a higher adjusted R^2 for the IFRS sample than for the HGB sample. However, for both accounting systems the coefficient of net income is not significant (IFRS) or only significant on the 10 % level (HGB).

< Table 7 >

Second, we estimate the equations (1) - (3) and (4) for the US GAAP vs. HGB matched data set comprising 296 observations for each accounting system. Concerning the market value models, regressions based on US GAAP data reveal lower adjusted R^2 than regressions based on HGB data. Hence, the hypothesis that US GAAP is more value relevant than HGB for these models could be rejected for equations (1) – (3). The coefficient of the average intercept is significant on a lower level in models (2) and (3) for US GAAP than for HGB and in the combined model (3) the coefficient of book value of equity for US GAAP data is not statistically different from 0. However, the results of using the HGB vs. US GAAP matched data set for estimating equation (4) suggest that US GAAP data is more relevant in estimating returns than HGB data. In each sample book value of equity is more value relevant than net income. One exception appears for the application of the market value models to the US GAAP sample.

Third, we examine the IFRS vs. US GAAP data set containing 454 firm-year observations for each sample. Whereas the results of equation (1) are very similar, IFRS performs substantially better in equations (2) and (3). Moreover, according to IFRS (US GAAP) book value of equity seems to be more (less) value relevant than net income. In the combined model book value of equity is only significant on the 10 % level for the US GAAP sample but significant at the conventional levels for the IFRS data. The coefficient of the average intercept in equations (2) and (3) is insignificant for the IFRS data, but significant at least on the 10 % level for the US GAAP data. The estimations of equation (4) for the IFRS vs. US GAAP matched samples reveal approximately the same adjusted R^2 for the US GAAP data and for the IFRS data. The coefficients of net income are highly significant for both data sets. Thus, the results of the pooled samples are similar to these in the matched data sets.

5.2.3 Adopters data set

Table 8 shows the regression results from estimating equation (1) - (4) for the adopters samples. The IFRS vs. HGB data set consists of 163 firm-year observations for each accounting system. The results from estimating the market value models show that IFRS yields a higher adjusted R^2 for the market value models (equations (1) - (3)). Again, the results indicate that book value of equity is more value relevant than net income in determining the market value of equity of a company. For the combined model (3) the coefficient of net income is even insignificant for the IFRS sample. Similar to the matched data sets, the coefficient of the average

intercept is not statistically different from 0 in models (2) and (3) for the IFRS data, but significant (at least on the 10 % level) for the HGB data. Concerning the return model (4), IFRS reveals a higher adjusted R^2 and a coefficient which is more highly significant than HGB.

< Table 8 >

The adopters data sets US GAAP vs. HGB and IFRS vs. US GAAP contain 35 and 36 firm-year observations respectively. Concerning the market value models (1) - (3), the adjusted R^2 is high for all accounting systems and no significant differences can be found. For equation (4) US GAAP data yields a higher adjusted R^2 than HGB or IFRS data. The hypothesis that IFRS is more value relevant than US GAAP for this model could be rejected on a significance level of 5 %. Overall, the results of using the adopters samples provide evidence that IFRS performs better than HGB in estimating the market value and the return of a company. Additionally, US GAAP seems to be more value relevant than HGB and IFRS for the return of a company. The results of a comparison between IFRS and US GAAP and between HGB and US GAAP using the market value models are inconclusive. However, except for the comparison of HGB and IFRS the results must be interpreted with caution due to the small sample sizes.

5.2.4 Overall results

First, we investigate whether net income or book value of equity is more value relevant for the three accounting systems. In line with our hypothesis stated above, the book value model (2) reveals a higher adjusted R^2 and less significant average intercepts and therefore a higher value relevance than the earnings capitalization model (1) for IFRS and HGB data. Moreover, for these two accounting systems the coefficients of net income are less significant than the coefficients of book value of equity in the combined model (3). However, for the US GAAP data net income is more value relevant than book value of equity.

Second, the value relevance of the three accounting systems is evaluated for all four models. Concerning the earnings capitalization model (1) the results are inconclusive. The value relevance of HGB data is higher than that of IFRS in the pooled samples and in the matched samples but not in the adopters samples. Compared to US GAAP, HGB also performs better in the pooled and in the matched samples, the result of the adopters samples are very similar and due to the small sample size not very reliable. The results of estimating equation (2) for HGB and IFRS data are similar for the pooled and the matched samples, but in the adopters samples IFRS performs substantially better than HGB. The US GAAP book values are substantially less value relevant than those of HGB and of IFRS in model (2). A comparison of the value relevance of the different accounting systems using the combined model (3) shows similar results as the analysis of model (2). IFRS and HGB perform similar

and better than US GAAP data in the pooled and matched samples, in the adopters samples IFRS is more value relevant than HGB. Using the return model (4) the regression results reveal a higher value relevance of IFRS and US GAAP than HGB in all samples. For the comparison of US GAAP and IFRS data the matched samples are most relevant as they control for industry and size effects and have a sufficient sample size. However, in these samples the value relevance of IFRS and US GAAP is not significantly different.

To summarize, the regression results of models (1) and (4) are inconclusive, but the results of models (2) and (3) suggest that IFRS is more value relevant than HGB and US GAAP. A comparison of HGB and US GAAP shows mixed results. HGB performs better in models (1) - (3) but substantially worse in the return model.

6 Sensitivity analyses

6.1 Observations form companies listed at the "Neuer Markt"

To examine the sensitivity of the reported results several tests were performed.[6] First, we separately examined the value relevance of firm-year observations from new economy companies which were listed at the "Neuer Markt". From 1997 until 2003 growth firms were trading in this segment of the German Stock Exchange. The value relevance of the accounting data of these companies may be different from these of other companies due to the following reasons. First, the companies in the "Neuer Markt" substantially differed in size, growth rates and risk in comparison to other listed companies. Therefore, the market value and returns of the "Neuer Markt" companies (especially during the stock market bubble in the years 1999 and 2000) were mainly based on future prospects and growth opportunities than on fundamental (accounting) data. Second, as a study of Glaum and Street (2003) suggests many firms did not comply with all requirements of the accounting systems. Therefore, low associations of accounting data with market data could be rather due to the (lack of) enforcement of the provisions than to the provisions themselves. Moreover, according to this study the compliance level was significantly lower for companies applying IFRS than for companies applying US GAAP which could bias the results of our study.

The results of a separate analysis of firm-year observations from companies listed at the "Neuer Markt" show that for these companies IFRS and US GAAP perform substantially worse in all models in estimating market values and returns than for other companies. For example for the combined market value model (equation (3)) the adjusted R^2 for 301 (232) IFRS (US GAAP) firm-year observations from the "Neuer Markt" companies is 0.2010 (0.2690) compared to 0.8430 (0.6531) for the other companies. However, examining the value relevance of the

accounting systems only for firm-years from companies not listed at the "Neuer Markt" shows that our inferences and therefore our ranking of the accounting systems in terms of value relevance do not change.

6.2 Loss firm-year observations

As demonstrated in several studies, positive and negative values of net income are valued differently (Hayn, 1995; Burgstahler and Dichev, 1997). These studies suggest that negative net income is considered to be transitory and therefore is less value relevant than positive net income. Thus, we added a dummy to our models control for loss firm-year observations. This dummy is 1 if the firm-year observation has a negative net income and 0 otherwise. Then we rerun our regressions with the dummy added in an interaction term with the variable net income. The interaction term is significant and negative in most of the models and samples. Exceptions are model (3) for all IFRS samples, model (4) for HGB in the US GAAP vs. HGB matched sample and models (2) and (4) for HGB in the IFRS vs. HGB adopters sample, where the interaction term is not significant. The overall result is in line with prior research suggesting differences in value relevance between profit and loss firm year observations.

Including the interaction term with a dummy for loss firm-year observations slightly increases the adjusted R^2 of all models for all accounting systems. Exception are models (1) and (3) of the IFRS samples and model (3) for HGB in the adopters samples where the adjusted R^2 remains unchanged or slightly declines. Concerning the comparison of the value relevance of the different accounting systems, the inclusion of the interaction term with a dummy for loss firm-year observations does not change the ranking of the accounting systems found above.

6.3 Changes during time

To control for changes of the capital market, of institutional conditions, and of the accounting standards, we conducted our tests also on a year-to-year basis. The value relevance of the IFRS accounting data shows a peak in the years 2000-2002 but has decreased since then (especially in the return model). Similar to the IFRS data the US GAAP data reveals its highest value relevance in the years 2002-2003 but decreased afterwards. One possible reason for these results might be that people might have got more critical about the advantages of international accounting systems. The accounting scandals in the US and in other countries may have weakened the trust in the reliability of financial statements following international accounting standards.

For the HGB data an increase in the value relevance of the accounting data (especially of the book value of equity) can be recognised for the market value models (equations (1) - (3)) since 2000. However, during the same period the value relevance dropped to nearly 0 in the return model.

7 Summary

This study investigates the research question what impact an adoption of IFRS or US GAAP has on the value relevance of German companies' financial statements. Using a sample of all listed firms in Germany in the period of 1998 to 2005 we analyse the value relevance of accounting data prepared under IFRS and US GAAP and compare it with the value relevance of accounting data prepared under the domestic accounting system (HGB). Thereby, we use three different valuation models, i.e. the earnings capitalization model, the book value model, and a combined valuation model. Concerning our research question, we document that for IFRS and HGB data the book value of equity is more value relevant than net income in determining the market value of a company's equity, for US GAAP the results are the other way around. In addition, our findings suggest that IFRS provides more value relevant accounting data than HGB and US GAAP in the book value and the combined market valuation model, whereas the results for the earnings capitalization model are inconclusive. In the return model IFRS and US GAAP perform similar, but better than HGB. Overall, we provide evidence that IFRS accounting produces more value relevant data than HGB and US GAAP. However, the differences in the value relevance of the accounting systems are lower than expected.

The sensitivity analyses showed that for firm-year observations from the "Neuer Markt" the accounting systems yield substantially lower value relevance. Excluding these observations from the samples does not change our inferences. Other tests show that the well known effect of a loss firm-year observation showing a lower value relevance than firm-year observations with positive net income can be observed in our data sets. However, the inclusion of an interaction term between net income and a dummy for loss firm-year observations does not change the overall result. Finally, in a year-to-year examination we found the highest value relevance for IFRS (US GAAP) accounting data in the years 2000-2002 (in the year 2002). Since then value relevance has decreased for both accounting systems. For HGB value relevance has increased for the market value models, but has decreased for the return model since 2000. We acknowledge the following limitations of our study. First, although we control for industry and size effects in our matched samples our analysis may be biased by the self selection of the companies applying a specific accounting system. Second, our study focuses only on German firms which mitigate the generalization of our results to other countries, especially to those with a different institutional setting. Third, most German investors are found to focus on the balance sheet and income statement. However, disclosure and other information sources might also have an influence on the value relevance of financial statements.

NOTES

1. The IFRS were initially called International Accounting Standards (IAS). In 2002 they changed name to International Financial Reporting Standards (IFRS). We use this new term throughout the paper.

2. Companies publicly traded both in the European Union and on a regulated third-country market and which are therefore applying another internationally accepted accounting system (especially US GAAP) in their consolidated accounts are allowed to defer the application of IFRS until 2007. This also holds for companies which only have publicly traded debt securities.

3. In 2005 an external enforcement system was established due to the Accounting Law Control Act (Bilanzkontrollgesetz, BilKoG). For details see Delvaille et al. (2005) and Noack and Zetzsche (2005).

4. We include fiscal periods beginning in 2004 for which data were available by 31 December 2005.

5. The result of the income statement is called "profit or loss for the period" according to IFRS. However, we use the more common term "net income".

6. For sake of brevity, the results of these tests are not reported in tables.

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Table 1. Distribution of observations by accounting system and industry

year	Accounting system	DAX	MDAX	SDAX/ SMAX	TecDAX	Neuer Markt	Other	Total
1998	IFRS	5	4			2	2	13
	HGB	8	28			2	123	161
	US GAAP	0	3			1	0	4
	Total	13	35			5	125	178
1999	IFRS	8	10			21	13	52
	HGB	5	28			2	176	211
	US GAAP	2	6			16	1	25
	Total	15	44			39	190	288
2000	IFRS	7	13	11		70	10	111
	HGB	5	32	72		8	115	232
	US GAAP	3	8	1		52	6	70
	Total	15	53	84		130	131	413
2001	IFRS	9	17	23		112	18	179
	HGB	2	24	68		4	115	213
	US GAAP	3	8	2		85	11	109
	Total	14	49	93		201	144	501
2002	IFRS	12	25	28		96	25	186
	HGB	2	19	21		3	117	162
	US GAAP	3	10	4		78	7	102
	Total	17	54	53		177	149	450
2003	IFRS	10	20	21	7		122	180
	HGB	1	9	11	3		118	142
	US GAAP	3	7	5	17		67	99
	Total	14	36	37	27		307	421
2004	IFRS	11	22	25	11		134	203
	HGB	1	5	10	1		109	126
	US GAAP	4	5	3	14		48	74
	Total	16	32	38	26		291	403
	IFRS	0	2	1	1		11	15

2005	HGB	0	1	0	0		4	5
	US GAAP	1	0	0	0		4	5
	Total	1	3	1	1		19	25
Total		105	306	306	54	552	1,356	2,679

Notes: DAX reflects the German blue chip segment comprising the 30 largest and most actively traded German companies. MDAX is the mid-cap segment, SDAX (called SMAX until 2002) is the small-cap, TecDAX (founded in 2003) is the technology sector segment, Neuer Markt was the German new market for technology stocks which was replaced by the TecDAX in 2003, and other are the remaining observations.

Table 2: Distribution of observations by accounting system and industry

Panel A: Pooled sample

Industry	IFRS	HGB	US GAAP	Total
Basic industries	30	145	23	198
Capital goods	176	354	89	619
Consumer durables	35	94	21	150
Consumer non-durables	61	222	5	288
Consumer service	226	256	92	574
Energy	6	0	0	6
Health care	88	43	61	192
Public utilities	32	57	16	105
Technology	277	81	180	538
Transportation	8	0	1	9
Total	939	1,252	488	2,679

Panel B: Matched samples

Industry	HGB vs. IFRS	HGB vs. US GAAP	IFRS vs. US GAAP
Basic industries	30	22	17
Capital goods	176	89	89
Consumer durables	35	21	21
Consumer non-durables	59	5	5
Consumer service	168	87	89
Health care	43	13	45
Public utilities	25	0	7
Technology	81	59	180
Transportation	0	0	1
Total	617	296	454

Table 2 (continued)
Panel C: Adopters samples

Industry	HGB vs. IFRS	HGB vs. US GAAP	IFRS vs. US GAAP
Basic industries	15	0	3
Capital goods	59	10	7
Consumer durables	15	1	0
Consumer non-durables	9	0	0
Consumer service	40	12	11
Health care	9	1	3
Public utilities	3	0	0
Technology	13	12	11
Total	163	36	35

Tables 3. Descriptive statistics for the pooled samples

Variables	IFRS (N=939)			HGB (N=1252)			US-GAAP (N=488)		
	Mean	Median	Standard deviation	Mean	Median	Standard deviation	Mean	Median	Standard deviation
MV_{it}	1,091,618	66,521	3,287,593	641,669	98,080	2,487,703	834,776	71,535	3,238,992
R_{it}	0.0540	-0.0468	0.7171	0.0735	0.0145	0.4982	-0.0260	-0.1815	0.7109
NI_{it}	58,698	1471	208,600	32,833	5,701	136,465	22,624	316	129,362
NI_defl_{it}	-0.0882	0.0200	0.4668	0.0606	0.0537	0.9650	-0.0845	0.0034	0.2874
BVE	512,334	46,984	1,479,060	311,626	74,030	1,246,776	347,236	50,042	1,138,889

Notes: For company i and year t MV_{it} is the market value of equity three months after fiscal period end, R_{it} is the buy and hold return during the fiscal period (defined as the change in the market value of equity during this period plus any dividends paid during this period), NI_{it} is the net income before extraordinary items and preferred dividends, NI_defl_{it} is the net income before extraordinary items and preferred dividends divided by the market value of the company at the beginning of the fiscal period, BVE_{it} is the book value of equity, and BVE_{it} is the book value of equity divided by the market value of the company at the beginning of the fiscal period. The book value of equity and the net income are alternatively measured according to IFRS, US GAAP or HGB.

Table 4. Descriptive statistics for the matched samples
Panel A: IFRS vs. HGB

Variables	IFRS (N=617)			HGB (N=617)		
	Mean	Median	Standard deviation	Mean	Median	Standard deviation
MV_{it}	1,226,114	122,255	3,477,803	842,314	104,780	3,242,859
R_{it}	0.1246	0.0108	0.6971	0.0845	0.0021	0.5493
NI_{it}	70,369	3,547	218,625	43,122	5,344	171,779
NI_defl_{it}	-0.0615	0.0368	0.5040	0.0369	0.0487	1.2337
BVE_{it}	607,881	66,049	1,660,125	397,974	72,483	1,614,875

Panel B: US GAAP vs. HGB

Variables	US GAAP (N=296)				HGB (N=296)		
	Mean	Median	Standard deviation		Mean	Median	Standard deviation
MV_{it}	1,056,429	95,855	4,016,944		798,952	97,654	3,543,134
R_{it}	0.0091	-0.1421	0.7256		0.0888	-0.0118	0.5937
NI_{it}	35,938	1,373	155,410		36,382	2,966	194,475
NI_defl_{it}	-0.0790	0.0126	0.3295		-0.0566	0.0413	0.6031
BVE_{it}	429,385	60,111	1,313,728		386,822	75,647	1,857,803

Panel C: IFRS vs. US GAAP

Variables	IFRS (N=454)				US GAAP (N=454)		
	Mean	Median	Standard deviation		Mean	Median	Standard deviation
MV_{it}	727,150	51,668	3,202,466		711,739	66,203	3,240,138
R_{it}	-0.0397	-0.2057	0.7403		-0.0314	-0.1885	0.7195
NI_{it}	26,732	437	173,210		16,973	65	121,437
NI_defl_{it}	-0.0851	0.0050	0.4158		-0.0862	0.0013	0.2872
BVE_{it}	376,518	38,071	1,630,024		257,746	46,116	909,729

Notes: For company i and year t MV_{it} is the market value of equity three months after fiscal period end, R_{it} is the buy and hold return during the fiscal period (defined as the change in the market value of equity during this period plus any dividends paid during this period), NI_{it} is the net income before extraordinary items and preferred dividends, NI_defl_{it} is the net income before extraordinary items and preferred dividends divided by the market value of the company at the beginning of the fiscal period, BVE_{it} is the book value of equity, and BVE_{it} is the book value of equity divided by the market value of the company at the beginning of the fiscal period. The book value of equity and the net income are alternatively measured according to IFRS, US GAAP or HGB.

Table 5: Descriptive statistics for the adopters samples

Panel A: IFRS vs. HGB

Variables	IFRS (N=163)				HGB (N=163)		
	Mean	Median	Standard deviation		Mean	Median	Standard deviation
MV_{it}	956,364	175,680	2,713,487		788,797	161,789	2,073,056
R_{it}	0.1510	0.1077	0.5561		0.1485	0.0380	0.5220
NI_{it}	62,595	6,391	199,939		38,856	8,957	93,903
NI_defl_{it}	0.0128	0.0468	0.2693		0.0663	0.0614	0.3286
BVE_{it}	584,655	135,521	1,323,155		409,469	123,751	909,424

Panel B: US GAAP vs. HGB

Variables	US GAAP (N=36)				HGB (N=36)		
	Mean	Median	Standard deviation		Mean	Median	Standard deviation
MV_{it}	813,804	49,520	4,018,277		528,783	41,690	2,426,358
R_{it}	-0.2199	-0.2708	0.6079		-0.0123	-0.1323	0.7225
NI_{it}	21,511	1,362	107,416		25,457	907	91,323
NI_defl_{it}	-0.0443	0.0125	0.2049		0.0023	0.0201	0.9597
BVE_{it}	186,538	36,733	485,198		120,265	17,501	323,207

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Table 5
Panel C: IFRS vs. US GAAP

Variables	IFRS (N=35)			US GAAP (N=35)		
	Mean	Median	Standard deviation	Mean	Median	Standard deviation
MV_{it}	1,377,069	56,899	4,907,708	1,757,623	51,168	6,656,534
R_{it}	0.2316	-0.0109	0.8385	0.5171	0.2980	0.9804
NI_{it}	43,641	3,427	17,0904	24,886	178	108,174
NI_defl_{it}	-0.0003	0.0157	0.2138	-0.1636	0.0114	0.3747
BVE_{it}	426,053	42,594	1,547,327	264,417	32,492	794,782

Notes: For company i and year t MV_{it} is the market value of equity three months after fiscal period end, R_{it} is the buy and hold return during the fiscal period (defined as the change in the market value of equity during this period plus any dividends paid during this period), NI_{it} is the net income before extraordinary items and preferred dividends, NI_defl_{it} is the net income before extraordinary items and preferred dividends divided by the market value of the company at the beginning of the fiscal period, BVE_{it} is the book value of equity, and BVE_{it} is the book value of equity divided by the market value of the company at the beginning of the fiscal period. The book value of equity and the net income are alternatively measured according to IFRS, US GAAP or HGB.

Table 6. Regression results for the pooled samples

Equation 1: $MV_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 NI_{it} + \varepsilon_{it}$

Accounting system	Variables		Adjusted R²	
	Intercept	NI_{it}	Value	Test
- IFRS	323,203	13.0911	0.7059	IFRS > HGB
(N=939)	4.72***	11.23***		-2.51***
- US GAAP	379,757	20.11	0.6439	IFRS > US GAAP
(N=488)	8.10***	9.70***		2.02
- HGB	118,110	15.9461	0.7644	US GAAP > HGB
(N=1252)	3.11***	13.77***		-3.98***

Equation 2: $MV_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 BVE_{it} + \varepsilon_{it}$

Accounting system	Variables		Adjusted R²	
	Intercept	BVE_{it}	Value	Test
- IFRS	80,203	1.9741	0.8069	IFRS > HGB
(N=939)	1.08	13.65***		-1.02
- US GAAP	252,631	1.6765	0.3419	IFRS > US GAAP
(N=488)	5.74***	13.24***		20.32
- HGB	77,207	1.8113	0.8256	US GAAP > HGB
(N=1252)	2.05**	15.00***		-17.07***

Equation 3: $MV_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 NI_{it} + \beta_2 BVE_{it} + \varepsilon_{it}$

Accounting system	Variables			Adjusted R²	
	Intercept	NI_{it}	BVE_{it}	Value	Test

- IFRS	85,047	4.7258	1.4232	0.8350	IFRS > HGB
(N=939)	1.17	5.26***	9.08***		-1.05
- US GAAP	353,860	19.3468	0.1244	0.6442	IFRS > US GAAP
(N=488)	4.91***	6.51***	0.40		7.16
- HGB	59,504	6.0828	1.2273	0.8509	US GAAP > HGB
(N=1252)	1.72*	4.67***	10.63***		-7.13***

Table 6 (continued)

Equation 4: $R_{it} = \sum_{t=1998}^{2004} \alpha_t YEAR_{it} + \beta_1 NI\_defl_{it} + \varepsilon_{it}$

Accounting	**Variables**		**Adjusted R²**	
system	Intercept	NI_defl$_{it}$	Value	Test
- IFRS	0.0728	0.2130	0.3146	IFRS > HGB
(N=939)	7.53***	1.94*		1.27
- US GAAP	0.0163	0.5001	0.3955	IFRS > US GAAP
(N=488)	2.25**	5.85***		0.11
- HGB	0.0701	0.0572	0.0754	US GAAP > HGB
(N=1252)	33.85***	1.67*		1.09

Notes: The table shows the regression results from the stated equations with yearly fixed effects and White-corrected standard errors. For the variables, the first measure is the coefficient of the variable(s) and the second below is the t-statistics. For the adjusted R² "Value" means the appropriate value of the adjusted R² of the regression and "Test" reports the test statistics of a Z-test using bootstrapped standard errors for the hypotheses stated. * means the statistics is significant at the 10 % level, ** means the statistics is significant at the 5 % level, and *** means the statistics is significant at the 1 % level.
For company i and year t MV$_{it}$ is the market value of equity three months after fiscal period end, R$_{it}$ is the buy and hold return during the fiscal period (defined as the change in the market value of equity during this period plus any dividends paid during this period), NI$_{it}$ is the net income before extraordinary items and preferred dividends, NI_defl$_{it}$ is the net income before extraordinary items and preferred dividends divided by the market value of the company at the beginning of the fiscal period, and BVE$_{it}$ is the book value of equity. The book value of equity and the net income are alternatively measured according to IFRS, US GAAP or HGB.

Table 7. Regression results for the matched samples

Equation 1: $MV_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 NI_{it} + \varepsilon_{it}$

Sample	*Accounting*	**Variables**		*Adjusted R²*	
	system	Intercept	NI$_{it}$	Value	Test
- IFRS vs. HGB	IFRS	309,463	13.0264	0.6823	IFRS > HGB
(N=617)		3.19***	9.45***		-5.45***
	HGB	104,204	17.1166	0.8234	
		1.65	11.66***		
- US GAAP vs. HGB	US GAAP	293,713	21.2231	0.6650	US GAAP > HGB
(N=296)		3.32***	8.63***		-6.38***
	HGB	180,461	16.9997	0.8655	
		2.66***	9.10***		
- IFRS vs. US GAAP	IFRS	340,469	14.4651	0.6796	IFRS > US GAAP
(N=454)		8.04***	9.14***		0.42
	US GAAP	341,473	21.8145	0.6639	
		6.62***	7.18***		

Equation 2: $MV_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 BVE_{it} + \varepsilon_{it}$

Sample	*Accounting* system	Variables		Adjusted R²	
		Intercept	BVE$_{it}$	Value	Test
- IFRS vs. HGB	IFRS	73,236	1.8966	0.8342	IFRS > HGB
(N=617)		0.84	13.24***		0.35
	HGB	120,176	1.8145	0.8192	
		2.11**	12.69***		
- US GAAP vs. HGB	US GAAP	297,188	1.7682	0.3134	US GAAP > HGB
(N=296)		3.05***	7.79***		-26.67***
	HGB	86,452	1.8419	0.9357	
		2.05**	16.88***		
- IFRS vs. US GAAP	IFRS	64,036	1.7612	0.8766	IFRS > US GAAP
(N=454)		1.09	11.30***		18.68
	US GAAP	174,825	2.0831	0.3356	
		1.69*	5.18***		

Table 7 (continued)

Equation 3: $MV_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 NI_{it} + \beta_2 BVE_{it} + \varepsilon_{it}$

Sample	*Accounting* System	Variables			Adjusted R²	
		Intercept	NI$_{it}$	BVE$_{it}$	Value	Test
- IFRS vs. HGB	IFRS	64,038	3.0329	1.5606	0.8446	IFRS > HGB
(N=617)		0.75	2.71***	7.39***		-0.66
	HGB	83,330	9.1694	0.9136	0.8534	
		1.41	3.17***	3.54***		
- US GAAP vs. HGB	US GAAP	292,635	21.1949	0.0049	0.6638	US GAAP > HGB
(N=296)		2.60***	7.24***	0.02		-9.56***
	HGB	91,035	4.3583	1.4202	0.9435	
		2.37**	2.22**	5.66***		
- IFRS vs. US GAAP	IFRS	79,046	3.7515	1.4550	0.8728	IFRS > US GAAP
(N=454)		1.26	1.97**	6.63***		7.10
	US GAAP	291,661	20.3991	0.2865	0.6668	
		2.75***	7.64***	0.69*		

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Equation 4: $R_{it} = \sum_{t=1998}^{2004} \alpha_t YEAR_{it} + \beta_1 NI\_defl_{it} + \varepsilon_{it}$

Sample	*Accounting* System	Variables		Adjusted R²	
		Intercept	NI_defl$_{it}$	Value	Test
- IFRS vs. HGB	IFRS	0.1334	0.1437	0.2441	IFRS > HGB

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(N=617)		20.75***	1.37	0.82
	HGB	0.0834	0.0289	0.0654
		145.09***	1.85*	
- US GAAP vs. HGB	US GAAP	0.0498	0.5151	0.4248	US GAAP > HGB
(N=296)		10.42***	8.52***		3.28
	HGB	0.0933	0.0803	0.0659
		42.58***	2.07**	
- IFRS vs. US GAAP	IFRS	-0.0161	0.2778	0.4057	IFRS > US GAAP
(N=454)		-3.06***	4.50***		2.99
	US GAAP	0.0175	0.5673	0.4054
		3.19***	8.93***	

Notes: The table shows the regression results from the stated equations with yearly fixed effects and White-corrected standard errors. For the variables, the first measure is the coefficient of the variable(s) and the second below is the t-statistics. For the adjusted R^2 "Value" means the appropriate value of the adjusted R^2 of the regression and "Test" reports the test statistics of a Z-test using bootstrapped standard errors for the hypotheses stated. * means the statistics is significant at the 10 % level, ** means the means the statistics is significant at the 5 % level, and *** means the statistics is significant at the 1 % level. For company i and year t MV_{it} is the market value of equity three months after fiscal period end, R_{it} is the buy and hold return during the fiscal period (defined as the change in the market value of equity during this period plus any dividends paid during this period), NI_{it} is the net income before extraordinary items and preferred dividends, NI_defl_{it} is the net income before extraordinary items and preferred dividends divided by the market value of the company at the beginning of the fiscal period, and BVE_{it} is the book value of equity. The book value of equity and the net income are alternatively measured according to IFRS, US GAAP or HGB.

Table 8. Regression results for the adopters samples

Equation 1: $MV_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 NI_{it} + \varepsilon_{it}$

Sample	*Accounting system*	**Variables**		*Adjusted R²*	
		Intercept	NI_{it}	Value	Test
- IFRS vs. HGB	IFRS	229,447	11.6131	0.7386	IFRS > HGB
(N=163)		2.37**	7.52***		5.00
	HGB	317,709	12.1240	0.3177
		3.52***	5.22***	
- US GAAP vs. HGB	US GAAP	9,566	37.3868	0.9661	US GAAP > HGB
(N=36)		0.60	50.27***		0.14
	HGB	-150,443	26.68	0.9273
		-3.29***	14.84***	
- IFRS vs. US GAAP	IFRS	-938,613	53.0624	0.9725	IFRS > US GAAP
(N=35)		-2.19**	5.39***		0.60
	US GAAP	281,756	59.3048	0.9499
		3.26***	17.08***	

Equation 2: $MV_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 BVE_{it} + \varepsilon_{it}$

Sample	*Accounting system*	**Variables**		*Adjusted R²*	
		Intercept	BVE_{it}	Value	Test
- IFRS vs. HGB	IFRS	-103,036	1.8120	0.8012	IFRS > HGB

(N=163)		-0.53	5.42***		4.56
	HGB	151,590	1.5562	0.4776	
		2.00**	8.42***		
- US GAAP vs. HGB	US GAAP	-733,517	8.2949	0.9356	US GAAP > HGB
(N=36)		-25.5***	53.77***		0.02
	HGB	-425,072	7.9313	0.9436	
		-36.3***	81.56***		
- IFRS vs. US GAAP	IFRS	-686,165	4.8427	0.9945	IFRS > US GAAP
(N=35)		-11.7***	35.29***		0.72
	US GAAP	-451,544	8.3549	0.9525	
		-1.22	5.96***		

Table 8 (continued)

Equation 3: $MV_{it} = \sum_{t=1998}^{2005} \alpha_t YEAR_{it} + \beta_1 NI_{it} + \beta_2 BVE_{it} + \varepsilon_{it}$

Sample	*Accounting system*	**Variables**			**Adjusted R²**	
		Intercept	NI_{it}	BVE_{it}	Value	Test
- IFRS vs. HGB	IFRS	-50,569	2.8130	1.4211	0.8060	IFRS > HGB
(N=163)		-0.28	1.57	3.50***		4.49
	HGB	121,469	3.1715	1.3288	0.4846	
		1.73*	2.14**	5.78***		
- US GAAP vs. HGB	US GAAP	143,291	43.7633	-1.4522	0.9656	US GAAP > HGB
(N=36)		0.30	1.82*	-0.27		0.08
	HGB	-341,120	9.1870	5.2885	0.9475	
		-3.46***	0.81	1.64		
- IFRS vs. US GAAP	IFRS	-674,610	-1.4149	4.9605	0.9943	IFRS > US GAAP
(N=35)		-12.75***	-1.07	23.28***		0.28
	US GAAP	-155,116	30.0286	4.4076	0.9807	
		-1.24	3.04***	3.66***		

Equation 4: $R_{it} = \sum_{t=1998}^{2004} \alpha_t YEAR_{it} + \beta_1 NI\_defl_{it} + \varepsilon_{it}$

Sample	*Accounting system*	**Variables**		*Adjusted R²*	
		Intercept	NI_defl_{it}	Value	Test
- IFRS vs. HGB	IFRS	0.1426	0.6544	0.3333	IFRS > HGB
(N=163)		48.12***	2.83***		8.78
	HGB	0.1360	0.1884	0.0615	
		24.55***	2.25**		
- US GAAP vs. HGB	US GAAP	-0.1797	0.9070	0.4796	US GAAP > HGB
(N=36)		-9.81***	2.19**		3.09
	HGB	-0.0127	0.1753	0.1376	

		-29.5***	0.92		
- IFRS vs. US GAAP	IFRS	0.2317	0.2608	0.2296	IFRS > US GAAP
(N=35)		929.6***	0.35		-2.13**
	US GAAP	0.7380	1.3509	0.5213	
		21.82***	6.53***		

Notes: The table shows the regression results from the stated equations with yearly fixed effects and White-corrected standard errors. For the variables, the first measure is the coefficient of the variable(s) and the second below is the t-statistics. For the adjusted R² "Value" means the appropriate value of the adjusted R² of the regression and "Test" reports the test statistics of a Z-test using bootstrapped standard errors for the hypotheses stated. * means the statistics is significant at the 10 % level, ** means the means the statistics is significant at the 5 % level, and *** means the statistics is significant at the 1 % level.

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