

Lifting the Veil of Accounting Information under Different Accounting Standards – Lessons Learned from the German Experiment^S

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Abstract

It is well-known from US-related studies that investors systematically overreact to accrual-based accounting information. We address the question to what extent this accrual anomaly is related to different accounting standards. We provide empirical evidence that the accrual anomaly is also present in Germany. However, this anomaly has become particularly important after the year 2000 and cannot be detected for firms presenting their financial statements under German GAAP. It is argued that introducing true and fair view accounting, like IFRS, that relies on difficult-to-verify information, may not be suitable to improve accounting information quality in the context of a weak corporate governance system.

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1 Introduction

The recent accounting scandals relating to firms like Enron, Worldcom, or Parmalat have shown that accounting data is subject to manipulation. Though this insight may not be new, it nevertheless raises public attention towards serious frictions in the information gathering process of public capital markets. As long as these frictions are related to fraudulent misrepresentation in financial statements only, our paradigm of informational efficient capital markets might not be seriously challenged. In that case the society should focus on improving the enforcement of accounting rules, as it has been done in the aftermath of the Enron accounting scandal.² However, if it turns out that investors can be systematically deceived even by management's discretionary - but lawful - application of accounting rules, the paradigm of informational efficient capital markets has to be put into question rather seriously.

It has been pointed out in a seminal paper by Sloan (1996) that the capital market might be unable to lift the veil of accounting information. In fact, by splitting up US-firms' earnings in a cash flow and a non cash flow related part, where the latter is usually labelled as accruals, he finds that earnings can much better be explained by prior year's cash flows than by prior year's accruals. Simultaneously, he can show that investors' earnings expectations, as reflected in securities prices, seem not to correctly account for this difference in the persistence of the two earnings components. Moreover, investors' earnings expectations tend to be biased upwards with respect to accruals and at the same time biased downwards with respect to operating cash flows. As similar results have been presented by other studies over the last years, it has become widespread to label this phenomenon as the accrual anomaly. It is an anomaly because investors seem to behave as naïve decision makers, in as much they fixate on aggregate earnings without correctly taking into account the difference in the persistency of cash flows relative to accruals. Taking

² From this perspective it seems that the US regulatory response to accounting fraud was successful, in as much the introduction of the Sarbanes Oxley Act in 2002 seems to have reduced earnings manipulations of US firms; cf. Cohen et al. (2005).

into account that earnings management predominantly comes from accruals, this is the same as saying that the market can be deceived by financial statements' window dressing.

Evidently, the accrual anomaly is bad news for the widespread understanding of informational efficient capital markets. It is therefore important to gather a deeper knowledge of the driving factors behind these findings. Actually, some cross-country studies indicate that the accrual anomaly is less severe in code law countries. As a consequence the obvious question arises, whether and to what extent the anomaly is related to the regulatory environment. Evidently, given that there must be a link between the accrual anomaly and the earnings management activities of a company, specific corporate governance mechanisms as well as accounting rules can be thought of driving this alleged market inefficiency. To improve our understanding it might be important to isolate the relative impact of these two variables. Moreover, from an accounting perspective we will be especially interested in assessing the impact of different accounting standards. This, unfortunately, is not possible in a cross-country approach, as it is difficult to observe to what extent a difference in accrual mispricing is due to a different corporate governance regime and to what extent it might be due to different accounting rules.

To our understanding, the German capital market provides highly interesting evidence in this regard, as over the last 10 years an intriguing capital market experiment is going on there. Actually, by the beginning of this period almost all German companies complied with German-GAAP (HGB), while over recent years almost all of them switched to international accounting standards, either IFRS/IAS or US-GAAP.³ Therefore, the German experiment is a natural choice for addressing the question to what extent the investors' perception of accounting information differs among different accounting standards for a given corporate governance regime.

³ The reader should note that by the year 2005 all listed companies in the European Union have to comply with IFRS/IAS as far as their consolidated financial statements are concerned.

Needless to say, the answer to this question has important implications with respect to accounting regulation.

Our findings are quite interesting and make a contribution to the literature in at least two directions. First, we find clear evidence that the accrual anomaly discovered by Sloan (1996) is also present on the German capital market confirming hereby the ubiquitousness of this phenomenon. Second, and most importantly, we find clear evidence that the overreaction to accrual-based information is mostly related to firms complying with international accounting standards. This is quite astonishing as there is conventional wisdom that IFRS/IAS and US-GAAP provide more accurate financial information to the capital market than German-GAAP. For instance, Bartov et al. (2001) report that earnings disclosed under Anglo-Saxon accounting standards do better explain stock returns than cash flow figures alone, while this kind of superiority of earnings over cash flows does not exist for financial statements disclosed under German or Japan accounting rules. Results pointing in the same direction have been presented also by Harris et al. (1994) or Leuz and Verrecchia (2000). It should be emphasized that our findings do not necessarily contradict these studies, as they analyze to what extent stock price movements can be explained by earnings figures. This paper, however, is focused on the question whether the stock price movement itself is efficient given the information content of earnings figures. Hence, it may well be that under a specific accounting standard the stock price movement is in the short run highly associated with disclosed earnings but nevertheless inefficient in the sense that there is an accounting driven bias in the assessment of the firm's long run profitability. Moreover, these papers once again suffer from a lack of cross-sectional variance in the sense that they cannot separate between the influence coming from the corporate governance system and the influence coming from the accounting system.

As in this paper the influence of different accounting systems is scrutinized holding the corporate governance system constant, it will be able to address the question whether disclosed information quality is superior under a true and fair view

accounting approach, as represented by IFRS or US-GAAP, or under a conservative accounting approach, as represented by German GAAP. Although intuitively one might expect the former to be superior over the latter in terms of disclosure quality, our results point in the opposite direction. The simple explanation for this result is related to an idea recently put forward by Guay and Verrecchia (2006). Conservative accounting relies on easy-to-verify information, while true and fair view accounting aims to incorporate a substantial amount of difficult-to-verify information, like fair value information of non traded assets. Evidently, the second approach leaves much more discretion to management as the first one. Hence, the quality of information disclosed under a true and fair view approach is intertwined with the quality of corporate governance. From that perspective it might not be that surprising anymore, why true and fair view accounting is not superior in terms of information quality under a weak corporate governance system, as it is the German one. Evidently, this result challenges the recent trends in European accounting regulation.

The paper proceeds as follows. Section 2 summarizes the related literature. Section 3 discusses the theoretical background underlying our study. Moreover, it develops the hypotheses and describes our research design. Section 4 presents the results, while section 5 will summarize the study.

2 Related Literature

Accruals are often used in empirical studies as a measure for earnings management. Deviations of reported current accruals from their fair values typically result in future corrections of earnings⁴. Therefore, a relatively high degree of earnings management should cause a relatively low earnings persistency. Since the seminal paper of Sloan (1996), showing that investors' earnings expectations reflected in securities prices do not correctly account for the different degree of persistency of accruals versus cash flows, several studies corroborate investors' overreaction with

⁴ Dechow and Dichev (2002) develop a model of the quality of accruals and earnings. They show that accrual estimation errors result in future earnings' corrections.

respect to the information contained in accruals. This phenomenon is called the accrual anomaly.⁵ The US-related study by Xie (2001) confirms the empirical results of Sloan (1996) and refines them by introducing a more accurate measure of earnings management based on the definition of abnormal accruals.⁶ This result is further corroborated in a study presented by Chen and Cheng (2002). They argue that abnormal accruals can be used by management either to signal private information about future performance or for opportunistic earnings management. By identifying a sub-sample of firms where the management is more likely to engage in earnings management they can show that future abnormal returns are negatively associated with abnormal accruals for these firms, whereas the association is positive for those firms that are presumed to use abnormal accruals as a mean for signalling future performance. Therefore, investors seem not to be able to detect the management's motivation for using abnormal accruals.

One strand of literature has concentrated on the question whether the extent of the accrual anomaly is related to the degree of sophisticated investors active on the capital market.⁷ Ali et al. (1999) find that the overvaluation of accruals increases with the number of institutional investors holding shares of a firm. In contrast, Collins et al. (2003) show that firms with a relatively high level of transient institutional ownership are less affected by the mispricing of accruals. Further empirical results related to the US stock market demonstrate that biased analysts' earnings expectations contribute to the market's overreaction with respect to accruals, e.g. Bradshaw et al. 2001, Elgers et al. 2003. After all, the effect of investor sophistication on the accrual anomaly for the US stock market is rather mixed.

⁵ It should be noted that the accrual anomaly is not the only phenomenon indicating that capital market might react inefficiently to accounting data. Most importantly, the literature on the post earnings announcement drift should be mentioned here; for related evidence cf. Ball and Brown (1968) and, for an overview, Ball (1992). A behavioural oriented explanation is presented by Houghe and Loughran (2000).

⁶ This work is based on Jones (1991) who proposed an approach how to differentiate between normal and abnormal accruals.

⁷ It should be noted in this regard that Bartov et al. (2000) find that the post earnings announcement drift in stock prices is primarily due to trading activities of unsophisticated investors.

Most of the empirical studies on the accrual anomaly are based on US data. Only a very few studies analyse this phenomenon in a non-US or international context. Pincus et al. (2003) analyse the valuation of accruals for different common law (e.g. USA, UK) and code law (e.g. Germany, France) countries for the years from 1992 to 2000. They find that the accrual anomaly regularly exists in common law countries, whereas there is no evidence of a mispricing of accruals in the code law countries.⁸ They explain their results with the difference in corporate governance structures between common law and code law countries. Firms in code law countries show a broader set of inside stakeholders, who better perceive the information contained in earnings' components. A similar study has been presented by LaFond (2005). By examining 17 industrialised countries over the period 1989 to 2003 he found the accrual anomaly to be a global phenomenon in as much a significant mispricing can be detected in all the countries with the exception of Denmark and Norway. Moreover, he finds no evidence that the degree of mispricing is related to managerial discretion, ownership structure, analyst coverage or specific accounting methods. Finally, it should be noted that although the accrual anomaly is a global phenomenon according to the paper of LaFond (2005), he also documents that the degree of accrual overpricing is very different among countries. By looking on the abnormal return of a hedge portfolio long in the low accruals firms and short in the high accrual firms it can be deduced from his results that the average mispricing in Anglo-Saxon countries is almost twice as high as in the Continental European countries and Japan.

To sum up, there is increasing evidence that the accrual anomaly is, in fact, a global phenomenon although the degree of mispricing seems to be more pronounced in common law countries than in code law countries. This is rather striking, for at least two reasons. First, as it has already pointed out earnings reported under international or US accounting standards are usually regarded to provide more

⁸ This is corroborated also by Babalyan (2004) who shows that at least for those German and Swiss firms that comply with IFRS/IAS no overpricing of accruals can be detected.

accurate information about the economic situation of a company (e.g. Bartov et al. (2001) and Harris et al. (1994)). Second, Leuz et al. (2003) find that earnings management is more pronounced in countries with less developed investor protection. Typically, this is the case in code law countries as opposed to common law countries.⁹ According to the authors the theoretical explanation of this finding goes as follows: earnings management activities are driven by the incentive of insiders to protect their private benefits by concealing firm performance from outsiders. Because the collection of private benefits is easier the less developed investor protection is, earnings management incentives are more pronounced in code law countries. Hence, one would expect the accrual anomaly to be more pronounced in code law than in common law countries.

Strictly speaking this reasoning is only true under invariant accounting standards. Hence, whatever the cross-country evidence on the accrual anomaly might be, it will be influenced by cross-sectional variation in corporate governance as well as in the accounting system. In order to sort out to what extent the anomaly is driven by accounting rules only, it is necessary to look at different accounting standards under one corporate governance system. This is the unique advantage of the data set under consideration here. It is very interesting in this regard that Van Tendeloo and Vanstraelen (2004) can show that earnings management as measured by discretionary accruals seems to be more severe for German firms reporting under IFRS/IAS than under German-GAAP (HGB). Similarly, Zimmermann and Gontcharov (2003) report that German firms complying with IFRS/IAS engage more in income smoothing than those complying with German GAAP.

Finally, it should be mentioned that the accrual anomaly can be proved to contradict the assumption of efficient capital market only, if it can be shown that it leads to an economically exploitable mispricing. This has not yet been proven as it is not clear whether the overvaluation of high accrual firms leads to an arbitrage opportunity, if

⁹ Cf. in this regard the comprehensive study of La Porta et al. (2000).

transaction costs and arbitrage risk is taken into account. Several studies (e.g. Collins et al. 2003, Richardson 2003, Mashruwala 2004) examine the attributes of extreme accrual firms for the US stock market. They conclude that high accrual firms are more likely to be exposed to high transaction costs. Furthermore, short selling and hedging strategies seem to be rather risky even for institutional investors because of substantial fundamental and arbitrage risk.

3 Theory, Hypotheses and Research Design

3.1 Accounting Standards, Earnings Quality and Accrual Mispricing

German GAAP undoubtedly is a conservative accounting system. According to Guay and Verrecchia (2006) such a system is characterized by timely recognition of losses and less timely recognition of gains. The prudence principle known under German GAAP relates exactly to this asymmetric treatment of gains and losses. Among others, this is implemented by the imparity principle, which requires unrealized losses to be expensed in the profit and loss statement, while it is not allowed to account for unrealized earnings. This approach, together with a strong emphasis on historical cost accounting, allowed German companies to build up hidden reserves. It has often been argued that in this way German companies have been able to manipulate reported earnings.¹⁰

While we do not disagree with this view, we are interested in the question whether such discretionary opportunities are reduced under Anglo-Saxon driven accounting standards, like US-GAAP or IFRS/IAS. It should be noticed that these standards are build up under the true and fair view principle, which is, basically, a requirement that present and potential investors should be provided with useful information in order to make a rational investment decision. Under this view financial reporting is oriented towards the information requirements of the capital market investors.

¹⁰ Cf. Harris et al. (1994) for some more details on the German accounting system. A spectacular case where the shortcomings of German GAAP have become evident internationally was the near failure of Metallgesellschaft, a large German company a that time; cf. among others Miller and Culp (1995). Wenger/Kaserer (1998) emphasize the problems arising from a conservative accounting system in a weak corporate governance system.

Now, we argue that giving a true picture of the current economic situation of a company is not an easy task and, what is even more important, cannot be done without leaving valuation judgements in the discretion of the management. This can be seen, for instance, in the context of the fair value accounting principle, which is a pillar of the true and fair view approach, as opposed to the historical cost principle governing German GAAP. Calculating a fair value is easy, as long as there is a market price. However, for many assets and liabilities fair value accounting is allowed although market values do not exist. It is evident that management discretion becomes an issue in these cases. More generally, one can say that the true and fair view principle makes economic judgement by people that are responsible for financial reporting much more important. Speaking with Guay and Verrecchia (2006) one can say that conservative accounting systems, like German GAAP, rely on easy-to-verify information, while true and fair view accounting systems, like US-GAAP or IFRS/IAS, rely on difficult-to-verify information. As a consequence, the latter are much more exposed to management's discretion as the former one.¹¹

In order to make this assertion more precise, two short examples should be given here. First, consider the treatment of intangible assets under both accounting approaches. IAS 38.72 states that intangible assets meeting certain criterias could be valued according to the historical cost approach, as it is the case under German GAAP, or according to the revaluation approach. If the latter is used, the book value of the asset is equal to its fair value taking any subsequent amortization or impairment losses into account. Although the fair value shall be determined by reference to an active market, it is evident that the revaluation approach grants large discretionary power to the management. Moreover, German GAAP is by far more restrictive with respect to the recognition of an item as an intangible asset. Most importantly, the recognition of internally generated intangible assets is not allowed,

¹¹ As a corollary it should be noted that an additional reason why German GAAP tend to reduce the importance of subjective judgements is the close relationship between financial and tax accounting in Germany.

while according to IAS 38.51 this is possible. In practice, the recognition of development costs is the most important issue in this context. Again it is evident that when determining the cost of an internally generated intangible asset ample discretion is provided for the management.

A second example in this context is the impairment rule according to IAS 36. Under this rule the company has to assess at each reporting date whether an asset may be impaired and, if so, it has to estimate the recoverable amount of the asset.¹²

According to IAS 36.18 the recoverable amount is, basically, determined by the fair value of the asset. It is evident that for such assets that are not traded on liquid markets this rule grants again huge discretionary power to the management.

Recently, this rule has become notorious because of large goodwill impairment losses. Under German GAAP goodwill has been subject to regular depreciation, while impairment was only exceptionally allowed.¹³

Now, it is not our point to say that there is less discretionary leeway under German GAAP than under international accounting standards. However, the above mentioned examples should have made clear that by taking a closer look at the different accounting rules it is by far not clear which of the different standards gives more window dressing opportunities to the management. Now, if this is the case, why does empirical research indicate that earnings in common law countries, where fair value accounting dominates, do have more explanatory power for stock prices than under code law countries, where up to the nineties fair value accounting was almost absent? Actually, the reason might be that earnings quality is not only influenced by accounting standards, but also by the corporate governance regime. Hence, by looking at earnings quality from a cross-country perspective one cannot

¹² What makes the application of this rule even fuzzier is the fact that impairment is not only done with respect to a single asset but could also be applied to so called cash generating units; cf. IAS 36.6. Cash generating units are unknown under German GAAP.

¹³ Additional examples providing evidence for ampler discretion under IFRS than under German GAAP could be mentioned. For instance, the fair value approach with respect to property, plant, and equipment (IAS 16) or the fair value option for financial instruments (IAS 39) could be indicated here. For a detailed comparison of local accounting standards and IFRS cf. Nobes (2001).

easily differentiate, whether the results are driven by different accounting standards or by a different corporate governance regime.¹⁴ Most probably, both factors will drive the results simultaneously.

Hence, in order to figure out whether one accounting standard improves earnings quality with respect to another, it is of crucial importance to control for the effects coming from the corporate governance environment. This is most easily done, if one looks at companies using different accounting standards under one corporate governance framework. This approach is used in this article.

3.2 *Hypotheses*

The analysis proceeds as follows: first, we show that also for German firms accruals and cash flows have a different predictive power with respect to future earnings, i.e. their persistency is different. Second, we investigate whether investors take account of this difference in persistency when pricing stocks. If this is not the case, the accrual anomaly arises. In a third step, we look at whether the persistency of accrual and cash flows is different under different accounting standards, and, if so, whether this is reflected in stock prices.

More precisely, the following null-hypotheses will be tested.

H₀(i): *Persistence hypothesis*: Earnings persistency with respect to prior year's accruals is not significantly different from earnings persistency with respect to prior year's cash flows.

The second hypothesis tests for capital market efficiency with respect to publicly available information contained in different earnings components

¹⁴ In fact, Leuz et al. (2003) argues that their result, namely that earnings management is less pronounced in common law countries than in code law countries, may be mostly driven by difference in investor protection. As they regard differences in accounting rules as just one element among many others, no explicit analysis of the impact of different accounting rules is possible within their analysis. This point is also emphasized by Bushman and Piotroski (2006) who argue that the development of conservative accounting systems was basically driven by the legal and political system in civil law countries.

H₀(iia): *Accrual anomaly hypothesis I*: The weighting of prior year's accruals and cash flows in investors' earnings expectations reflects without significant bias the persistency measured according to the earnings forecasting relation.

Because the correct perception of earnings persistency by investors should be equivalent to abnormal returns being unrelated to prior year's earnings components, we also test the following alternative hypothesis:

H₀(iib): *Accrual anomaly hypothesis II*: Abnormal returns do not significantly depend on prior year's earnings components, i.e. accruals and cash flows.

Since 1998, German firms are allowed to prepare consolidated financial statements under internationally accepted accounting standards.¹⁵ As has been explained in the previous section, it is by far not clear whether IFRS/IAS or US-GAAP, resp., provide less earnings management opportunities. Therefore, we formulate our third hypothesis:

H₀(iii): *Persistence hypothesis under different accounting standards*: Earnings reported under German-GAAP (HGB) and international accounting standards (IFRS/IAS and US-GAAP) do not significantly differ in persistency with respect to prior year's cash flows versus prior year's accruals.

Finally, the fourth hypothesis is related to the pricing of earnings components under different accounting standards:

H₀(iv): *Accrual anomaly hypothesis under different accounting standards*: German-GAAP (HGB) and international accounting standards (IFRS/IAS and US-GAAP) do not significantly differ with respect to the pricing of earnings components, i.e. accruals and cash flows.

¹⁵ As of 1998, §292a of the German commercial code (HGB) allowed firms to report consolidated balance sheet data under accepted international accounting standards. Since 2005, this act has been replaced by §315a HGB following the guidelines of the European Union that all listed companies have to comply with IFRS/IAS.

3.3 Sample Selection and Measurement of Variables

Accounting data used in this study is from Worldscope database, whereas security returns and control variables are from Thomson Financial Datastream database. The sample consists of firms included in the Datastream Global Market Index for Germany and covers the years from 1995 to 2002. Financial years ending before 1995 could not be used as cash flow data is not available in the Worldscope database. Moreover, the sample excludes banks, insurance companies and other financial services providers because of the peculiarities in the accrual process. Taking missing values into account the final total sample consists of 826 firm-year observations.

Following prior empirical studies, we define earnings EAR_t as the year-end's income before extraordinary items deflated by the average of total assets, whereby the average is measured from total assets at the beginning and the end of the fiscal year.¹⁶ Moreover, we define the cash flow CFO_t as the year-end's net cash flow from operating activities deflated by averaged total assets.¹⁷

Hence, the following definitions are used:

$$EAR_t = \frac{\text{net income before extraordinary items}}{\text{average of total assets}}$$

$$CFO_t = \frac{\text{net cash flow from operating activities}}{\text{average of total assets}}$$

It is commonly accepted to express earnings as the sum of its cash flow and its accrual component. Since we have already defined earnings and cash flows, accruals ACC_t are equal to the difference between these two variables:

$$ACC_t = EAR_t - CFO_t$$

¹⁶ See e.g. Pincus et al. (2003), p. 11.

¹⁷ Referring to the work of Hribar and Collins (2002), we suppose that the cash flow measure provided by the cash flow statement via the Worldscope database is more accurate than a measure that is derived from balance sheet data, like it is reported in Sloan (1996) and Xie (2001).

Although there may be more accurate measures for the discretionary components of earnings,¹⁸ we rely on this relatively rough definition. It rules out the possibility to exactly identify the eventually mispriced components, but extremely simplifies our empirical analysis. Nevertheless, we should be able to detect any kind of mispricing on the whole.

Abnormal security return ARE_t is calculated as the security's buy-and-hold return beginning on May 1st of the year t and ending on April 30th of the year $t+1$ less the corresponding total return on the Datastream Global Market Index of Germany. The return measurement period deviates from the fiscal year because we assume that the accounting data is not fully disclosed until May 1st of the following year.

Furthermore, we define three additional variables that are useful as control variables in our abnormal return regression tests. These are the logarithm of the market value MV_t , the book-to-market ratio $BTMV_t$, and the earnings-to-price ratio ETP_t , each of them measured four months after the fiscal year-end. We include these three variables in most of our abnormal return regression tests in order to control for the well documented size-, book-to-market- and earnings-to-price effects.¹⁹

4 Empirical Tests and Results

4.1 Descriptive Statistics

We begin our empirical analysis by providing descriptive statistics for the variables employed in our tests. Table 1 reports the mean, the median and the standard deviation of the seven variables for the total sample of 826 observations and four sub-samples. As expected, accruals are on average negative which is also a common result in other related empirical studies.²⁰ Moreover, the sample is split into two sub-periods of almost equal size, lasting from 1995 to 1999 and from 2000 to 2002. The

¹⁸ E.g. consider the model for discretionary accruals created by Jones (1991).

¹⁹ E.g. Fama and French (1996) show that capital market anomalies largely disappear in a three-factor model.

²⁰ E.g. Xie (2001), p. 361, reports that accruals are on average negative due to the large impact of depreciation costs.

comparison of the first and the second sub-period shows that while profitability of firms is lower in the second period, abnormal returns are by far higher. This is interesting, as we have chosen the two sub-periods in a way that both of them include a part of the stock market hype experienced during the years 1999 and 2000. Another way to split the sample is to put those firms that comply with German GAAP into one sub-sample and those that comply with IFRS/IAS or US-GAAP in another. It can be seen from Table 1 that variable medians of these two sub-samples are - with one exception - rather close to each other. Only the abnormal returns seem to be substantially higher for those firms that are complying with international standards. However, in a statistical sense even this difference is not significant. Nevertheless, in order to deal with a potential self selection bias arising from this, an additional sub-sample will be introduced later on. It consists of those firms that switched from national to international accounting standards during the period 1995 to 2002. Hence, every firm in this sub-sample disclosed at least one financial statement under German GAAP and another one under IFRS/IAS or US-GAAP. Without presenting the descriptive statistics it should be mentioned that the picture is quite similar to that given in Table 1.

[\[Insert Table 1\]](#)

Table 2A reports the Pearson and Spearman correlation coefficients for the total sample and the first two sub-samples, showing that multicollinearity should not be a problem in our analysis. In accordance with the results found in earlier studies on the US-American stock market, accruals and cash flows are significantly negatively correlated with a Pearson correlation coefficient of -0.546 for the whole sample period.²¹ To some extent this result may be due to the fact that we normalize all financial statement figures by total assets. In order to see this, assume that return on assets, i.e. earnings divided by total assets, are the same for all the companies. Then the negative correlation between accruals and cash flow arises by definition, because

²¹ For a similar result cf. e.g. Sloan (1996), p. 295.

firms with larger operating assets tend to have higher depreciations, and, hence, highly negative accruals. In order to reach the same return on assets, those firms must have higher operating cash flows. Evidently, in practice we do not have industry independent return on assets. Nevertheless, to the extent that there is not a perfect correlation between deflated accruals and return on assets, a negative correlation between deflated accruals and deflated cash flows arises.²² Hence, it might be safe to argue that this negative correlation is, at least partly, an indication that firms use accruals to make earnings smoother than cash flows.

[\[Insert Table 2A\]](#)

In the second and third panel of Table 2A the correlation coefficients for the two different time periods are shown. The picture is basically the same, although there is one striking difference: the correlation coefficient between accruals and cash flows becomes substantially smaller in absolute terms in the second sub-period, indicating that the degree of earnings smoothing may have decreased with respect to the first sub-period.

In order to see whether this changed behaviour is related to the adoption of local or international accounting standards, we first provide the correlation coefficients for the national resp. international accounting standards sub-sample in panel one and two of Table 2B. Again it can be seen that there is a significant negative correlation between accruals and cash flows, although the degree of correlation – in absolute terms - is substantially higher for firms using German GAAP rather than international standards. It is very interesting to see that this difference in the degree of correlation disappears, if only those firms are considered that switched from national to international standards during the research period. This is what can be seen from the third and fourth panel of Table 2B. To some extent this supports the assertion that by looking at the sub-sample of switching firms results might be

²² Note that according to Table 2A the correlation between deflated earnings and deflated accruals is 0.5, and therefore clearly below 1.

corrected for a potential self selection bias. As a conclusion one can say that at this point we don't have any clear evidence whether accounting standards are influencing the degree of earnings management.

[\[Insert Table 2 B\]](#)

4.2 *Test of the persistence hypothesis*

In order to test the first hypothesis, i.e. the earnings persistency of prior year's accruals and cash flows, we follow the approach proposed by Sloan (1996). Hence, the following linear forecasting model is estimated:

$$EAR_{t+1} = a_0 + b_0d + (a_1 + b_1d) \cdot ACC_t + (a_2 + b_2d) \cdot CFO_t + e_{t+1} \quad (1)$$

The dummy variable d is used in order to test whether persistency may be different depending on the time period under scrutiny or on the accounting standard that firms are using. $H_0(i)$ will be rejected, if the same can be done for the null hypothesis $a_1 = a_2$. Table 3 reports the estimates for the persistency parameters of both earnings components. For the whole sample one year ahead earnings are significantly less persistent with respect to current accruals ($a_1 = 0.506$) than with respect to current cash flows ($a_2 = 0.688$) according to regression results in column (1). This is in accordance with international evidence and reflects what would be expected, if accruals are considered to be the primary earnings management instrument.

[\[Insert Table 3\]](#)

However, by isolating the time as well as the accounting standards effect results become quite interesting. According to results in column (2) it turns out that differences in persistency are mainly due to financial statements published over the period 2000 to 2002. This effect is most probably due to the shift in the accounting frameworks used by the companies, as is suggested by columns (3) and (4).

According to these results there is no significant difference in persistency, if companies are using German GAAP, while this difference becomes significant ones

companies switch to international accounting standards.²³ It should be emphasized that this effect is unlikely to be driven by a self selection effect, as results in column (4) indicate that the effect also exists, even if only those companies are considered that switched from national to international standards at one point in time during the research period. Hence, our evidence is in accordance with the view that the information content of accruals with respect to future earnings decreases, if firms are using a true and fair view accounting framework, while the information content of cash flows is basically unaffected by the accounting framework choice. As a consequence, $H_0(iii)$ can be rejected.

4.3 *A first test of the accrual anomaly hypothesis*

After having shown that there is, in fact, a difference in the persistency of the accruals and cash flow component with respect to future earnings, at least for those firms that comply with international accounting standards, in a second step the interesting question must be addressed, whether this difference is efficiently reflected in securities prices. Following former studies on the accrual anomaly we use the efficient market model as a starting point. In such a market abnormal security returns should depend positively on unexpected earnings changes:

$$ARE_{t+1} = \mathbf{b}_1 \cdot [EAR_{t+1} - E(EAR_{t+1})] + \mathbf{n}_{t+1} \quad (2)$$

Now, putting together the earnings forecasting model in equation (1), where we eliminate the dummy variable, with the rational pricing equation (2) we get the following regression equation system.

$$\begin{aligned} EAR_{t+1} &= \mathbf{a}_0 + \mathbf{a}_1 \cdot ACC_t + \mathbf{a}_2 \cdot CFL_t + \mathbf{e}_{t+1} \\ ARE_{t+1} &= \mathbf{b}_1 \cdot [EAR_{t+1} - (\mathbf{a}_0^* + \mathbf{a}_1^* \cdot ACC_t + \mathbf{a}_2^* \cdot CFL_t)] + \mathbf{n}_{t+1} \end{aligned} \quad (3)$$

²³ However, it cannot be ruled out that specific capital market conditions governing during the stock market hype may have put additional pressure on firms to manage earnings upward. It may well be that these pressures have been a reason why firms switched to international standards, at least in some cases.

Following Sloan (1996), we employ the Mishkin-test²⁴ that consists of an iterative weighted non-linear least squares regression estimation of this system of equations. The null-hypothesis of capital market efficiency with respect to the information contained in accruals and cash flows is tested by the non-linear conditions $\mathbf{a}_j = \mathbf{a}_j^*$ $\forall j = 0,1,2$. Moreover, a Wald coefficient test²⁵ is used in order to additionally test these parameter restrictions.

Results with respect do the whole sample are reported in Table 4. For the 826 firm-year observations between 1995 and 2002, we reject the null-hypothesis $\mathbf{a}_j = \mathbf{a}_j^*$ $\forall j = 0,1,2$ at a marginal significance level of 0.001. Investors' subjective earnings persistency with respect to accruals ($\mathbf{a}_1^* = 0.819$) is very likely to exceed the objective persistency parameter ($\mathbf{a}_1 = 0.507$). Also, the investors seem to overestimate earnings persistency attributable to cash flows ($\mathbf{a}_2 = 0.688$ and $\mathbf{a}_2^* = 0.896$).

[\[Insert Table 4A\]](#)

Interestingly, if financial statements published over the period 1995 to 1999 are considered, it seems that investors underreact to the information contained in both earnings components ($\mathbf{a}_1 = 0.646$ and $\mathbf{a}_1^* = 0.214$; $\mathbf{a}_2 = 0.721$ and $\mathbf{a}_2^* = 0.420$). However, the difference in the objective and subjective persistence parameter is not so pronounced that a rejection of the null-hypothesis is possible.²⁶ In contrast, investors seem to overvalue the persistency of earnings with respect to both components for the following years between 2000 and 2002 ($\mathbf{a}_1 = 0.477$ and $\mathbf{a}_1^* = 1.188$; $\mathbf{a}_2 = 0.709$ and $\mathbf{a}_2^* = 0.894$). In this case a rejection of the null-hypothesis is possible. Hence, at this point we can conclude that there is clear evidence in favour

²⁴ See Mishkin (1983) for a description of the conducted test.

²⁵ Cf. Greene (2000), p. 153 n.

²⁶ It should be noted that the Mishkin-test is highly sensitive with respect to small sample size due to the asymptotic nature of this test. As opposed to that the Wald-test generates a significance level of about 6%.

of the accrual anomaly also in Germany, although the phenomenon seems mainly driven by the period 2000-2002. Hypothesis $H_0(\text{ia})$ can be rejected.

It is interesting, therefore, to look whether this result may be due to a more general change in the capital market's valuation pattern or to a more widespread adoption of international accounting rules. For that purpose it may be purposeful to repeat the above presented efficiency test for those firms only that switched from national to international standards. Results are presented in Table 4B. Most strikingly, it turns out that no significant under- or overreaction to both earnings components can be detected as long as firms comply with national accounting standards. As a consequence, the market seems to react efficiently to the information contained in financial statements prepared under German GAAP. However, if the same firms publish their financial statements according to international accounting standards things look quite different. In fact, in that case the market significantly overestimates the persistency of both earnings components. As a consequence, the price reaction to accounting news is not efficient in a statistical significant sense.

[\[Insert Table 4B\]](#)

As more firms switched from national to international accounting standards during the second half of the research period, it cannot be ruled out that stock price overreaction is, after all, caused by specific circumstances governing market valuation during that time and, hence, not related to a firm's decision whether to set up financial statements according to national or international standards. Therefore, a separate analysis is done for the 2000-2002 period. Results are presented in Table 4C. As can be seen, the null hypothesis of rational pricing has to be rejected once again for the sub-sample of firms following international standards, while for those firms that follow national rules the hypothesis cannot be rejected. This evidence is in accordance with the view that market overreaction to accounting news, especially as far as accrual information is concerned, is related to the presence of a true and fair view accounting system. Hence, we can reject hypothesis $H_0(\text{iv})$ by concluding that

accrual information is not efficiently processed by the market, if a company is using international standards.

[\[Insert Table 4C\]](#)

4.4 *A second test of the accrual anomaly hypothesis*

As a robustness check we use an alternative approach proposed in the literature for testing the accrual anomaly. If investors have rational expectations, i.e. they do not make any systematic errors in forecasting returns, future abnormal returns should not depend on past accounting figures. However, if investors overestimate (underestimate) the persistency of accruals (cash flows), we expect that this mispricing will be resolved over time, and, hence, future abnormal returns will be negatively (positively) associated with past accruals (cash flows). This hypothesis can be directly tested by the following regression model:

$$ARE_{t+1} = \mathbf{q}_0 + \mathbf{b}_0 d + (\mathbf{q}_1 + \mathbf{b}_1 d) \cdot ACC_t + (\mathbf{q}_2 + \mathbf{b}_2 d) \cdot CFL_t + \mathbf{q}_3 \cdot MV_t + \mathbf{q}_4 \cdot BTMV_t + \mathbf{q}_5 \cdot ETP_t + \mathbf{d}_{t+1} \quad (4)$$

The dummy variable d is used in order to test whether market over- or underreaction may be different depending on the time period under scrutiny or on the accounting standard that firms are using. Estimating (4) yields a direct test of hypothesis $H_0(\text{iib})$ and, by including dummy variables for different time periods or different accounting standards, it will give additional insights with respect to hypothesis $H_0(\text{iv})$. Equation (4) explains future abnormal returns by using past accruals and cash flows as well as additional variables in order to control for the well documented size, book-to-market- and earnings-to-price effects.²⁷ Capital market efficiency with respect to the information contained in accruals and cash flows requires the conditions $\mathbf{q}_j = 0$

$\forall j = 1, 2.$

The results of the ordinary least squares regression of model (4) are shown in Table 5. For the total sample of 826 firm-years results in column (1) are in accordance with the

²⁷ Cf. e.g. Fama and French (1996) who show that future abnormal returns are influenced by variables as firm size, book-to-market ratio or earnings-to-price ratio.

rational pricing assumption, as neither current accruals nor current cash flows have a significant impact on future abnormal returns. However, if the regression is run in order to isolate the time effect, i.e. the influence coming from firm-years belonging to the period 2000-2002 is isolated by a dummy variable as is done in column (2), results are quite different. It turns out that there is a significant underreaction with respect to both current accruals and cash flows for the firm-years 1995 and 1999, while for the firm-years 2000-2002 there is a significant overreaction with respect to accruals. By isolating the effect coming from different accounting standards by a dummy variable approach as is done in column (3) and (4), it turns out that this effect is, at least partially, due to the more widespread use of international accounting standards during the second half of our research period. In fact, according to the results presented in column (3) and (4) there is, if at all, an underreaction to earnings presented under German GAAP, while accruals presented under IFRS or US-GAAP are significantly overvalued by the market. Interestingly, even the perception of cash flow information seems to be different under both accounting frameworks

[\[Insert Table 5\]](#)

Overall, the results in Table 5 corroborate the findings of the preceding section. Evidently, the accrual anomaly is present also in Germany. However, we find strong evidence that this phenomenon is driven by the widespread switch to international accounting standards that occurred in Germany since the year 1998. Our results are in accordance with the view that investors do not correctly detect the different earnings persistency with respect to accruals and cash flows for firms presenting their financial statements under an international framework.

5 Summary and Conclusions

We provide evidence that, in accordance with the results reported for the US, earnings are less persistent with respect to prior year's accruals than with respect to prior year's cash flows for German firms as of the year 2000, where the adoption of international accounting standards has become a widespread phenomena. Especially

those firms that provide financial data using international accounting standards, like IFRS/IAS and US-GAAP, exhibit a lower earnings persistency with respect to accruals than with respect to cash flows. For firms following German-GAAP (HGB), there is no difference between the earnings persistency of accruals and cash flows.

For the years prior to 2000, before the adoption of International Accounting Standards has widely taken place in Germany, we do not find evidence in favour of the accrual anomaly in Germany. However, with respect to financial information published during the years 2000-2002 we find a significant overreaction of the capital market to accrual information. We present additional evidence that this result is most likely driven by the fact that true and fair view accounting became more widespread in Germany during this area. In fact, by comparing financial information presented under German GAAP as well as under IFRS/IAS resp. US-GAAP we find strong evidence that market overreaction to accrual information, and to some extent also to cash flow information, is a phenomenon only related to accounting information prepared under international accounting standards. Therefore, we conclude that the change from national to international accounting standards has not increased the reliability of financial accounting data nor improved the financial information processing on the German capital market.

These findings are in accordance with our presumption that conservative accounting systems might be more appropriate in weak corporate governance systems. As true and fair view accounting necessarily relies on information that is difficult to verify, the quality of this information depends on the management incentives to disclose reliable information. If such incentives are weak, e.g. because corporate control is lax, a true and fair view accounting system might be abused and, hence, produce less reliable information. The evidence presented in this paper supports this view.

However, it should be emphasized that this may not be the only interpretation of our results. Most importantly, it could be argued that the different perception of local and international standards relates to the fact that German investors and analysts

have not yet become totally familiar with international accounting principles. But even these would be bad news with respect to the informational efficiency of capital markets and, hence, the efficiency of financial accounting regulation.

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Table 1
Mean, Median and Standard Deviation of Selected Variables^a

<i>Sample</i>	1995-2002	1995-1999	2000-2002	National Standards^b	International Standards^c
<i>N (firm-years)</i>	826	414	412	521	305
<i>EAR</i>	0.040 <i>0.038</i> (0.082)	0.048 <i>0.037</i> (0.054)	0.032 <i>0.038</i> (0.103)	0.047 <i>0.037</i> (0.059)	0.028 <i>0.038</i> (0.111)
<i>ACC</i>	-0.053 <i>-0.053</i> (0.090)	-0.057 <i>-0.061</i> (0.075)	-0.049 <i>-0.047</i> (0.102)	-0.058 <i>-0.059</i> (0.083)	-0.045 <i>-0.047</i> (0.100)
<i>CFL</i>	0.093 <i>0.091</i> (0.086)	0.104 <i>0.102</i> (0.076)	0.082 <i>0.083</i> (0.094)	0.105 <i>0.096</i> (0.082)	0.072 <i>0.084</i> (0.089)
<i>ARE</i>	0.127 <i>0.069</i> (0.505)	0.003 <i>-0.066</i> (0.452)	0.250 <i>0.156</i> (0.525)	0.090 <i>0.038</i> (0.454)	0.189 <i>0.098</i> (0.576)
<i>MV</i>	2.933 <i>2.805</i> (0.692)	2.952 <i>2.819</i> (0.691)	2.914 <i>2.769</i> (0.693)	2.865 <i>2,738</i> (0.801)	3.050 <i>2.993</i> (0.708)
<i>BTMV</i>	0.568 <i>0.464</i> (0.457)	0.483 <i>0.435</i> (0.318)	0.654 <i>0.518</i> (0.550)	0.526 <i>0.452</i> (0.402)	0.641 <i>0.493</i> (0.530)
<i>ETP</i>	0.061 <i>0.051</i> (0.127)	0.076 <i>0.057</i> (0.122)	0.046 <i>0.048</i> (0.130)	0.076 <i>0.057</i> (0.115)	0.036 <i>0.048</i> (0.141)

^a The variables are computed as follows:

EAR=Earnings before extraordinary items deflated by total average assets

ACC=Earnings before extraordinary items minus cash flow from operating activities deflated by average total assets

CFL=Cash flow from operating activities deflated by average total assets

ARE=Abnormal return measured as the annual buy-and-hold stock return minus the annual return of the Datastream Global Market Index for Germany starting four months after the fiscal year end

MV=Logarithm of the market value four months after the fiscal year end

BTMV=Book-to-market ratio four months after the fiscal year end

ETP=Earnings-to-price ratio four months after the fiscal year end

^b Firm-years with the following accounting standards:

HGB, HGB with EEC and IASC guidelines, HGB with some EEC guidelines

^c Firm-years with the following accounting standards:

IFRS/IAS, US GAAP, US GAAP reclassified from local standards

Table 2 A
Correlation Coefficients for Selected Variables^{a, b}

<i>Sample: 1995-2002</i>		<i>N (firm-years): 826</i>					
	<i>EAR</i>	<i>ACC</i>	<i>CFL</i>	<i>ARE</i>	<i>MV</i>	<i>BTMV</i>	<i>ETP</i>
<i>EAR</i>	1	0.502**	0.431**	-0.087*	0.135**	-0.220**	0.089*
<i>ACC</i>	0.277**	1	-0.546**	-0.072*	0.003*	-0.037	-0.038
<i>CFL</i>	0.447**	-0.615**	1	-0.008	0.126**	-0.171**	0.124**
<i>ARE</i>	-0.013	-0.009	-0.015	1	-0.188**	0.256**	0.127**
<i>MV</i>	0.118**	-0.010	0.149**	-0.189**	1	-0.209**	-0.146**
<i>BTMV</i>	-0.359**	-0.040	-0.230**	0.240**	-0.313**	1	0.049
<i>ETP</i>	0.008	-0.036	0.067	0.212**	-0.228**	0.225**	1
<i>Sample: 1995-1999</i>		<i>N (firm-years): 414</i>					
	<i>EAR</i>	<i>ACC</i>	<i>CFL</i>	<i>ARE</i>	<i>MV</i>	<i>BTMV</i>	<i>ETP</i>
<i>EAR</i>	1	0.343**	0.368**	0.134**	0.072	-0.258**	-0.042
<i>ACC</i>	0.193**	1	-0.747**	0.106*	-0.103*	-0.063	-0.079
<i>CFL</i>	0.409**	-0.722**	1	-0.010	0.153**	-0.120*	0.048
<i>ARE</i>	0.083	0.010	0.045	1	-0.028	0.092	0.057
<i>MV</i>	0.092	-0.122*	0.200**	-0.034	1	-0.306**	-0.263**
<i>BTMV</i>	-0.288**	-0.029	-0.175**	0.116*	-0.382**	1	0.160**
<i>ETP</i>	-0.066	-0.077	0.024	0.117*	-0.289**	0.227**	1
<i>Sample: 2000-2002</i>		<i>N (firm-years): 412</i>					
	<i>EAR</i>	<i>ACC</i>	<i>CFL</i>	<i>ARE</i>	<i>MV</i>	<i>BTMV</i>	<i>ETP</i>
<i>EAR</i>	1	0.581**	0.460**	-0.159**	0.175**	-0.191**	0.142**
<i>ACC</i>	0.354**	1	-0.455**	-0.206**	0.083	-0.039	-0.003
<i>CFL</i>	0.486**	-0.507**	1	0.050	0.101*	-0.167**	0.159**
<i>ARE</i>	-0.099*	-0.109*	0.028	1	-0.325**	0.291**	0.247**
<i>MV</i>	0.142**	0.099*	0.091	-0.368**	1	-0.161**	-0.044
<i>BTMV</i>	-0.417**	-0.081	-0.240**	0.304**	-0.241**	1	0.028
<i>ETP</i>	0.067	0.019	0.093	0.391**	-0.175**	0.268**	1

^a Pearson (upper diagonal) and Spearman (lower diagonal) correlation coefficients

^b The variables are computed as follows:

EAR=Earnings before extraordinary items deflated by total average assets

ACC=Earnings before extraordinary items minus cash flow from operating activities deflated by average total assets

CFL=Cash flow from operating activities deflated by average total assets

ARE=Abnormal return measured as the annual buy-and-hold stock return minus the annual return of the Datastream Global Market Index for Germany starting four months after the fiscal year end

MV=Logarithm of the market value four months after the fiscal year end

BTMV=Book-to-market ratio four months after the fiscal year end

ETP=Earnings-to-price ratio four months after the fiscal year end

** Significance at the 0.01 level (two-tailed)

* Significance at the 0.05 level (two-tailed)

Table 2 B
Correlation Coefficients for Selected Variables^{a, b}

National Standards^c *N (firm-years): 521*

	<i>EAR</i>	<i>ACC</i>	<i>CFL</i>	<i>ARE</i>
<i>EAR</i>	1	0.370**	0.341**	0.081
<i>ACC</i>	0.227**	1	-0.747**	-0.059
<i>CFL</i>	0.393**	-0.624**	1	0.118**
<i>ARE</i>	0.069	-0.017	0.049*	1

International Standards^d *N (firm-years): 305*

	<i>EAR</i>	<i>ACC</i>	<i>CFL</i>	<i>ARE</i>
<i>EAR</i>	1	0.645**	0.514**	-0.192**
<i>ACC</i>	0.355**	1	-0.323**	-0.102
<i>CFL</i>	0.538**	-0.447**	1	-0.124*
<i>ARE</i>	-0.143*	-0.008	-0.090	1

National Standards, Switching Firms^e *N (firm-years): 253*

	<i>EAR</i>	<i>ACC</i>	<i>CFL</i>	<i>ARE</i>
<i>EAR</i>	1	0.462**	0.409**	0.071
<i>ACC</i>	0.319**	1	-0.621**	0,014
<i>CFL</i>	0.365**	-0.636**	1	0.049
<i>ARE</i>	-0.014	-0.013	0.016	1

International Standards, Switching Firms^e *N (firm-years): 173*

	<i>EAR</i>	<i>ACC</i>	<i>CFL</i>	<i>ARE</i>
<i>EAR</i>	1	0.410**	0.458**	-0.282**
<i>ACC</i>	0.217**	1	-0.623**	-0.105**
<i>CFL</i>	0.531**	-0.608**	1	-0.140
<i>ARE</i>	-0.112*	0.039	-0.142	1

^a Pearson (upper diagonal) and Spearman (lower diagonal) correlation coefficients

^b The variables are computed as follows:

EAR=Earnings before extraordinary items deflated by total average assets

ACC=Earnings before extraordinary items minus cash flow from operating activities deflated by average total assets

CFL=Cash flow from operating activities deflated by average total assets

Market Index for Germany starting four months after the fiscal year end

MV=Logarithm of the market value four months after the fiscal year end

BTMV=Book-to-market ratio four months after the fiscal year end

ETP=Earnings-to-price ratio four months after the fiscal year end

^c Firm-years with the following accounting standards:

HGB, HGB with EEC and IASC guidelines, HGB with some EEC guidelines

^d Firm-years with the following accounting standards:

IFRS/IAS, US GAAP, US GAAP reclassified from local standards

^e Firms that switched from national to international standards over the research period

** Significance at the 0.01 level (two-tailed)

* Significance at the 0.05 level (two-tailed)

Table 3

OLS Regression of One-year Ahead Earnings on Current Accruals and Cash Flows^a
(Standard Errors in Parentheses)

$$EAR_{t+1} = a_0 + b_0d + (a_1 + b_1d) \cdot ACC_t + (a_2 + b_2d) \cdot CFO_t + e_{t+1}$$

<i>Sample</i>	(1) All firms 1995-2002	(2) All firms 1995-1999	(3) All firms National Standards	(4) Switching Firms National Standards
<i>Base Case</i>				
<i>N (firm-years)</i>	826	826	826	426
a_0	0.004 (0.003)	0.009 (0.005)	0.011* (0.004)	0.003 (0.005)
β_0		-0.011 (0.007)	-0.017** (0.006)	-0.001 (0.007)
a_1	0.506** (0.029)	0.682** (0.060)	0.540** (0.048)	0.634** (0.049)
β_1		-0.242** (0.068)	-0.086 (0.061)	-0.229** (0.083)
a_2	0.688** (0.030)	0.746** (0.059)	0.647** (0.049)	0.754** (0.051)
β_2		-0.046 (0.069)	0.107 (0.064)	-0.085 (0.082)
R^2	0.404	0.418	0.413	0.456
<i>adj. R²</i>	0.403	0.414	0.410	0.449
$a_1 = a_2^b$	rejection**	no rejection	no rejection	no rejection
$a_1 + \beta_1 = a_2 + \beta_2^c$		rejection**	rejection**	rejection**

^a The variables are computed as follows:

EAR=Earnings before extraordinary items deflated by total average assets

ACC=Earnings before extraordinary items minus cash flow from operating activities deflated by average total assets

CFL=Cash flow from operating activities deflated by average total assets

d=Dummy variable equal 0 in the base case szenario and otherwise equal 1 (in eq. (2) if firm-year belongs to 2000-2002, in eq. (3) and (4) if firm is using international standards

^b Hypothesis test by comparing the confidence intervals of the coefficients

^c Hypothesis test by a Wald test statistic (cf. Greene (2000), p. 153 n.)

** Significance at the 0.01 level using a two-tailed t-test

* Significance at the 0.05 level using a two-tailed t-test

Note that regression results seem not to be affected by multicollinearity, as the highest VIF is equal to 1.67.

Table 4A

**Iterative Weighted Non-linear Least Squares for the System of Forecasting Equation
and Rational Pricing Equation
(Asymptotic Standard Errors in Parentheses)**

$$EAR_{t+1} = a_0 + a_1 \cdot ACC_t + a_2 \cdot CFL_t + e_{t+1}$$

$$ARE_{t+1} = b_1 \cdot [EAR_{t+1} - (a_0^* + a_1^* \cdot ACC_t + a_2^* \cdot CFL_t)] + n_{t+1}$$

<i>Sample</i>	1995-2002	1995-1999	2000-2002
<i>N (firm-years)</i>	826	414	412
a_1	0.507 (0.028)	0.646 (0.041)	0.439 (0.040)
a_2	0.688 (0.030)	0.721 (0.041)	0.700 (0.044)
a^*_1	0.819 (0.122)	0.214 (0.169)	1.188 (0.234)
a^*_2	0.896 (0.122)	0.420 (0.157)	0.894 (0.192)
$L^a : a^*_0 = a_0 ; a^*_1 = a_1 ; a^*_2 = a_2$	14.658	3.872	8.070
<i>Significance Level (Mishkin Test)</i>	<0.001	<0.250	<0.025
<i>Significance Level (Wald Test)</i>	<0.001	<0.062	<0.001

^aThe following Likelihood-ratio statistic is distributed asymptotically $\chi^2(q)$:

$$L = 2N \log \left(\frac{SSR^c}{SSR^u} \right)$$

whereby q =number of constraints, N =number of firm-years, SSR^c =sum of squared residuals of the constrained system, SSR^u =sum of squared residuals of the unconstrained system

Table 4B

Iterative Weighted Non-linear Least Squares for the System of Forecasting Equation and Rational Pricing Equation

(Asymptotic Standard Errors in Parentheses)

$$EAR_{t+1} = a_0 + a_1 \cdot ACC_t + a_2 \cdot CFL_t + e_{t+1}$$

$$ARE_{t+1} = b_1 \cdot [EAR_{t+1} - (a_0^* + a_1^* \cdot ACC_t + a_2^* \cdot CFL_t)] + n_{t+1}$$

<i>Subsample of Switching Firms</i>	All	National Standards	Int'l. Standards
<i>N (firm-years)</i>	426	253	173
a_1	0.555 (0.040)	0.634 (0.043)	0.404 (0.079)
a_2	0.723 (0.040)	0.754 (0.044)	0.668 (0.076)
a^*_1	0.731 (0.141)	0.483 (0.167)	1.356 (0.340)
a^*_2	0.924 (0.141)	0.553 (0.174)	1.606 (0.330)
$L^a: a^*_0 = a_0; a^*_1 = a_1; a^*_2 = a_2$	19.462	2.446	49.088
<i>Significance Level (Mishkin Test)</i>	<0.001	<0.550	<0.001
<i>Significance Level (Wald Test)</i>	<0.007	<0.430	<0.007

^a The following Likelihood-ratio statistic is distributed asymptotically $\chi^2(q)$:

$$L = 2N \log \left(\frac{SSR^c}{SSR^u} \right)$$

whereby q =number of constraints, N =number of firm-years, SSR^c =sum of squared residuals of the constrained system, SSR^u =sum of squared residuals of the unconstrained system

Table 4C

**Iterative Weighted Non-linear Least Squares for the System of Forecasting
Equation and Rational Pricing Equation
(Asymptotic Standard Errors in Parentheses)**

$$EAR_{t+1} = a_0 + a_1 \cdot ACC_t + a_2 \cdot CFL_t + e_{t+1}$$

$$ARE_{t+1} = b_1 \cdot [EAR_{t+1} - (a_0^* + a_1^* \cdot ACC_t + a_2^* \cdot CFL_t)] + n_{t+1}$$

<i>Subsample 2000-2002</i>	National Standards	Int'l. Standards
<i>N (firm-years)</i>	177	235
<i>a₁</i>	0.444 (0.062)	0.373 (0.055)
<i>a₂</i>	0.557 (0.068)	0.801 (0.062)
<i>a*₁</i>	0.770 (0.271)	1.152 (0.299)
<i>a*₂</i>	0.276 (0.288)	1.288 (0.276)
<i>L^a : a*₁=a₁; a*₂=a₂</i>	4.067	6.920
<i>Significance Level (Mishkin Test)</i>	<0.145	<0.034
<i>Significance Level (Wald Test)</i>	<0.073	<0.031

^aThe following Likelihood-ratio statistic is distributed asymptotically $\chi^2(q)$:

$$L = 2N \log \left(\frac{SSR^c}{SSR^u} \right)$$

whereby q =number of constraints, N =number of firm-years, SSR^c =sum of squared residuals of the constrained system, SSR^u =sum of squared residuals of the unconstrained system

Table 5

OLS Regression of Abnormal Returns on Earnings Components and Control Variables^a
(Standard Errors in Parentheses)

$$ARE_{t+1} = q_0 + b_0d + (q_1 + b_1d) \cdot ACC_t + (q_2 + b_2d) \cdot CFL_t + q_3 \cdot MV_t + q_4 \cdot BTMV_t + q_5 \cdot ETP_t + d$$

	(1)	(2)	(3)	(4)
<i>Sample</i>	All firms	All firms	All firms	Switching firms
<i>Base Case</i>	1995-2002	1995-1999	National Standards	National Standards
<i>N (firm-years)</i>	826	826	826	426
$?_0$	0.218** (0.084)	0.062 (0.086)	0.101 (0.088)	-0.136 (0.108)
β_0		0.228** (0.050)	0.234** (0.050)	0.171* (0.072)
$?_1$	-0.331 (0.230)	1.746** (0.456)	0.635 (0.380)	1.019* (0.476)
β_1		-2.728** (0.519)	-1.270** (0.480)	-1.887* (0.787)
$?_2$	0.007 (0.247)	1.417** (0.452)	1.305** (0.385)	1.020* (0.485)
β_2		-1.468** (0.525)	-2.018** (0.506)	-1.770* (0.787)
$?_3$	-0.093** (0.025)	-0.085** (0.024)	-0.094** (0.025)	-0.022 (0.030)
$?_4$	0.246** (0.038)	0.213** (0.037)	0.229** (0.038)	0.265** (0.043)
$?_5$	0.378** (0.136)	0.527** (0.131)	0.502** (0.136)	0.765** (0.229)
R^2	0.097	0.175	0.126	0.167
<i>adj. R²</i>	0.092	0.167	0.118	0.151
$?_1 + \beta_1 = 0$		rejection**	rejection*	rejection*
$?_2 + \beta_2 = 0$		no rejection	rejection*	no rejection

^a The variables are computed as follows:

Datastream Global Market Index for Germany starting four months after the fiscal year end assets

CFL=Cash flow from operating activities deflated by average total assets

MV=Logarithm of the market value four months after the fiscal year end

BTMV=Book-to-market ratio four months after the fiscal year end

ETP=Earnings-to-price ratio four months after the fiscal year end

d=Dummy variable equal 0 in the base case szenario and otherwise equal 1 (in eq. (2) if firm-year belongs to 2000-2002, in eq. (3) and (4) if firm is using international standards

** Significance at the 0.01 level using a two-tailed t-test

* Significance at the 0.05 level using a two-tailed t-test

Note that regression results seem not to be affected by multicollinearity, as the highest VIF is equal to 1.82.