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Effects of the IFRS Introduction: Perspective from an Early Stadium to the time after the Mandatory Adoption

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Abstract

Regulators' expectations to the IFRS introduction are high. In our analyses we measure by different variables for market liquidity how inter alia reporting quality and investors' preference developed with IFRS adopter and non IFRS adopter firms over the years, starting in the time of the early adoption. The results from around 35,000 firm year observations in eleven countries show that only particular adopter firms generally show higher liquidity values over the years. Overall we can observe a clear trend. Market liquidity values are significantly higher for IFRS adopter firms during the years before 2005, the year in which reporting of consolidated accounts according to IFRS became mandatory for basically all publicly traded companies within the European Union and several other countries. Predominantly these values decrease over the years and turn into an advance for non IFRS adopter firms in the years after the mandatory adoption. Concluding, the results are supportive for the investors' long term preference, after distorting influences during the adoption years, for the non IFRS adopter firms.

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1. Introduction

Through the introduction of IFRS³ regulators expect better comparability of financial reporting, improvement in reporting quality, hence benefits for the investors (EC Regulation No. 1606/2002), and consequently the enhancement of international investments. The aim of this paper is to investigate if these expectations were fulfilled in the years around the mandatory adoption of IFRS.

To find evidence we observe several thousand firm years around the world. The focus of the study is set on the IFRS adoption in Germany. Firm year observations from around the world are used to evaluate our findings. As the effects in the change of quality of financial reporting and accompanying investor benefits are supposed to be measurable, among other things, in market liquidity, we investigate different representative variables. As proxies for market liquidity we employ the proportion of zero returns, total trading costs, the price impact of trades, and bid-ask spreads. We choose the period between 2001 and 2007 to concentrate on the IFRS adopter groups of voluntary adopters and mandatory adopters. Our focus lies in the effects during the time before mandatory adoption, the time of mandatory adoption, and the time after mandatory adoption. Changes over time are to be expected when likely distorting influences are abolished. These can be the lack of comparability, pre-adoption effects, and difficulties in interpreting the reportings as well as influences through expectations and investors' enthusiasm towards the IFRS introduction.

Due to the fact that IFRS reporting became mandatory to mainly all publicly traded firms in Germany at the same time, it is difficult to find the right benchmark which controls for changes in the dependent variables that are not related to the adoption of IFRS reporting. We therefore choose firms from different countries that did not mandate the introduction of IFRS and furthermore did not differ very much from Germany's economic basic conditions or economic development.

We start with univariate analyses to receive first impressions of what we can expect from later regression analyses and of what we should bring into focus. The univariate analyses show a surprising development: general strong advances of the IFRS adopters between 2001 and 2004 which then decrease between 2005 and 2007 partially resulting in a disadvantage. Due to these outcomes we decide to divide our second test in two periods: the first until the

³ The International Financial Reporting Standards (IFRS), formerly called the International Accounting Standards (IAS), are issued by the International Accounting Standards Board (IASB). The IAS are issued by the IASB's predecessor: the International Accounting Standards Committee (IASC). As the IASB has adopted all standards issued by IASC, we will refer to these standards as IFRS. We use IAS and IFRS interchangeably even though earlier IAS and later IFRS adoptions may have different consequences.

mandatory IFRS adoption and the second after the mandatory adoption. We run multiple regression analyses for the mentioned periods to find that voluntary adopters generally maintain their advance for both periods. Later adopters show significantly lower values of market liquidity. Furthermore market liquidity declines for all IFRS adopters over the sample period. We conduct sensitivity checks and vary the benchmark sample definitions. In sum, the main conclusions are robust, but significance and magnitude are sensitive to the benchmark, which underlines the concerns about the right choice of firms to evaluate the findings.

There are different possibilities to interpret the findings. As early and voluntary adopters show stronger incentives to introduce IFRS and mandatory adopters are forced and consequently less committed, the later group does not entirely implement the IFRS benefits and therefore does not show positive capital market effects. The other interpretation is that positive consequences for early adopters are not due to the IFRS adoption, but to selection effects, as these firms are supposed to be innovative and growing. Our literature review of early studies as well as the close examination of our results lead to the conclusion that the constant decline of IFRS adopters' advances and the partial drop of early voluntary adopters' market liquidity values below the benchmark values in the end, is only supportive for the investors' long term preference, after distorting influences during the adoption years, for the local (conservative) GAAP accounting.

The results are to be regarded with caution. Several influences like governance regimes' supports to the IFRS introduction and transitional effects (facilitations for first time adopters IFRS 1) as well as current market conditions may have been partially distorting. Keeping these in mind, our study shows important evidence and should be of special interest for regulators and policy makers.

The unique contribution of this paper is that it examines the effects from the early beginning of the IFRS introduction to the time after mandatory adoption. That way we are able to truncate distorting influences and to conclude effects on the long run. So far, researchers generally investigated introduction effects for the time before mandatory introduction or until mandatory introduction.⁴ The challenge of analysing the time of and after mandatory adoption is to find an appropriate benchmark. In finance literature, the time after mandatory adoption was only observed as an extract of the entire period and by evaluating the years after the

⁴ See Daske et al. (2008) who already examined the effects for the time from 2001 to 2005 or the study from Armstrong (2007) observing the time from 2002 to 2005 in the EU.

introduction relative to the years before the introduction.⁵ To our knowledge, we are the first to evaluate the findings relative to a contemporaneous worldwide market benchmark for the entire period.

Concluding, we are the first to analyse the effects over a long time and the first to evaluate the findings relative to a contemporaneous market benchmark for all extracts of the period.

The remainder of the paper is organized as follows. Section 2 reviews the literature and develops our hypotheses. Section 3 delineates our research design. Section 4 describes the data and presents the results. Section 5 concludes. In the Appendix, we provide additional details on the construction of our key variables.

⁵ See Platikanova (2007) or Panaanen (2008).

2. Hypothesis Development and Literature Review

There are three main reactions to be expected from the introduction of IFRS⁶. One possibility is a positive reaction mainly because of a higher reporting quality, higher transparency, lower amount of reporting discretion and better comparison possibilities for international analysts. All these effects should reduce information asymmetries and estimation risk.

Another assumption is a negative reaction because of difficulties for the analysts to interpret the new standards and respectively the financial statements (e.g. difficulties to forecast earnings because of the break in the time-series and difficulties to ascertain fair value valuation). Furthermore because of difficulties for the firms to convey information (difficulties because IFRS might not be as adapted to the local environment as the prior GAAP) and to correctly adopt the standards.

A further suggestion lies in between the positive and the negative reaction indicating the reaction being dependent on the firms' reporting incentives, which are shaped by many factors including the countries' legal institutions, various market forces and firms' operating characteristics. This argument is derived from the need of considerable judgment for the application of accounting standards.

Our literature review gives first evidence on empirical results for these aspects.

Evidence for positive reactions

Armstrong et al. (2007) examine the reactions to 16 events between 2002 and 2005 associated with the adoption of IFRS in the EU. They find a positive (negative) reaction to events that increase (decrease) the likelihood of IFRS adoption. Barth et al. (2008) experience higher reporting quality for firms applying IFRS and an improvement in accounting quality after firms adopt IFRS. They base their inferences on a sample of firms in 21 countries that adopted

IFRS between the years 1994 and 2003. Daske and Gebhardt (2006) examine the disclosure quality for Austrian, German, and Swiss firms from the year 1996 to 2004 and show evidence that disclosure quality has increased significantly under IFRS in these three European countries. Ernstberger and Vogler (2008) find a lower cost of equity capital for firms in Germany voluntarily applying internationally accepted accounting principles in the period between 1998 and 2004. Leuz and Verrecchia (2000) find empirical evidence from the

⁶ The International Financial Reporting Standards (IFRS), formerly called the International Accounting Standards (IAS), are issued by the International Accounting Standards Board (IASB). The IAS are issued by the IASB's predecessor: the International Accounting Standards Committee (IASC). As the IASB has adopted all standards issued by IASC, we will refer to these standards as IFRS.

German capital market that increased levels of disclosure lower the information asymmetry component of the firm's cost of capital. Bae et al. (2007) study firms from 49 countries between 1998 and 2004 and find evidence that GAAP differences across countries are associated with economic costs for financial analysts. The study from Lin and Paananen (2007) provides evidence from Germany that the value relevance of earnings and book values increases under IFRS, investigating the firms' earnings and the book value of equity between 2000 and 2005.

Evidence for negative reactions

Daske (2006) investigates if internationally recognised financial reporting standards (IFRS or US-GAAP) reduce the cost of equity capital for adopting firms. The sample is consistent of German firms in the period from 1993 until 2002. He fails to document lower expected cost of equity capital for IFRS and US-GAAP adopters equally and finds out that the expected cost of equity capital rather increases during the transition period. According to Kaserer and Klingler (2008) 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. Their empirical evidence comes from the German capital market investigating reactions to accrual-based accounting information. Paananen (2008) assesses no increase in financial reporting quality for firms in Sweden over the two first years after the adoption of IFRS in 2005. On the contrary, she finds some indications of a decrease in financial reporting quality measured as smoothing of earnings, timely loss recognition, and value relevance. When investigating only committed adopters she even exploits stronger evidence for the decrease.

Evidence for reactions dependent on countries' and firms' characteristics

Ball (2006) finds out that IFRS Implementation is likely to be heterogeneous across countries (e.g. depending on the environment and on firms' incentives). Daske et al. (2007) hypothesize that the economic consequences depend on the extent to which IFRS adoptions represent a serious commitment to transparency and find that "serious" adopters experience significantly stronger effects on the cost of capital and market liquidity than label adopters. Their sample consists of voluntary IFRS adopter firms around the world (24 countries) from 1988 to 2004. Daske et al. (2008) support these findings in their worldwide study (26 countries) from 2001 to 2005 and conclude that reporting quality is shaped by many factors in countries' institutional environments, pointing in particular to the importance of firms' reporting

incentives and countries' enforcement regimes. Lambert et al. (2007) show that the quality of accounting information can influence the cost of capital in either direction, but also derive conditions under which an increase in information quality leads to an unambiguous decline in the cost of capital. This evidence is supportive to Hail and Leuz (2006a). They conclude that firms from countries with more extensive disclosure requirements, stronger securities regulation, and stricter enforcement mechanisms have a significantly lower cost of capital. Also firms with cross-listings on U.S. exchanges experience a decrease in their cost of capital (Hail and Leuz, 2006b). Christensen et al. (2007) examine the economic consequences for UK firms after the European Union's decision to impose mandatory IFRS and show that mandatory IFRS adoption does not benefit all firms in a uniform way but results in relative winners (e.g. with strong reporting incentives) and losers. Dumontier and Maghraoui (2007) investigate for a sample of German firms that switched to IFRS during the 1999-2002 period whether the increased accounting disclosures reduces information asymmetry (being proxied by bid-ask spreads) among market participants. They find out that switching to IFRS increases the information content only of large firms' financial statements relative to local GAAP and that the additional information set related to the new disclosures requires about two years to be fully integrated in spreads. Platikanova (2007) studies the IFRS impact on market liquidity costs on French, German, Swedish and U.K. stock exchanges. Her results are heterogeneous. She finds higher trading costs for U.K. and Swedish firms after 2005. Closing, a survey among senior finance executives documents that they are evenly split between proponents and opponents to IFRS ((PwC/Ipsos MORI, 2007).

Concluding, we draw the following hypotheses. Firms with strong incentives and in a given high quality legal enforcement, as it is the case in Germany, should experience positive capital market effects. Moreover effects should be smaller for mandatory adopters and stronger for voluntary adopters, assuming stronger incentives for latter firms. Furthermore, effects should generally be stronger the more firms apply IFRS and also stronger in the years after the mandatory change in the year 2005, when interpreting and analysing difficulties are supposed to be minimised.

3. Research Design and Data Description

The study examines the effects of the IFRS introduction by analysing the changes in market liquidity for firms in Germany between 2001 and 2007. This measure is chosen as representative for the quality of financial reporting. In the sets of our empirical tests it is scaled by different variables which are referred to as the dependent variables.⁷ The case of Germany is of special interest *inter alia* because of its role in the IFRS adoption process. Before 2005, the year when reporting of consolidated accounts according to IFRS became mandatory for basically all publicly traded companies within the European Union and several further countries, Germany hosted together with Switzerland and Austria more than the half of the worldwide population of IFRS reporting firms. The application of IFRS or US-GAAP for consolidated accounts were already required for firms listed in the now-defunct growth-stock segment 'Neuer Markt' (new market), which was launched in March 1997. The small-cap segment SMAX and the quality segment 'Prime Standard' adopted this requirement in 2001 and 2003 respectively.⁸ Therefore Germany has played an essential role in IFRS-related studies (Leuz and Verrecchia, 2000; Daske, 2006; Barth et al., 2008). Moreover the case of Germany is of special interest since the expected effects should be particularly strong given the reputation of German accounting as being one of the least transparent in the EU.

First, we conduct **univariate analyses**. We calculate the mean values of the dependent variables for the treatment and the control sample for the different years, compare means of (yearly) firm-level changes, and examine t-tests to assess statistical significance.

Second, we estimate the effects employing **multiple regression analyses**. We tabulate Ordinary Least Squares coefficient estimates between the dependent and independent variables. As independent variables we define different IFRS adopter-types (early voluntary, late voluntary and first time mandatory) which we use as dummy variables and different control variables. We separate the regression analyses into the period from 2001 to 2005 (first model) and the period from 2006 to 2007 (second model). In that way we can compare the development of the liquidity variables for the time until and the time after the mandatory adoption. Further we examine t-tests to assess statistical significance and exercise sensitivity analyses by varying the benchmark definitions.⁹

⁷ The approach of the empirical tests is leaned on a study from Daske et al. (2008), that exploits early economic consequences (from 2001 to 2005) of mandatory IFRS reporting for a worldwide sample.

⁸ See Gassen and Sellhorn (2006), p. 366. See p. 372 for an overview of the IFRS adopters between the year 1993 and 2004.

⁹ We follow the finance literature assuming, among other things, daily returns to be normally distributed and see the premises for the application of regressions and t-tests fulfilled. Referring to t-tests, we apply the approximate two tail Gauß test.

In these examinations, which are described in detail below, we are confronted with several empirical challenges. The main challenge is the definition of an **accurate benchmark** to evaluate our results. Due to the fact that IFRS reporting became mandatory to mainly all publicly traded firms in Germany from fiscal year ends on or after December 31, 2005, it is difficult to find the right benchmark which controls for changes in the dependent variables that are unrelated to the adoption of IFRS reporting. We try to respond to this challenge by varying the benchmark definitions and the sample countries.

Another important challenge is that effects of the IFRS introduction may be **anticipated**. As some firms chose to adopt IFRS before it became mandatory, it is likely that effects are anticipated by investors and therefore the capital market effects are less evident in the year of the mandatory IFRS introduction. Thus we also use in our empirical tests observations prior to the mandatory date and moreover split the independent variables to the IFRS adopter types from early voluntary and late voluntary to first time mandatory. Another challenge lies in possible **short-lived adoption** effects. At the time of the IFRS introduction e.g. some investors may be facing problems in forecasting net earnings under IFRS because of the break in the time-series and so negative effects might appear in spite of the improvement of the reporting quality. Moreover firms are offered recognition and disclosure exemptions when applying IFRS for the first time (see IFRS 1). We try to respond to this challenge by observing market effects for the years after the first time adoption of IFRS. Another challenge lies in **separating concurring effects** through higher quality legal enforcement¹⁰ and stronger firms' incentives. These effects are revealed by observing switches in reporting at different times. As some firms already switched to IFRS before it became mandatory, strong incentives under low legal enforcement are suggested with these firms and, respectively, firms that adopt IFRS after it became mandatory are expected to have lower incentives (forced to adopt) under higher legal enforcement and therefore to show lower effects.

3.1. Univariate Analyses

First, we divide our sample for the years from 2001 to 2007 into a treatment and a control sample. The control sample consists of firms that have not adopted IFRS and the treatment sample consists of IFRS adopter firms. **Next**, we define the dependent variables. We use proxies for market liquidity to reflect the quality of financial reporting. The proxy consists of four different variables: *Zero Returns* is the proportion of trading days with zero daily stock returns out of all potential trading days in a given year. *Illiquidity* or price impact is the yearly

¹⁰ See the worldwide study from Daske et al. (2008) for first results comparing observations from capital markets with strong and weak enforcement.

mean of a variation of the Amihud (2002) illiquidity measure i.e., daily absolute stock return divided by trading volume. *Total Trading Costs* are a comprehensive estimate of yearly average round trip transaction costs (including commissions as well as implicit costs from short-sale constraints or taxes) based on a series of daily security and aggregate market returns, as developed by Lesmond et al. (1999). *Bid-Ask Spreads* are the yearly median of daily quoted spreads, measured at the end of each trading day as the difference between the bid price and the ask price divided by the mid-point.¹¹

The **third** step is the univariate comparison of the liquidity effects through the introduction of IFRS reporting. We therefore compute the difference in our variables between IFRS adopters and non-IFRS adopting firms for the years from 2001 to 2007, and then compare the relative change over time to show effects resulting from the increasing number of IFRS reporting firms or from first IFRS interpreting difficulties.

We obtain the necessary data to estimate the model from Bloomberg, Datastream, Reuters, and the International Monetary Fund.

3.2. Multiple Regression Analyses

First, we divide the IFRS adopters into different categories. For our first set of analyses we divide the adopters into early voluntary, late voluntary, and first time mandatory adopters which we use as independent variables. To separate early and late voluntary adopters, we consider the announcement of mandatory IFRS Reporting (June 4, 2002) as breakpoint and define early voluntary adopters as firms that conducted the IFRS adoption until fiscal year end December 31, 2002. Late voluntary adopter firms adopted IFRS on fiscal year ends between January 1, 2003 and December 31, 2004. The two mentioned adopter types become to early voluntary mandatory and late voluntary mandatory, respectively, for fiscal years ending on or after December 31, 2005. First time mandatory adopters applied IFRS for the first time on fiscal year ends on or after December 31, 2005. For our second set of analyses we maintain the three IFRS adopter types. We differentiate between financial reports that were announced early after mandatory and late after mandatory, which refers to the second and third yearly financial statements, respectively, after the adoption of IFRS became mandatory. **Second**, we define the benchmark (firms that have not adopted IFRS) to evaluate the findings. The **third** step is, as described in section 3.1, the definition of the dependent variables. Again we use *Zero Returns*, *Illiquidity*, *Total Trading Costs* and *Bid-Ask Spreads* as proxies for market liquidity.

¹¹ See the appendix for a detailed description of the dependent variables' calculation.

The **final** step is the inclusion of fixed effects using control variables. In that way we try to control for unobserved time-invariant firm characteristics. We follow Chordia et al. (2000) and Leuz and Verrecchia (2000) and control for firm size, share turnover and return variability which we use as main control variables. We additionally add further control variables following Doidge et al. (2004) and Lang et al. (2004) who control, among others, for firm size, financial leverage and asset growth. The relation to market liquidity for these variables is not that close. Therefore we cannot use them as main variables. Furthermore we add a market benchmark as control variable, following Daske et al. (2008). The market benchmark is computed as yearly mean of the dependent variable from the benchmark sample, excluding Germany, to truncate observations from a country that does mandate IFRS.

The variables are combined into the following two regression models.

First model:

$$DepVar_i = \beta_0 + \beta_1 Early Voluntary_i + \beta_2 Late Voluntary_i + \beta_3 First Time Mandatory_i + \beta_4 Early Voluntary Mandatory_i + \beta_5 Late Voluntary Mandatory_i + \sum \beta_j Controls_j + \varepsilon$$

Second model:

$$DepVar_i = \beta_0 + \beta_1 Early Voluntary Early After Mandatory_i + \beta_2 Early Voluntary Late After Mandatory_i + \beta_3 Late Voluntary Early After Mandatory_i + \beta_4 Late Voluntary Late After Mandatory_i + \beta_5 First Time Mandatory Early After Mandatory_i + \beta_6 First Time Mandatory Late After Mandatory_i + \sum \beta_j Controls_j + \varepsilon$$

DepVar stands for the different dependent variables *Zero Returns*, *Illiquidity*, *Total Trading Costs*, and *Bid-Ask Spreads*. We obtain the necessary data to estimate the model from Bloomberg, Datastream, Reuters, and the International Monetary Fund.

4. Empirical Results

4.1 Sample Selection and Description

In our sample we observe firms with fiscal years ending on or after January 1, 2001, through December 31, 2007. We start in 2001 to cover potential IFRS adoption effects. As treatment sample we choose all listed firms from Germany applying IFRS, provided that data is available and market capitalization is at least EUR 10 million. We choose the criteria of market capitalization because data from benchmark countries is in some cases not available for smaller firms and in this way the treatment and the control sample are better comparable. In the end, after dropping special (preferred) securities, our treatment sample consists of about 8,000 firm year observations from 774 unique firms. The firm year observations are split into 48% early voluntary, 33% late voluntary and 19% mandatory IFRS adoptions.

Selecting the control sample, we choose firms from Germany that have not yet adopted IFRS as well as firms from countries that have not switched to IFRS. Voluntary IFRS adopters from these countries are dropped. Using these countries as a benchmark, we concentrate on countries that show a similar GDP development to Germany for the entire investigation period. As base model we select, like Daske et al. (2008), the benchmark from a randomly drawn sample of up to 150 firms from each benchmark country.¹² This approach disallows strong effects from any particular country that might e.g. be due to country specific regulatory changes. Above all we run different sensitivity tests by varying the composition of the benchmark.

Concluding, we select from a sample that comprises more than 35,000 firm year observations from 2,125 unique firms. All the countries and the number of firms observed in the treatment and the control sample as well as the accounting standards are reported in Table 1. Table 2 provides a compendium of the potential countries for the control sample and the countries' GDP developments from the year 2001 to the year 2007. Table 3 presents descriptive statistics on the dependent and independent variables for the entire sample. We exclude values outside the 1% and the 99% percentile.

¹² When data is available for several thousand firms from one country (like Japan or the U.S), we sample these firms in advance keeping our benchmark base model definition in mind. We then download data for a sufficient number of firms (up to about 300), guaranteeing in that way that yearly data for at least 150 firms can be used for calculating.

4.2 Average Effects of IFRS Introduction Based on Firm Year Analyses

4.2.1 Univariate Analyses

First, we perform univariate comparisons to obtain an early impression of IFRS adoption effects. We calculate our dependent variables for market liquidity (proportion of zero return days, illiquidity, trading costs, and bid-ask spreads) for IFRS adopters and non-IFRS adopters from 2001 to 2007. We use t-tests to measure statistical significance for the resulting differences between the treatment and the control sample. In Table 4 we report the mean values for our variables and the differences between the treatment and the control sample over the years, indicating statistical significance at the 1%, 5% and 10% level with ***, **, and *, respectively. In average, the variables for liquidity show higher values for the IFRS adopter firms than for the non IFRS adopters. Furthermore, we clearly notice the trend for decreasing differences between the sample groups over the years. As the differences are quite big in the first years of the investigation, they strongly decrease in the years 2006 and 2007. During the last two years of our study, the variables for illiquidity and bid-ask spreads even show higher values of market liquidity for the non IFRS adopter firms. For instance, the percentage of *bid-ask spreads* in the year 2005 is 1.93% for IFRS adopters and it increases to 2.19% and 2.62% in the years 2006 and 2007, respectively. The opposite change takes place within the control sample. The bid-ask spreads decrease from 2.14% in 2005 to 1.77% in 2006 and to 1.72% in 2007. Consequently, in 2007, the bid-ask spreads are 0.90% higher for the IFRS adopter firms, statistically significant at the 1% level, indicating lower market liquidity. This sample is based on 490 IFRS adopters and 890 non IFRS adopters. The values are statistically significant at the 1% level.

Concluding, the univariate analysis of market liquidity suggests that advantages for IFRS adopters on the capital market decreased over the years, partially even resulting in disadvantages since the year 2006.

4.2.2 Analyses of Liquidity Consequences

4.2.3 Until Mandatory Adoption

In table 5 we present the results for the OLS coefficient estimates. The t-statistics in parentheses indicate statistical significance. For the liquidity variables the estimates are all negative with only one exception for the first time mandatory illiquidity variable. The values are predominantly statistically significant, clearly demonstrating the higher market liquidity for IFRS adopter firms in the years 2001 to 2005. Furthermore, we can report differences within the three adopter groups. In average, the market liquidity is higher for early voluntary

adopters than for late voluntary adopters and latter still show higher values than the first time mandatory adopters. For example, first time mandatory adopters' *proportion of zero return days* decreases by 155 basis points compared to the pre-adoption median of 27.94%. This is a diminution of 5,55%, significant at the 5% level. For early voluntary adopter firms, the proportion of zero return days goes down by 449 basis points in that time, even though they were already 324 basis points lower in the years before the mandatory change. Late voluntary adopters first decrease 256 basis points and after the adoption date further 288 basis points.¹³ The mentioned changes for early and late voluntary adopters are all significant at the 1% level. Concerning the *bid-ask spreads*, we can again see a stronger increase in market liquidity for voluntary adopters. Early voluntary adopters go up by 2% over the entire treatment period, significant at the 10% and 1% level for the first and second part of the period, respectively. Late voluntary adopters go up by 2.4%, significant at the 1% level for the entire period.

We also run different sensitivity analyses that we do not tabulate. We vary the benchmark definitions by excluding observations from Germany and US.GAAP observations, and by reducing the benchmark sample. In sum, the main conclusions do not need to be rejected, but significance and magnitude are sensitive to the benchmark, which underlines the concerns about the right choice of firms to evaluate the findings, as discussed in section 3.

Concluding, the hypothesis that firms with strong incentives – assuming voluntary adopters as firms with strong incentives – are to experience positive capital market effects, can be supported. Also the hypothesis, that mandatory adopter firms are to expect weaker capital market effects, as showing low or no incentives, can be confirmed. Compared to the time before the adoption became mandatory, voluntary adopters for all investigated variables experience an even stronger increase in market liquidity. This supports the hypothesis of positive effects through better comparability, when more firms apply IFRS.

In sum, all IFRS adopter firms show higher market liquidity values in average, compared to the non IFRS adopter firms, thereby marking stronger values for voluntary adopters. The results as well as the main control variables, which are market value, share turnover, and return variability, are statistically generally highly significant.

¹³The changes are calculated, for instance, as $e^{\ln(0,2794)-0,057} = 0,2639$ for first time mandatory adopters, and as $e^{\ln(0,2794)-0,123-0,201} = 0,2021$ for early voluntary mandatory adopters, respectively.

4.2.4 After Mandatory Adoption

In table 6 we report the effects for the time after the mandatory IFRS adoption year. Adoption effects or hurdles through the lack of comparability are supposed to be eliminated. What we see is what we partially could suggest through the first indications in the univariate analyses, but it is still surprising. Throughout all the liquidity variables we generally see the same pattern: a decrease of market liquidity (relative to the benchmark) compared to the time of the mandatory adoption¹⁴ and also a decrease compared to the time before the mandatory adoption¹⁵. As early voluntary adopters generally still maintain their advance over the benchmark sample, late voluntary adopters, especially for the time late after mandatory, lose their advance. For instance, compared to the median of 1.77% after the mandatory adoption year, the *bid-ask spread* of late voluntary adopters first increases 0.35 basis points (but not statistically significant) and further 1.37 basis points (significant at the 1% level) in the time late after mandatory. This equates to an augmentation of 0.97% in the bid-ask spreads variable. Regarding the *proportion of zero return days* for first time mandatory adopter firms, they first increase by 48 basis points and for the time late after mandatory by further 54 basis points, significant at the 10% and 5% level, respectively. This equates to an increase of 6,3% in the proportion of zero return days variable, relative to the zero return post-adoption median. The investigated variables are not always statistically significant. Especially the results for the late voluntary adopters cannot be definitely due to the IFRS effects. The main control variables (market value, share turnover, and return variability) are generally statistically highly significant.

Again, we run different sensitivity analyses and vary the benchmark definitions by e.g. excluding observations from Germany and US.GAAP observations. Here again the main assertions can be retained, but, as already mentioned in section 4.2.3., significance and magnitude are sensitive to the benchmark.

Concluding, the hypothesis that firms with strong incentives should experience stronger positive capital market effects can again be maintained. Results in the liquidity variables are always higher for voluntary adopters than for mandatory adopters. Surprisingly, the hypothesis that effects should generally be stronger in the years after the mandatory change, when interpreting and analysing difficulties are supposed to be minimised, cannot be confirmed. In contrast, the liquidity variables that showed strongly higher values before and

¹⁴ There is one exception. The early voluntary adopters' measure of illiquidity still slightly decreases compared to the time of the mandatory adoption.

¹⁵ Again the early voluntary adopters' measure of illiquidity is the exception. Further the early voluntary adopters' measure of trading costs is in the first year after the mandatory adoption slightly below the measure during the time before the mandatory adoption.

until the mandatory adoption year declined in the years after the mandatory adoption. The majority of the investigated variables even lost their advance relative to the benchmark sample. Possibly, on the long run conservative accounting, with all its possible disadvantages, remains the preferred reporting basis. This result may be strongly influenced by the volatile and fragile market conditions resulting from the financial crisis.

In sum, these liquidity results seem to demonstrate that after starting and interpreting difficulties are cured and the application of IFRS is established, investors prefer trading non IFRS adopter firms.

5. Conclusion

In this article we investigate the effects of the IFRS introduction focusing on market liquidity as effects in the change of quality of financial reporting are supposed to be measurable in this proxy.

For early voluntary adopters the effects are, in general, positive for the entire period. Advances relative to the benchmark sample vary from very strong advances during the first adoption years to very low advances, partially even disadvantages during the last years of the investigated period. The results for late voluntary adopters or mandatory adopters become even clearer. These adopter firms start the IFRS adoption in general with low advances relative to the benchmark sample and turn their advance into a disadvantage within a short time. The results are generally statistically significant and robust to various sensitivity checks. Magnitude and significance vary with the change of the benchmark definitions.

Concluding, mainly only early voluntary adopters showed significantly higher values for market liquidity over time. This suggests that either very committed adopters really do profit from IFRS or that these advances can be as well due to selection effects because firms adopting IFRS for such a long time before it was mandated are supposed to be innovative and rising. In the end, also market liquidity for early voluntary adopters declines. Therefore it seems, excluding short time effects, that investors prefer trading stocks from firms that adopt GAAP which is used and perhaps more appropriate to local market conditions. The results of this study may be strongly pushed through current market conditions and investors' probable preference towards conservative and cautious accounting.

This paper contributes to the political debate about risks and chances of IFRS and illustrates economic consequences of a forced GAAP adoption.

Appendix: Measurement of the Dependent Variables

A.1 Proportion of Zero Return Days

The first variable we use to measure the market liquidity is the proportion of zero returns. It reflects the proportion of trading days with zero daily stock returns out of all potential trading days in a given year. This measure is frequently used in finance studies.¹⁶ It is argued that investors only trade, if the value of information is worth more than the cost of trading¹⁷. Consequently, if firms applying the IFRS reporting standards are supposed to better transfer information, they should show less zero trading days.

When computing yearly values, we follow Daske et al. (2008) and define the measurement period from month -5 to month +7 relative to the firm's fiscal year end to account for IFRS information in interim reports and to ensure that the firms' annual reports are publicly available and priced at the time of computations.

We collect daily stock price and applied reporting standard data from Bloomberg, fiscal year end data from Reuters. We compared the applied reporting standard data from Datastream to the data from Bloomberg. Differences were investigated by looking up the firms' financial reports on the firms' websites.

A.2 Illiquidity (or Price Impact) Metric

The illiquidity measure, proposed by Amihud (2002) and, in turn, inspired by Kyle's (1985) lambda, is the daily ratio of absolute stock price return in percent to U.S. dollar volume. This measure gives the price impact of each dollar traded on the stock price. As tested in Amihud's (2002) study, the price impact or the return increases in illiquidity.¹⁸ This increase can be partially interpreted as premium to compensate for the lower liquidity of stocks relative to that of Treasury securities. Following, firms applying IFRS, considered as firms with liquid stocks, are supposed to have a lower return to trading volume ratio than the benchmark firms. Different from Amihud (2002) we calculate the illiquidity measure as the daily ratio of absolute stock price change in local currency to trading volume, again in local currency (and not each in USD). The advantage of this method is to avoid effects of variations in exchange rates between the U.S. dollar and foreign currency. Through this change, our resulting parameter will not be the exact price impact per each dollar traded. But as we use this measure to compare market liquidity relative to the benchmark firms, the modified method is

¹⁶ Goyenko et al. (2005), Lesmond (2005), Bekaert et al. (2006).

¹⁷ Lesmond et al. (1999).

¹⁸ see also e.g., Amihud and Mendelson (1986).

best for our research. When calculating the measure we use the yearly median of all daily ratios (multiplied 10,000). Again we define the measurement period from month -5 to month +7 relative to the firm's fiscal year end. We collect daily stock price, and trading volume data from Bloomberg, applied reporting standard data from Bloomberg and Datastream, and fiscal year end data from Reuters.

A.3 Lesmond et al. (1999) Total Trading Costs

Their model is based on the premise that if the value of the information signal is insufficient to exceed the costs of trading, then the marginal investor will either reduce trading or not trade, causing a zero return. Therefore, a security with high transaction costs will have less frequent price movements and more zero returns than a security with low transaction costs. Consequently the estimates from the model are the marginal trader's effective transaction costs. Lesmond et al. (1999) use the limited dependent variable (LDV) model of Tobin (1958) and Rosett (1959). They assume the common market model to be the correct model for security returns, but it is constrained by the effects of transaction costs and therefore the true return deviates from the measured return, when the value of information is too low to exceed the transaction costs. They demonstrate the relation between measured returns, R_{jt} , and true returns, R_{jt}^* , as

$$R_{jt}^* = \beta_j * R_{mt} + \epsilon_{jt},$$

where

$$\begin{aligned} R_{jt} &= R_{jt}^* - \alpha_{1j} & \text{if} & \quad R_{jt}^* < \alpha_{1j} \\ R_{jt} &= 0 & \text{if} & \quad \alpha_{1j} < R_{jt}^* < \alpha_{2j} \\ R_{jt} &= R_{jt}^* - \alpha_{2j} & \text{if} & \quad R_{jt}^* > \alpha_{2j}. \end{aligned}$$

The threshold for trades on negative information is α_{1j} and for positive information α_{2j} . Accordingly, if $\alpha_{1j} < \beta_j * R_{mt} + \epsilon_{jt} < \alpha_{2j}$, the measured return on the security will be zero because the true (negative) return is too small to exceed the transaction costs for selling and the true (positive) return is too small to exceed the transaction costs for buying. The market return is R_{mt} and the residual term to capture all further information not contained in the market return is ϵ_{jt} . Replacing these terms into the corresponding likelihood function (assumed that daily stock returns are normally distributed), calculating the logarithm of the likelihood function and finally maximizing the last mentioned solves the parameters of

interest, α_{1j} and α_{2j} . The measure of the total round trip transaction costs associated with security j is $\alpha_{2j} - \alpha_{1j}$. Assuming higher market liquidity for IFRS adopters, they are supposed to show lower transaction costs. We exercise these calculations for each firm and year using daily stock returns and equally weighted local market index returns. When computing yearly values, we again define the measurement period from month -5 to month +7 relative to the firm's fiscal year end. We also follow Lesmond (2005) and require at least 20% of the daily returns to be different from zero per firm-year observation.

Data of stock prices and the respective home country market index are obtained from Bloomberg, fiscal year end data from Reuters, and data of the applied reporting standards from Bloomberg and Datastream.

A.4 Bid-Ask Spreads

The variable for bid-ask spreads is the yearly median of daily quoted spreads, measured at the end of each trading day as the difference between the bid price and the ask price divided by the mid-point. This variable is frequently used in studies as measure for market liquidity (e.g., Amihud and Mendelson, 1986; Keim and Madhavan, 1996; Eleswarapu, 1997). Considering firms applying IFRS as firms with liquid stocks, they are supposed to have lower bid-ask spreads than the benchmark firms.

When computing yearly values, we again define the measurement period from month -5 to month +7 relative to the firm's fiscal year end. We collect applied reporting standards data from Bloomberg and Datastream, bid and ask price data from Bloomberg and fiscal year end data from Reuters.

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Table 1. Sample Composition

<i>Panel A: Firms per Country</i>			<i>Panel B: Accounting Standards per Year</i>				
Sample Countries	Unique Firms	<i>Firm-Years</i>	Year	Observations	US. GAAP	IFRS	Further GAAP
Germany	774	5418	2001	1285	13%	10%	77%
Japan	332	1050					
United States	186	1050	2002	1302	13%	11%	76%
Mexico	51	357					
Canada	252	1050	2003	1325	12%	14%	74%
Israel	100	700					
Brazil	204	1050	2004	1352	12%	23%	65%
New Zealand	117	819					
Chile	40	280	2005	1404	12%	28%	60%
Colombia	29	203					
Egypt	40	280	2006	1481	11%	31%	58%
			2007	1590	10%	33%	57%
Total	2125	12257	Total	9739	12%	22%	66%

Table 1. (Continued)

The sample period starts in 2001 and ends in 2007. As treatment sample we choose firms from Germany with a market capitalization of at least EUR 10 million. The benchmark sample consists of firms from non-IFRS adoption countries as well as firms from Germany that do not apply IFRS. For the selection of the benchmark countries see Table 2. When we gather data for the benchmark countries and data is available for several thousand firms from one country (like Japan or the U.S), we sample these firms in advance, keeping our benchmark base model definition in mind (a maximum of 150 firms per country). We then download data for only a sufficient number of firms, guaranteeing in that way that yearly data for at least 150 firms can be used for calculating. In Panel A we report the number of firms from each country. In Panel B the number and percentage of observations are reported for the entire sample per year, separating the sample into IFRS and U.S.GAAP observations. We obtain the necessary data to estimate the model from Bloomberg, Datastream, Reuters and the International Monetary Fund. For detailed data descriptions see the appendix.

Table 2. Benchmark Selection*Panel A: Gross Domestic Product (GDP), Constant Prices, Annual Percentage Change*

Non-IFRS Adoption									
Countries	2001	2002	2003	2004	2005	2006	2007	Sum	Mean
<i>Germany</i>	1.239	0.011	-0.269	1.058	0.763	2.882	2.534	8.218	1.174
Japan	0.184	0.262	1.414	2.744	1.934	2.424	2.107	11.069	1.581
United States	0.751	1.599	2.510	3.637	3.070	2.871	2.189	16.627	2.375
Mexico	-0.033	0.772	1.390	4.229	2.844	4.813	3.288	17.303	2.472
Canada	1.784	2.925	1.881	3.070	3.066	2.759	2.653	18.138	2.591
Israel	-0.426	-0.642	2.252	5.195	5.294	5.210	5.277	22.160	3.166
Brazil	1.132	2.658	1.147	5.716	3.158	3.754	5.417	23.160	3.309
New Zealand	2.703	5.187	3.449	4.528	2.785	1.546	2.993	23.191	3.313
Taiwan	-2.171	4.637	3.500	6.153	4.161	4.888	5.696	26.864	3.838
Argentina	-4.409	-10.895	8.837	9.030	9.179	8.466	8.659	28.867	4.124
Chile	3.527	2.159	3.972	5.984	5.714	3.966	5.008	30.330	4.333
Colombia	1.472	1.934	3.858	4.867	4.722	6.785	7.000	30.638	4.377
Egypt	3.524	3.186	3.193	4.092	4.472	6.844	7.088	32.399	4.628
Korea	3.837	6.970	3.097	4.730	4.198	5.134	4.973	32.939	4.706
Sri Lanka	-1.545	3.965	6.020	5.447	6.030	7.353	6.293	33.563	4.795
Turkey	-5.697	6.164	5.265	9.363	8.402	6.893	4.950	35.340	5.049
Thailand	2.167	5.318	7.140	6.344	4.526	5.107	4.753	35.355	5.051
Indonesia	3.643	4.499	4.780	5.031	5.693	5.510	6.316	35.472	5.067
Malaysia	0.518	5.391	5.789	6.783	4.997	5.934	6.327	35.739	5.106
Peru	0.215	5.020	4.032	5.111	6.745	7.557	8.986	37.666	5.381
Pakistan	1.982	3.224	4.846	7.369	7.667	6.920	6.381	38.389	5.484
Russia	5.100	4.700	7.300	7.200	6.400	7.400	8.100	46.200	6.600
India	3.886	4.555	6.857	7.885	9.130	9.746	9.213	51.272	7.325
China	8.300	9.100	10.000	10.100	10.400	11.100	11.400	70.400	10.057

Table 2. (Continued)

Panel B: Countries with closest GDP annual percentage difference per year compared to Germany

average closest country per year	2001	2002	2003	2004	2005	2006	2007	The ten closest countries compared per year and over the years
United States	Malaysia	Israel	Germany	Germany	Germany	New Zealand	Japan	Japan
Canada	United States	Germany	Brazil	Japan	Japan New Zealand	Japan	United States	United States
Japan	Germany	Japan	Mexico	Canada United States	Zealand	Canada United States	Germany	Mexico
Mexico	Brazil	Mexico United States	Japan	Canada	Mexico	Canada New Zealand	Canada New Zealand	Canada
Brazil	Colombia	States	Canada	Egypt	Canada United States	Germany	Zealand	Israel
Chile	Canada	Colombia	Israel United States	Mexico New Zealand	States	Brazil	Mexico	Brazil
Colombia	Pakistan	Chile			Brazil	Chile	Thailand	New Zealand
Israel								Chile
Egypt								Colombia
New Zealand								Egypt
Malaysia								
Pakistan								
Thailand								

Table 2. (Continued)

In Panel A we report the GDP for the possible benchmark countries that do not mandate IFRS for the years 2001 to 2007. The countries were chosen from Daske et al. (2008), table 1, that shows non IFRS adoption countries. GDP data is collected from the International Monetary Fund. In Panel B we show the countries that, per year, deviate the least from Germany's GDP. It is sufficient, to show six countries per year to obtain a final benchmark composition of ten countries. We can only select ten out of the twenty three tabulated countries to avoid unacceptable variances. As constant benchmark we choose the ten countries that in average over the years as well as in average compared per year showed the closest GDP percentage change compared to Germany.

Table 3. Descriptive Statistics for the Investigated Variables

	N	Mean	Std. Dev	P1	P25	Median	P75	P99
<i><u>Dependent Variables</u></i>								
Zero Returns	9.614	22.16%	23.63%	3.07%	6.15%	10.81%	29.89%	95.02%
Illiquidity	9.623	1.355	10.129	0.000	0.000	0.005	0.089	26.500
Total Trading Costs	9.093	3.86%	5.17%	0.51%	1.22%	2.02%	4.41%	24.59%
Bid-Ask Spreads	8.571	3.10%	7.45%	0.03%	0.62%	1.57%	3.39%	26.80%
<i><u>Independent Control Variables</u></i>								
Market Value	9.236	3,740	13,359	3	43	319	1,906	64,332
Share Turnover	9.236	0.777	2.643	0.002	0.129	0.398	0.887	5.215
Return Variability	9.576	0.026	0.017	0.008	0.016	0.022	0.031	0.086
Total Assets	9.439	10,119	62,068	0	63	373	2,622	182,696
Financial Leverage	9.056	0.559	0.238	0.043	0.398	0.568	0.720	0.999
Asset Growth	9.623	10.10%	38.31%	-68.75%	-1.97%	5.20%	16.31%	142.01%

Table 3. (Continued)

The sample period starts in 2001 and ends in 2007. As treatment sample we choose firms from Germany with a market capitalization of at least EUR 10 million. The benchmark sample consists of firms from non-IFRS adoption countries as well as firms from Germany that do not mandate the application of IFRS. For the selection of the benchmark countries see Table 2. We use proxies for market liquidity to reflect the quality of financial reporting. The proxies consist of four different variables: Zero Returns is the proportion of trading days with zero daily stock returns out of all potential trading days in a given year. Illiquidity or price impact is the yearly mean of a variation of the Amihud (2002) illiquidity measure i.e., daily absolute stock return divided by trading volume (we multiply the coefficient by 10,000 for expositional purpose). Total Trading Costs are a comprehensive estimate of yearly average round trip transaction costs based on a series of daily security and aggregate market returns, as developed by Lesmond et al. (1999). Bid-Ask Spreads are the yearly median of daily quoted spreads, measured at the end of each trading day as the difference between the bid price and the ask price divided by the mid-point. We define the control variables as follows: Market Value is stock price (in EUR) times the number of shares outstanding. We compute share turnover as annual EUR trading volume divided by market value of outstanding equity. Return variability is the annual standard deviation of daily stock returns (ln). Total assets are reported in EUR millions. Financial Leverage is the ratio of total liabilities to total assets. Asset Growth describes the one-year percentage change in total assets. Market Benchmark is defined as yearly mean of the dependent variable from observations in countries that do not mandate the adoption of IFRS (benchmark sample, excluded observations from Germany). We obtain the necessary data to estimate the model from Bloomberg, Datastream, Reuters and the International Monetary Fund. For detailed data descriptions see the appendix.

Table 4. Univariate Analyses

	2001			2002			2003			2004			2005			2006			2007		
zero return	IFRS Adopters N=122	(i)	16.89%	IFRS Adopters N=142	(i)	19.7%	IFRS Adopters N=175	(i)	14.19%	IFRS Adopters N=297	(i)	15.14%	IFRS Adopters N=373	(i)	14.13%	IFRS Adopters N=441	(i)	14.43%	IFRS Adopters N=479	(i)	16.07%
	Non IFRS Adopters N=1145	(ii)	31.00%	Non IFRS Adopters N=1121	(ii)	30.39%	Non IFRS Adopters N=1098	(ii)	26.76%	Non IFRS Adopters N=979	(ii)	22.51%	Non IFRS Adopters N=952	(ii)	19.2%	Non IFRS Adopters N=953	(ii)	15.97%	Non IFRS Adopters N=1007	(ii)	16.88%
	(i)-(ii)		14.11%***	(i)-(ii)		10.69%***	(i)-(ii)		12.57%***	(i)-(ii)		7.37%***	(i)-(ii)		5.07%***	(i)-(ii)		1.54%*	(i)-(ii)		0.81%
illi- quidity	IFRS Adopters N=122	(i)	3.938	IFRS Adopters N=145	(i)	5.235	IFRS Adopters N=176	(i)	3.148	IFRS Adopters N=310	(i)	3.691	IFRS Adopters N=382	(i)	5.179	IFRS Adopters N=447	(i)	7.528	IFRS Adopters N=490	(i)	11.606
	Non IFRS Adopters N=1141	(ii)	5.897	Non IFRS Adopters N=1137	(ii)	7.563	Non IFRS Adopters N=1123	(ii)	6.656	Non IFRS Adopters N=999	(ii)	5.342	Non IFRS Adopters N=955	(ii)	6.171	Non IFRS Adopters N=959	(ii)	7.282	Non IFRS Adopters N=1031	(ii)	5.758
	(i)-(ii)		1.959*	(i)-(ii)		2.328**	(i)-(ii)		3.508***	(i)-(ii)		1.651*	(i)-(ii)		0.992	(i)-(ii)		-0.246	(i)-(ii)		-5.848***
trading costs	IFRS Adopters N=122	(i)	5.05%	IFRS Adopters N=143	(i)	5.84%	IFRS Adopters N=177	(i)	3.69%	IFRS Adopters N=300	(i)	3.30%	IFRS Adopters N=370	(i)	2.61%	IFRS Adopters N=437	(i)	2.42%	IFRS Adopters N=476	(i)	3.21%
	Non IFRS Adopters N=1023	(ii)	5.15%	Non IFRS Adopters N=1040	(ii)	5.40%	Non IFRS Adopters N=1050	(ii)	4.29%	Non IFRS Adopters N=942	(ii)	3.33%	Non IFRS Adopters N=908	(ii)	2.62%	Non IFRS Adopters N=920	(ii)	2.25%	Non IFRS Adopters N=993	(ii)	2.53%
	(i)-(ii)		0.10%	(i)-(ii)		-0.44%	(i)-(ii)		0.60%***	(i)-(ii)		0.03%	(i)-(ii)		0.01%	(i)-(ii)		-0.17%	(i)-(ii)		-0.68%***
bid-ask spread	IFRS Adopters N=122	(i)	3.32%	IFRS Adopters N=144	(i)	3.5%	IFRS Adopters N=175	(i)	3.07%	IFRS Adopters N=309	(i)	2.11%	IFRS Adopters N=381	(i)	1.93%	IFRS Adopters N=446	(i)	2.19%	IFRS Adopters N=490	(i)	2.62%
	Non IFRS Adopters N=943	(ii)	3.60%	Non IFRS Adopters N=999	(ii)	3.67%	Non IFRS Adopters N=983	(ii)	3.19%	Non IFRS Adopters N=862	(ii)	2.4%	Non IFRS Adopters N=815	(ii)	2.14%	Non IFRS Adopters N=816	(ii)	1.77%	Non IFRS Adopters N=890	(ii)	1.72%
	(i)-(ii)		0.28%	(i)-(ii)		0.17%	(i)-(ii)		0.12%	(i)-(ii)		0.29%**	(i)-(ii)		0.21%*	(i)-(ii)		-0.42%***	(i)-(ii)		-0.90%***

Table 4. (Continued)

The table reports the mean values for the dependent variables, the number of observations and the differences between the treatment and the control sample from the year 2001 to 2007, indicating statistical significance at the 1%, 5% and 10% level with ***, **, and *, respectively, based on the approximative two-sided t-test from Gauß. The treatment sample consists of all German firms, applying IFRS, with a market capitalization of at least EUR 10 million. The benchmark companies are randomly selected from the benchmark countries. A maximum of 150 companies per country is selected. The dependent variables are: (1) Zero Returns is the proportion of trading days with zero daily stock returns out of all potential trading days in a given year. (2) Illiquidity or price impact is the yearly mean of a variation of the Amihud (2002) illiquidity measure i.e., daily absolute stock return divided by trading volume. (3) Total Trading Costs are a comprehensive estimate of yearly average round trip transaction costs based on a series of daily security and aggregate market returns, as developed by Lesmond et al. (1999). (4) Bid-Ask Spreads are the yearly median of daily quoted spreads, measured at the end of each trading day as the difference between the bid price and the ask price divided by the mid-point. We obtain the necessary data to estimate the model from Bloomberg, Datastream, Reuters and the International Monetary Fund. For detailed data descriptions see the appendix.

Table 5. Regression Analyses Until Mandatory Adoption*Independent Variables*

	Proportion of Zero Return Days	Illiquidity	Total Trading Costs	Bid-Ask Spread
<i>IFRS Adopters</i>				
Early Voluntary	-0.123*** (-11.292)	-0.252** (-2.535)	-0.002 (-0.914)	-0.003* (-1.859)
Late Voluntary	-0.096*** (-5.392)	-0.147 (-0.906)	-0.010*** (-2.862)	-0.010*** (-3.446)
First Time Mandatory	-0.057** (-1.995)	1.059*** (3.965)	-0.008 (-1.322)	-0.008* (-1.674)
Early Voluntary Mandatory	-0.201*** (-9.709)	-0.478** (-2.546)	-0.026*** (-6.659)	-0.017*** (-4.721)
Late Voluntary Mandatory	-0.120*** (-6.179)	-0.220 (-1.253)	-0.019*** (-4.920)	-0.014*** (-4.309)

Table 5. (Continued)

<i>Control Variables</i>					
Log (Market Value t-1)	-0.056*** (-25.733)	0.063** (2.433)	-0.008*** (-18.187)	-0.009*** (-18.858)	
Log (Share Turnover t-1)	-0.054*** (-37.310)	-0.310*** (-17.349)	-0.007*** (-23.565)	-0.005*** (-16.372)	
Log (Return Variability t-1)	-0.072*** (-14.712)	-0.091 (-1.489)	0.024*** (22.395)	0.014*** (13.563)	
Log (Total Assets)	-0.002 (-1.077)	-0.245*** (-9.169)	-0.001 (-1.477)	0.002*** (4.459)	
Financial Leverage	0.041*** (3.647)	0.910*** (6.475)	0.013*** (5.682)	0.004* (1.759)	
Asset Growth	-0.013 (-1.604)	-0.303*** (-2.951)	-0.011*** (-6.700)	-0.006*** (-3.499)	
Market Benchmark	0.955*** (11.417)	0.961 (0.331)	0.641*** (10.873)	0.443*** (5.294)	
R	0.728	0.336	0.696	0.547	
R square	0.530	0.113	0.484	0.300	

Table 5. (Continued)

The sample period starts in 2001 and ends in 2007. As treatment sample we choose firms from Germany with a market capitalization of at least EUR 10 million. The benchmark sample consists of firms from non-IFRS adoption countries as well as firms from Germany that do not mandate the application of IFRS. For the selection of the benchmark countries see Table 2. We split the IFRS observations into three groups: (1) Early Voluntary comprises the firms switching to IFRS between the years 2001 and 2002. (2) Late Voluntary includes all firms switching to IFRS between the years 2003 and 2004. (3) First time mandatory marks all firms applying IFRS for the first time in 2005, the year when it became mandatory in Germany. Early Voluntary Mandatory and Late Voluntary Mandatory refer to the Early and Late Voluntary adopters' performance in the year 2005. We use proxies for market liquidity to reflect the quality of financial reporting. The proxies consist of four different variables: Zero Returns is the proportion of trading days with zero daily stock returns out of all potential trading days in a given year. Illiquidity or price impact is the yearly mean of a variation of the Amihud (2002) illiquidity measure i.e., daily absolute stock return divided by trading volume (we multiply the coefficient by 10,000 for expositional purpose). Total Trading Costs are a comprehensive estimate of yearly average round trip transaction costs based on a series of daily security and aggregate market returns, as developed by Lesmond et al. (1999). Bid-Ask Spreads are the yearly median of daily quoted spreads, measured at the end of each trading day as the difference between the bid price and the ask price divided by the mid-point. We define the control variables as follows: Market Value is stock price (in EUR) times the number of shares outstanding. We compute share turnover as annual EUR trading volume divided by market value of outstanding equity. Return variability is the annual standard deviation of daily stock returns. Total assets are reported in EUR millions. Financial Leverage is the ratio of total liabilities to total assets. Asset Growth describes the one-year percentage change in total assets. Market Benchmark is defined as yearly mean of the dependent variable from observations in countries that do not mandate the adoption of IFRS (benchmark sample, excluded observations from Germany). For the first four mentioned control variables we use the natural log of the raw values. Where indicated, we lag the variables by one year. Statistical significance is indicated at the 1%, 5% and 10% level with ***, **, and *, respectively, based on the approximative two-sided t-test from Gauß (t-statistics in parentheses). We obtain the necessary data to estimate the model from Bloomberg, Datastream, Reuters and the International Monetary Fund. For detailed data descriptions see the appendix.

Table 6. Regression Analyses After Mandatory Adoption*Independent Variables*

	Proportion of Zero Return Days	Illiquidity	Total Trading Costs	Bid-Ask Spread
<i>IFRS Adopters</i>				
Early Voluntary Early After Mandatory	-0.065*** (-4.325)	-0.483* (-1.851)	-0.005*** (-2.659)	0.002 (0.919)
Early Voluntary Late After Mandatory	-0.048*** (-3.098)	-0.285 (-1.084)	-0.001 (-0.253)	0.005*** (2.564)
Late Voluntary Early After Mandatory	-0.015 (-1.067)	-0.071 (-0.292)	-0.001 (-0.394)	0.003 (1.442)
Late Voluntary Late After Mandatory	0.003 (0.181)	0.385 (1.576)	0.007*** (3.388)	0.007*** (3.780)
First Time Mandatory Early After Mandatory	0.029* (1.878)	1.566*** (5.799)	0.008*** (3.795)	0.009*** (4.232)
First Time Mandatory Late After Mandatory	0.032** (2.423)	1.638*** (6.939)	0.017*** (9.086)	0.013*** (7.405)

Table 6. (Continued)

Control Variables

Log (Market Value t-1)	-0.037*** (-15.394)	0.157*** (2.951)	-0.003*** (-9.130)	-0.003*** (7.674)
Log (Share Turnover t-1)	-0.050*** (-31.621)	-0.606*** (-17.365)	-0.005*** (-21.221)	-0.005*** (-23.162)
Log (Return Variability t-1)	-0.009 (-1.452)	0.474*** (3.332)	0.014*** (14.365)	0.011*** (11.538)
Log (Total Assets)	-0.002 (-0.808)	-0.372*** (-7.332)	-0.002*** (-4.570)	-0.002*** (-4.561)
Financial Leverage	0.023* (1.846)	1.700*** (6.159)	0.014*** (7.612)	0.006*** (3.443)
Asset Growth	-0.026*** (-5.054)	-0.202* (-1.709)	-0.004*** (-4.580)	-0.003 (-3.891)
Market Benchmark	25.596 (1.169)	20.095* (1.659)	1.190*** (3.883)	-1.008* (-1.857)
R	0.694	0.414	0.659	0.620
R square	0.482	0.172	0.434	0.385

Table 6. (Continued)

The sample period starts in 2001 and ends in 2007. As treatment sample we choose firms from Germany with a market capitalization of at least EUR 10 million. The benchmark sample consists of firms from non-IFRS adoption countries as well as firms from Germany that do not mandate the application of IFRS. For the selection of the benchmark countries see Table 2. We split the IFRS observations into three groups: (1) Early Voluntary comprises the firms switching to IFRS initially between the years 2001 and 2002. (2) Late Voluntary includes all firms switching to IFRS between the years 2003 and 2004. (3) First time mandatory marks all firms applying IFRS for the first time after it became mandatory in Germany. We examine these groups for the time after the mandatory IFRS adoption year. We differentiate between reportings that were announced early after mandatory and late after mandatory, which refers to the second and third yearly financial statements, respectively, after the adoption of IFRS became mandatory. We use proxies for market liquidity to reflect the quality of financial reporting. The proxies consist of four different variables: Zero Returns is the proportion of trading days with zero daily stock returns out of all potential trading days in a given year. Illiquidity or price impact is the yearly mean of a variation of the Amihud (2002) illiquidity measure i.e., daily absolute stock return divided by trading volume (we multiply the coefficient by 10,000 for expositional purpose). Total Trading Costs are a comprehensive estimate of yearly average round trip transaction costs based on a series of daily security and aggregate market returns, as developed by Lesmond et al. (1999). Bid-Ask Spreads are the yearly median of daily quoted spreads, measured at the end of each trading day as the difference between the bid price and the ask price divided by the mid-point. We define the control variables as follows: Market Value is stock price (in EUR) times the number of shares outstanding. We compute share turnover as annual EUR trading volume divided by market value of outstanding equity. Return variability is the annual standard deviation of monthly stock returns. Total assets are reported in EUR millions. Financial Leverage is the ratio of total liabilities to total assets. Asset Growth describes the one-year percentage change in total assets. Market Benchmark is defined as yearly mean of the dependent variable from observations in countries that do not mandate the adoption of IFRS (benchmark sample, excluded observations from Germany). For the first four mentioned control variables we use the natural log of the raw values. Where indicated, we lag the variables by one year. Statistical significance is indicated at the 1%, 5% and 10% level with ***, **, and *, respectively, based on the approximative two-sided t-test from Gauß (t-statistics in

parentheses). We obtain the necessary data to estimate the model from Bloomberg, Datastream, Reuters and the International Monetary Fund. For detailed data descriptions see the appendix.