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*The impact of transitions from U.S. GAAP to IFRS on the decision usefulness of accounting
information – an empirical analysis*

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List of abbreviations

EC	European Commission
E.g.	Exempli gratia (for example)
ERC	Earnings response coefficient
Et al.	Et alii (and others)
EU	European Union
FASB	Financial Accounting Standards Board
I.e.	Id est (that is)
IAS	International Accounting Standard(s)
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standard(s)
Max	Maximum
Min	Minimum
N	Number
P.	Page
Pp.	Pages
SEC	Securities and Exchange Commission
SIC	Standard industrial classification
S.d.	Standard deviation
U.S.	United States (of America)
U.S. GAAP	United States Generally Accepted Accounting Principles
Vol.	Volume

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1. Introduction

This thesis addresses an important concept in financial reporting: the decision usefulness of financial statements. Decision usefulness means that financial reporting conveys information to users of financial statements that is needed or useful to make economic decisions (Scott (2012)). The IFRS and U.S. GAAP are chosen as setting for this thesis as both accounting systems pursue a decision usefulness approach. The standard setters IASB and FASB state in their common conceptual framework that *“the objective of general purpose financial reporting is to provide financial information about the reporting entity that is useful to existing and potential investors, lenders and other creditors in making decisions about providing resources to the entity”* (IASB and FASB (2010), OB2). This statement shows that capital providers are regarded the primary users of financial reporting information. Hence, with reference to the common conceptual framework Scott (2012) states that *“the primary decision addressed in the Framework is the investment decision in firms’ shares or debt”* (Scott (2012), p. 92). Changes in the usefulness of financial reporting information change the information set available to investors. This might affect investors’ decisions and hence induce economic consequences as defined by Zeff (1978). Accordingly, Brüggemann et al. (2012) state that *“financial reporting potentially affects firm values by influencing the information set of current and potential investors”* (Brüggemann et al. (2012), p. 6).

I analyze two important factors that influence the decision usefulness of financial reporting information: informativeness and comparability (e.g. Dechow et al. (2010); Hail et al. (2010a)). Informativeness is a proxy for the ability of financial statements to capture or summarize information (Francis

and Schipper (1999)). The better financial statements capture or summarize information, the less noise is contained in financial information, implying an improved reflection of underlying economics.

In the common conceptual framework of the IASB and FASB comparability is regarded as a qualitative characteristic that enhances the usefulness of information. It helps users of financial information to decide between investment alternatives. Comparability implies that similar economic events are reflected similarly in accounting outcomes and different economic events are reflected dissimilar.

This thesis investigates the effects of an important factor determining the informativeness and comparability of financial statements; accounting standards. Specifically, I investigate the effects of a transition from U.S. GAAP to IFRS on informativeness and comparability of financial statements. A large body of literature investigating the consequences of IFRS adoption exists and is reviewed by Soderstrom and Sun (2007) on voluntary IFRS adoption and Brüggemann et al. (2012) on mandatory IFRS adoption. However, the empirical studies presented in this thesis are the first to investigate a transition from U.S. GAAP to IFRS. This is different from other studies investigating effects induced by differences between the two sets of accounting standards (e.g. Bartov et al. (2005); Leuz (2003)). These studies compare different firms applying either U.S. GAAP or IFRS. A study analyzing a transition from one system to the other has the advantage that firms can be used as their own controls in a pre- and post-adoption comparison.

Prior research has shown that not only accounting standards shape properties of financial statements. Also incentives are an important factor (e.g. Ball et al. (2000); Burgstahler et al. (2006); Christensen et al. (2008)). The

empirical studies contained in this thesis isolate the effect of changing accounting standards from accounting incentives. I exploit the unique setting of Germany where publicly traded firms had permission to adopt U.S. GAAP or IFRS before mandatory adoption of IFRS in the European Union from 2005 onwards (EC (2002)). Aside from the advantage that institutional factors are held constant by focusing the analyses on a single country, a control group of German firms that constantly apply IFRS throughout all analyzed periods is used to control for effects from changing incentives over time. Hence, the setting of Germany allows isolating effects induced by differences between U.S. GAAP and IFRS from others.

The effects upon a transition from U.S. GAAP and IFRS are especially relevant for three reasons. First, the standard setters IASB and FASB are committed to converge U.S. GAAP and IFRS since 2002 (FASB and IASB (2002)). If informativeness and comparability change upon a transition from U.S. GAAP to IFRS, differences in the two sets of accounting standards still have an impact on properties of financial statements implying that further convergence efforts are important.

Second, the European Commission required mandatory adoption of IFRS in the European Union from 2005 onwards. A major objective was to enhance comparability of financial statements. The empirical studies contained in this thesis test if this objective has also been achieved for firms that voluntarily decided to adopt U.S. GAAP before mandatory adoption of IFRS and which effects informativeness occurred for these firms. In addition, the review study on comparability contained in this thesis summarizes other studies assessing changes in comparability and resulting effects upon

mandatory adoption of IFRS in the European Union. The results are especially relevant for European regulators.

Third, the Securities and Exchange Commission (SEC) currently considers mandatory adoption of IFRS in the US (SEC (2008)). Effects induced by a change in accounting standards from U.S. GAAP to IFRS are hence of importance for US regulators and practitioners. Similarly to the European Commission, the SEC promulgates IFRS adoption with the goal to improve comparability of financial information. However, the effects of a transition from U.S. GAAP to IFRS have not been assessed yet.

The assessment of financial statement comparability is a further issue in empirical research that is addressed in the third study contained in this thesis. Although it is one of the objectives followed by researchers and regulators with increased proliferation of IFRS (e.g. SEC (2008); EC (2002); Barth (2008)), comparability is an elusive concept that is not always precisely defined and challenging to measure empirically. My third study aims to document and to structure the different concepts of comparability and the measures of comparability that evolved in empirical research.

This thesis comprises five chapters, an introduction, two empirical studies, one review study and a conclusion. I provide separate lists of references and appendices for each chapter and all studies are written in the first person plural to anticipate further development of the studies and submission to peer-reviewed journals. I summarize the three studies in the following and add acknowledgements for helpful comments and suggestions.

The first study is named “*Transition from U.S. GAAP to IFRS – effects on earnings informativeness*” and is the first to investigate whether a transition from reporting under U.S. GAAP to reporting under IFRS affects firms’

financial reporting properties, providing such evidence on one specific property: earnings informativeness.¹ We exploit the unique setting of the German capital market: Our treatment group is composed of firms that reported under U.S. GAAP before being required by European law to adopt IFRS, and our control group is a matched sample of German firms that reported under IFRS throughout our analysis period (2001-2010). This difference-in-differences research design allows us to hold constant institutional factors and reporting incentives in order to isolate the effect of IFRS adoption on U.S. GAAP firms' earnings informativeness. Taking advantage of hand-collected data from required U.S. GAAP-to-IFRS reconciliations, we find a significant increase in earnings informativeness for a subsample of firms with large relative de facto differences between U.S. GAAP and IFRS net incomes. However, we fail to find a significant average effect for the full sample. These results are consistent with IFRS adoption impacting financial reporting properties, but only where firms are materially affected by the differences between the two sets of reporting standards. Our findings contribute to the debate on IFRS adoption in the U.S. by helping regulators to assess the potential effects of a transition from U.S. GAAP to IFRS on the properties of adopters' financial statements, and by pointing towards reporting issues where convergence has not yet been achieved.

We appreciate helpful comments and suggestions from Keryn Chalmers, Nils Crasselt, Rolf Uwe Fülbier, Joachim Gassen, Igor Goncharov, Martin Jacob, Rashad Abdel-Khalik, Maximilian Müller, Bernhard Pellens, Grace Pownall, Wolfgang Schultze, Holger Theßeling, Burcin Yurtoglu,

¹ The chapter is based on the paper of Hahn, S. and Sellhorn, T. (2012). „Transition from U.S. GAAP to IFRS – effects on earnings informativeness“. Working Paper, WHU – Otto Beisheim School of Management.

Jochen Zimmermann and workshop participants at University of Augsburg, Humboldt-University Berlin, WHU – Otto Beisheim School of Management and the 2011 EAA Annual Congress.

The second study “*Comparability between financial statements prepared under U.S. GAAP and IFRS*” investigates if a group of firms that transition from U.S. GAAP to IFRS becomes more comparable to a matched group of firms constantly following IFRS, comparing pre- and post-IFRS adoption periods in a difference-in-differences setting.² In addition we provide extensive descriptive statistics on reconciliations from U.S. GAAP to IFRS income and book value of equity, providing insights into existing de-facto differences between the two sets of accounting standards. We find significant increases in comparability between our two groups of firms after firms transitioned from U.S. GAAP to IFRS. Our findings suggest that common use of IFRS instead of parallel use of U.S. GAAP or IFRS is beneficial to comparability between firms. The findings are of relevance for the ongoing convergence process between the IASB and the FASB and the SEC that considers mandatory adoption of IFRS in the United States to enhance comparability between US and non-US firms.

We appreciate helpful comments and suggestions from Igor Goncharov, Allan C. Hodgson, Laurence van Lent, Maximilian Müller, Caspar David Peter, Edward Riedl and workshop participants at Schumpeter School of Business and Economics Wuppertal and WHU – Otto Beisheim School of Management.

² The chapter is based on the paper of Hahn, S. and Sellhorn, T. (2012). „Comparability between financial statements prepared under US GAAP and IFRS“. Working Paper, WHU – Otto Beisheim School of Management.

The third study “*Empirical accounting comparability studies – A review*” documents empirical evidence on determinants and consequences of accounting comparability, it discusses the different concepts of comparability and measures applied in empirical research to grasp them empirically.³ We differentiate between two perspectives on accounting comparability, an input- and an output-perspective, and relate them to the views of standard setters. Studies assessing consequences of accounting comparability often use special settings to isolate the effects of comparability. Most of these studies find effects induced by changes in comparability upon adoption of IFRS. Surprisingly, there is ambiguous evidence from determinants studies that comparability changes after adoption of IFRS. We suggest the further development of direct measures to assess comparability from an output-perspective and the increased application of these measures in consequences studies.

We appreciate helpful comments and suggestions from Maximilian Müller.

³ The chapter is based on the paper of Hahn, S. and Sellhorn, T. (2012). „Empirical accounting comparability studies – A review“. Working Paper, WHU – Otto Beisheim School of Management.

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2. Transition from U.S. GAAP to IFRS – effects on earnings informativeness

2.1. Introduction

After several years of ongoing convergence between International Financial Reporting Standards (IFRS) and U.S. Generally Accepted Accounting Principles (GAAP), the U.S. Securities and Exchange Commission (SEC) keeps postponing its decision about the future role of IFRS in the U.S. One of the reasons for its hesitation lies in the uncertainty about the effects of IFRS adoption on the properties of U.S. firms' financial statements (Hail et al. (2010a)). This paper is the first to provide direct evidence on such effects, focusing on the impact of a transition from U.S. GAAP to IFRS on earnings informativeness.

Several studies emphasize the importance of incentives for financial statement properties (e.g. Ball et al. (2000); Leuz et al. (2003); Burgstahler et al. (2006); Christensen et al. (2007); Cascino and Gassen (2010); Hail et al. (2010a)). When analyzing the effects of adopting a different set of financial reporting standards on the properties of financial statements, researchers' challenge is to control for the effects of institutional factors and reporting incentives changing simultaneously (e.g. Ball et al. (2000); Ball (2006), Daske et al. (2008); Daske et al. (2011)). We exploit the unique setting of Germany, where publicly traded firms were allowed to adopt U.S. GAAP or IFRS since the late 1990s¹, and then were mandated to switch to IFRS in 2005. This setting has several advantages: First, we are able to observe actual IFRS transitions being undergone by firms preparing their financial statements under

¹ Specifically, these firms were permitted to prepare their consolidated financial statements under a set of "internationally accepted standards", where IFRS and U.S. GAAP were perceived as such sets of standards.

U.S. GAAP. Second, by confining our analysis to a single country, we hold constant institutional factors shown in prior research (e.g. Ball (2006); Daske et al. (2008)) to affect financial statement properties. Third, we are able to separate the effects of changing standards from changing institutions and incentives over time by using as a control group those firms that applied IFRS throughout our analysis period of 2001-2010, in addition to using our sample firms as their own controls. This paper is thus the first to investigate directly whether a transition from U.S. GAAP to IFRS affects a specific property of financial reporting: earnings informativeness.

We conduct earnings informativeness tests to investigate the ability of financial statements prepared under two different sets of accounting standards to capture or summarize information (Francis and Schipper (1999)). Different sets of accounting standards convey information to investors to a different extent. Financial statements are more informative the less noise is contained in the accounting information. We argue that opportunities for earnings management and existing differences between U.S. GAAP and IFRS potentially add a different extent of noise to earnings, and consequently have the potential to affect the informativeness of earnings.

We find a significant increase in earnings informativeness after transition to IFRS for U.S. GAAP firms that have the largest relative de facto differences between U.S. GAAP and IFRS net incomes. However, we observe no changes in earnings informativeness after transition to IFRS for the entire sample. These results are consistent with IFRS adoption impacting financial reporting properties, but only where firms are materially affected by the differences between the two sets of reporting standards.

Our study contributes to two main strands of prior literature. First, we add to a body of research on the economic consequences of international differences in accounting standards. Assessing the impact of accounting standards, given cross-country variation in institutions, requires settings in which one of these factors is held constant while the other varies. Researchers have attempted this by exploiting (1) reconciliations of income and equity from domestic GAAP to U.S. GAAP provided to the SEC by foreign issuers on form 20-F; (2) transitions from domestic GAAP to IFRS; and (3) cross-sectional comparisons of groups of firms concurrently applying different sets of accounting standards within the same institutional environment. All of these studies face similar research design issues that our setting allows us to mitigate. By using actual transitions from U.S. GAAP to IFRS, this paper is the first to provide evidence on the effect of a transition from reporting under U.S. GAAP to reporting under IFRS on financial statement properties. Second, we contribute to prior research on earnings response coefficients and earnings informativeness by analyzing how a wholesale accounting regime shift, i.e. a switch from U.S. GAAP to IFRS, affects earnings informativeness, i.e. the ability of earnings to capture or summarize information.

Our results are relevant for the ongoing debate in the U.S. on mandatory adoption of IFRS for domestic firms (e.g. Hail et al. (2010a); Hail et al. (2010b)) considered by the SEC (SEC (2008)). Also, the convergence process between IFRS and U.S. GAAP (FASB and IASB (2002)) is still ongoing. The effects of existing differences between the accounting systems are of special interest. If earnings informativeness changes when firms transition from U.S. GAAP to IFRS, implications can be drawn for the

progress of convergence efforts and effects upon mandatory IFRS adoption in the U.S.

This paper is organized as follows: In section 2, we first describe our setting and the current debate on IFRS adoption in the U.S.. We then place our study in the context of the related literature and derive our hypotheses. Section 3 describes our research design and sample. Empirical results are presented in section 4, and robustness checks in section 5. Section 6 concludes.

2.2. Background, related literature and hypotheses

2.2.1. The German setting

From 1998, German publicly traded firms were permitted to substitute ‘internationally accepted accounting standards’ for German GAAP in preparing their consolidated financial statements, with IFRS and U.S. GAAP being regarded as such standards. Table 1 shows that 646 German firms adopted IFRS between 1996 and 2007, whereas 108 firms decided using U.S. GAAP. Only 1.7% out of the 646 firms constantly following IFRS adopted IFRS before 2000, compared to 30.56% of the 108 firms adopting U.S. GAAP.

In 2002, the European Union issued Regulation (EC) 1606/2002 (EC (2002)), requiring mandatory IFRS adoption in the consolidated accounts of all publicly traded EU firms from 2005 onwards.² Consequently, German firms that previously had chosen to report under U.S. GAAP were required to adopt IFRS starting in 2005. Table 1 shows that these transitioning firms switched to IFRS between the years 2003 and 2008. This unique setting allows us to investigate the effect of IFRS adoption on the financial reporting properties of

² The IAS Regulation permitted firms using U.S. GAAP to defer application of IFRS until the end of 2007. A similar grandfathering option was afforded firms having only publicly traded debt (but no equity) securities.

U.S. GAAP firms using a difference-in-differences design: Our ‘treatment group’ consists of U.S. GAAP firms that switched to IFRS when it became mandatory, whereas firms using IFRS throughout our analysis period serve as a ‘control group’.

Table 1: German IFRS and U.S. GAAP adopters and U.S. GAAP to IFRS transitions

Year	IFRS adopter			U.S. GAAP adopter			U.S. GAAP to IFRS transitions		
	Frequency	Percent	Cumulative	Frequency	Percent	Cumulative	Frequency	Percent	Cumulative
1995	-	-	-	2	1.85	1.85	-	-	-
1996	1	0.15	0.15	0	0	1.85	-	-	-
1997	4	0.62	0.77	8	7.41	9.26	-	-	-
1998	1	0.15	0.93	5	4.63	13.89	-	-	-
1999	5	0.77	1.70	18	16.67	30.56	-	-	-
2000	14	2.17	3.87	41	37.96	68.52	-	-	-
2001	22	3.41	7.28	13	12.04	80.56	-	-	-
2002	66	10.22	17.49	19	17.59	98.15	-	-	-
2003	101	15.63	33.13	2	1.85	100	6	5.56	5.56
2004	123	19.04	52.17	-	-	-	23	21.30	26.85
2005	212	32.82	84.98	-	-	-	60	55.56	82.41
2006	69	10.68	95.67	-	-	-	13	12.04	94.44
2007	28	4.33	100	-	-	-	4	3.70	98.15
2008	-	-	-	-	-	-	2	1.85	100
Total	646	100	-	108	100	-	108	100	-

This table presents descriptive statistics on the time point of adoption of an international accounting system by German firms. The first column shows the year of adoption. The second column labeled “IFRS adopter” presents the number of German firms adopting IFRS in a particular year. The third column labeled “U.S. GAAP adopter” presents the number of German U.S. GAAP adopter in a particular year. The fourth column labeled “U.S. GAAP to IFRS transitions” presents the number of German firms that transition from U.S. GAAP to IFRS. We use the variable “accounting system followed” from the Datastream database (07536) to derive the presented data.

2.2.2. The road towards IFRS in the U.S.

The SEC is considering adoption of IFRS in the U.S., consistent with the objective of a single set of global accounting standards. The abandonment, in 2007, of 20-F reconciliations for foreign issuers reporting under IFRS was a major step in this direction,³ which fueled the debate about IFRS adoption in the U.S.. In November 2008, the SEC issued a ‘Roadmap’ for the potential adoption of IFRS in the U.S. (SEC (2008)), which states that mandatory adoption would be considered in 2011. In 2010, the SEC issued a Work Plan (SEC (2010)), confirming its commitment to deciding on the incorporation of IFRS into the U.S. financial reporting system in 2011. Today, this decision is still open, and according to a recent speech by the SEC’s chief accountant, is not expected before mid-year 2012 (CFO-Magazine (2012)). Potential ways of integrating IFRS with the U.S. institutional environment could include ongoing convergence of IFRS and U.S. GAAP, the piecemeal embedding of IFRS into the body of U.S. GAAP, or an approach commonly referred to as “condorsement”, i.e. a mixture of the two.

According to the SEC’s 2010 Work Plan, if IFRS were to be fully adopted, U.S. issuers would start switching to IFRS approximately in 2015 or 2016. This possibility emphasizes the need for empirical evidence on the potential effects on financial reporting properties of a transition from U.S. GAAP to IFRS. The consequences resulting from differences between the two sets of standards can have implications for the convergence efforts of the FASB and the IASB, but also for the decision of the SEC about required

³ 20-F reconciliations were required from foreign private issuers listed on a U.S. stock exchange. These firms had to reconcile their IFRS profit and book value of equity to net income and book value of equity prepared under U.S. GAAP. From the beginning of 2008 onwards, these reconciliations were no longer required from firms preparing their financial statements under IFRS (SEC, 2007).

adoption of IFRS in the U.S., as well as for firms affected by mandatory transition to IFRS, or given an option to adopt IFRS voluntarily.

2.2.3. Related literature

This study builds on two streams of literature: First, we add to a large body of research on the economic consequences of international differences in accounting standards. Assessing the impact of accounting standards, given cross-country variation in institutions, requires settings in which one of these factors is held constant while the other varies. Researchers have attempted this by exploiting (1) reconciliations of income and equity from domestic GAAP to U.S. GAAP provided to the SEC by foreign issuers on form 20-F; (2) transitions from domestic GAAP to IFRS; and (3) cross-sectional comparisons of groups of firms concurrently applying different sets of accounting standards within the same institutional environment. All of these studies face similar research design issues that our setting allows us to mitigate.

Prior to 2007, foreign IFRS firms had to reconcile their net income and equity to U.S. GAAP on form 20-F. Several studies use these 20-F reconciliations to assess the economic consequences of differences between U.S. GAAP and IFRS. Using 31 firms from a period before the commencement of convergence efforts (1992-1996), Harris and Muller (1999) find inconclusive results regarding differential associations of market-based metrics and IFRS- versus U.S. GAAP-based accounting amounts (Harris and Muller (1999)). More recently, Henry et al. (2009) evaluate the impact of convergence on differences between U.S. GAAP and IFRS amounts for 75 cross-listed EU firms between 2004 and 2006, finding that reconciliations between IFRS and U.S. GAAP are value relevant (Henry et al. (2009)). Our paper differs from

these studies in that it is the first to use actual transitions from U.S. GAAP to IFRS. Doing so has two main advantages: First, actually transitioning to a new set of standards likely implies different implementation choices compared to merely reconciling a limited set of key figures for compliance purposes. Soderstrom and Sun (2007) argue that reconciliations may be implemented to maximize consistency with U.S. GAAP. Second, reconciliation studies commonly combine firms from several countries, where our German setting allows us to hold institutional factors constant.

Since the European Union (EU) was the first major economy to mandate IFRS, and because several EU states previously allowed firms to use IFRS voluntarily, the IFRS adoption literature comprises earlier papers analyzing voluntary IFRS adoption (reviewed by Soderstrom and Sun (2007); e.g. Barth et al. (2008)) as well as more recent studies assessing the economic consequences of mandatory IFRS adoption (reviewed by Brüggemann et al. (2012)). All of these papers focus on transitions from domestic GAAP regimes to IFRS. Especially the latter, more developed set finds inconclusive effects on financial reporting properties such as comparability (e.g., Cascino and Gassen (2010); Lang et al. (2010)), value relevance (e.g. Aharony et al. (2010); Barth et al. (2011)), and accounting ‘quality’ (e.g. Ahmed et al. (2012); Atwood et al. (2011)), whereas much of the evidence seems to be consistent with positive capital-market (e.g. Daske et al. (2008); Li (2009); DeFond et al. (2011)) and macroeconomic consequences (e.g. Amiram (2009); Beneish et al. (2012); Chen et al. (2011); Márquez-Ramos (2008)). Although this literature is vast and rapidly growing, our study is innovative in two respects: First, it is the first to analyze transitions *from U.S. GAAP* to IFRS, which puts us in the unique position to contribute to the current policy debate in the U.S.. Second, we are

aware of no other study that investigates the effect of IFRS adoption, voluntary or mandatory, on earnings informativeness.

Another related line of literature also exploits the German setting, but in a way that differs from ours, namely by comparing financial reporting outcomes across U.S. GAAP and IFRS firms. Bartov et al. (2005) find that earnings based on IFRS or U.S. GAAP are more value relevant than earnings prepared under German GAAP. However, they do not find significant differences in value relevance between earnings prepared under U.S. GAAP and IFRS (Bartov et al. (2005)). Van der Meulen et al. (2007) find significantly higher predictability for U.S. GAAP data compared to IFRS data (Van der Meulen et al. (2007)). Also, Leuz (2003) fails to find significant differences in information asymmetry (measured using bid-ask spread and share turnover) across U.S. GAAP and IFRS firms. We add to this literature by being the first study to use a setting in which U.S. GAAP and IFRS reporting is observed for the *same set of firms*, allowing each firm to act as its own control.

Second, we build on prior research on earnings response coefficients (ERCs) and earnings informativeness. Our use of ERCs as a measure of earnings informativeness is based on a model developed by Holthausen and Verrecchia (1988) and Kothari (2001). This model has been used in several recent studies analyzing factors that influence the informativeness of earnings, including ownership structure (e.g. Francis et al. 2005) and book-tax conformity (Hanlon et al., 2008). We add to this body of research by analyzing how a wholesale accounting regime shift, i.e. a switch from U.S. GAAP to IFRS, affects earnings informativeness, i.e. the ability of earnings to capture or summarize information.

2.2.4. Hypothesis development

Earnings represent an information release that captures or summarizes information, regardless of source, with a potential to affect share values (Francis and Schipper (1999)). Following prior research (Beaver et al. (1980); Hanlon et al. (2008); Holthausen and Verrecchia (1988); Kothari (2001)) and based on the model developed by (Teoh and Wong (1993)), we expect the slope coefficient in a regression of returns on earnings, i.e. the earnings response coefficient (ERC), to decrease in the noise content of earnings. Expressed differently, the more accurately earnings reflect ‘true’ economic performance, the larger is the magnitude of the ERC, *ceteris paribus*.

We test if the noise component in earnings changes upon a transition from U.S. GAAP to IFRS. The analytical model of Teoh and Wong (1993) relates greater prior uncertainty about firm value to a larger magnitude of the ERC, as greater uncertainty increases the information value of the earnings signal. As we are only interested in the effect of the noise component in earnings, we control for prior investor uncertainty (see section 3.1 for details). Thus, a change in the ERC upon a switch from U.S. GAAP to IFRS would indicate a change in the information captured by earnings.

Investors revise their expectations about future earnings in response to earnings innovations. The impact of earnings innovations on forecasted earnings revisions depends on the persistence of earnings which consequently affects the ERC (Easton and Zmijewski (1989); Kormendi and Lipe (1987); Kothari (2001); Lipe (1990)). If earnings are fully transitory, the ERC is less or equal to 1 as forecasted earnings are not revised and consequently security prices are not very sensitive. Security prices are more sensitive to changes in persistent components of earnings because the stock return response to an

earnings release also incorporates the change in net present value of the revised forecasted earnings. Thus the ERC increases in earnings persistence (Easton and Zmijewski (1989); Kormendi and Lipe (1987); Kothari (2001); Lipe (1990)). If investors revise forecasted earnings based on changes in persistent components of current earnings, the ERC will be 1 plus a component that reflects the net present value of investors' future earnings revisions. Control for changes in earnings persistence leaves our results qualitatively unchanged (see section 5.3 for details). A third possibility is earnings innovations that are price irrelevant. Stock returns are completely insensitive to these noise components.

Consistent with prior literature we use stock returns as a proxy for economic earnings unaffected by noise (Kothari (2001); Hanlon et al. (2008)). Earnings prepared under different sets of accounting standards might capture or summarize information that affects share values to a different extent and contain different magnitudes of noise. Discretion inherent in accounting standards can be used for earnings management that either provides stakeholders with private information (Dechow and Dichev (2002)) or that is used opportunistically and thus introduces noise (Marquardt and Wiedman (2004)). The consequence is an increase or decrease in earnings informativeness (Hanlon et al. (2008)).

It is not entirely clear how IFRS and U.S. GAAP differ along these dimensions. IFRS are generally viewed as being more principles-based than U.S. GAAP (e.g. Benston et al. (2006)). Both sets of standards contain different possibilities to manage earnings for which conjectures about effects on earnings informativeness are contradictory. First, principles-based standards are viewed as being more difficult to circumvent than standards that are more rules-based (Barth (2008)). If standards are very detailed and contain 'bright

line' rules, managers can structure transactions to meet specific goals (Nelson et al. (2002); Barth (2008)). Principles-based standards may help alleviate this problem. Second, contrary to this view is the perspective that principles-based accounting standards contain less-detailed rules and provide greater flexibility to managers and thus lead to increased opportunities for earnings management (Barth (2008); Ewert and Wagenhofer (2005)). The noise component in earnings increases if managers manage earnings opportunistically. If these earnings were not managed, they would better reflect a company's real economic position and performance and be more credible to investors. Given this discussion, the extent to which IFRS and U.S. GAAP differ in terms of the noise content in earnings is an empirical question addressed in this paper.

In addition to different opportunities for earnings management across IFRS and U.S. GAAP, several differences exist that might affect earnings informativeness. For example, U.S. GAAP require the expenditure of all research and development costs but development costs must be recognized under IFRS conditional on specific criteria being met.

If the accounting treatment of an economic transaction differs between two sets of standards, earnings consequently convey credible information to investors to a different extent. While under one set of accounting standards the economic value of the transaction will be reflected in earnings, a different accounting treatment might garble its "true" effect on earnings (Kothari (2001)) and consequently add noise to the earnings component.

As many differences and different earnings management opportunities between standards exist that introduce a noise component into earnings, we expect a switch between U.S. GAAP and IFRS to significantly influence

earnings informativeness; however, we are unable to make a sign prediction. Therefore, we state the following hypothesis:

H₁ Earnings informativeness changes when firms switch from U.S. GAAP to IFRS.

Firms in Germany had the choice between U.S. GAAP and IFRS before 2005 and presumably based their decision on a cost-benefit tradeoff. Hence, we suggest that firms choosing U.S. GAAP (our ‘treatment group’) have an interest in reporting IFRS data that is closely comparable to the previously reported U.S. GAAP data. We find anecdotal evidence that firms use discretion to “maintain to the greatest possible extent the accounting practices previously applied under U.S. GAAP”⁴. However, due to data restrictions we are unable to identify the effects of the discretion used in the IFRS adoption process. As firms have to prepare reconciliations from U.S. GAAP to IFRS equity and income amounts in the transition period, we can observe *de facto* differences between incomes prepared under U.S. GAAP and IFRS. Accounting data of firms with smaller *de facto* differences between U.S. GAAP and IFRS income might be biased because firms exercise discretion to report IFRS data that is comparable to U.S. GAAP data to the greatest possible extent. If a change from U.S. GAAP to IFRS has an effect on earnings informativeness it will hence be more pronounced for firms with larger *de facto* differences between annual reports prepared under U.S. GAAP and IFRS.

In addition, the impact of an accounting standard change on equity and income differs across firms. It is dependent on the individual business transactions of firms and differences in the accounting for these transactions under U.S. GAAP and IFRS. The effect on earnings informativeness for firms

⁴ Continental AG, Annual Report 2005.

with smaller *de facto* income differences might be marginal. Studying the effect of mandatory IFRS adoption on financial statement comparability in the UK, Brochet et al. (2011) partition their sample based on the magnitude of relative reconciliation amounts in order to identify the firms *least* impacted by changes in information quality upon IFRS. We are interested in changes in “information quality” upon transition from U.S. GAAP to IFRS, and thus in firms with the *largest de facto* differences between U.S. GAAP and IFRS net incomes.⁵

H₂ Changes in earnings informativeness upon transition from U.S. GAAP to IFRS are more pronounced for firms with larger de facto reconciliation differences between IFRS and U.S. GAAP net incomes.

2.3. Research design and sample

2.3.1. Measuring earnings informativeness

We examine changes in earnings informativeness for firms transitioning from U.S. GAAP to IFRS by investigating the slope coefficients from a regression of returns on annual earnings (the earnings response coefficient; ERC). We interpret differences in ERCs across U.S. GAAP and IFRS firm-year observations as evidence that earnings informativeness differs across the two financial reporting regimes. Consistent with prior research (e.g. Francis et al. (2005)), we estimate the following basic regression model:

$$RET_{i,t} = \beta_0 + \beta_1 E_{i,t} + \sum_{k=1}^4 \gamma_k X_{i,t-1}^k + \sum_{k=1}^4 \alpha_k E_{i,t} \times X_{i,t-1}^k + \varepsilon_{i,t} \quad (1)$$

⁵ U.S. GAAP-to-IFRS reconciliations also include reconciliation differences between U.S. GAAP and IFRS shareholders’ equity amounts. However, as we investigate earnings informativeness (i.e., an earnings property) *de facto* reconciliation differences between U.S. GAAP and IFRS net income amounts will best reflect the effect of the accounting standard change on future earnings. In addition, IFRS 1 contains several options that induce one-time effects on equity upon first-time IFRS adoption. An example is the fresh-start method for actuarial gains and losses relating to post-employment benefits, which permits recognition of all actuarial gains and losses directly in equity upon transition to IFRS. Book value of equity is thus distorted by one-time transition effects, and reconciliation differences between U.S. GAAP and IFRS book values of equity might not be representative of an effect of differences between the two sets of accounting standards on equity.

where:

$RET_{i,t}$ is the 12-month stock return of firm i , measured in the period beginning 3 months after year end of fiscal period $t-1$ and ending 3 months after year end of fiscal period t (derived from the Datastream variable RI);

$E_{i,t}$ is earnings per share (10010), reflecting profit after tax and minority interest of firm i in period t , scaled by stock price (05001) at the end of period $t-1$.

X is a vector of control variables that includes the following controls:

BTM is the book-to-market ratio of firm i at end of fiscal period $t-1$, calculated as equity (03501) over market capitalization (08001);

$SIZE$ is the natural logarithm of market capitalization (08001) of firm i at end of fiscal period $t-1$;

LEV is total long term debt (03251) of firm i at end of fiscal period $t-1$ over total assets (02999) of firm i at end of fiscal period $t-1$;

$LOSS$ is an indicator variable equal to 1 if $E_{i,t}$ is negative; and 0 otherwise (implying a positive $E_{i,t}$).

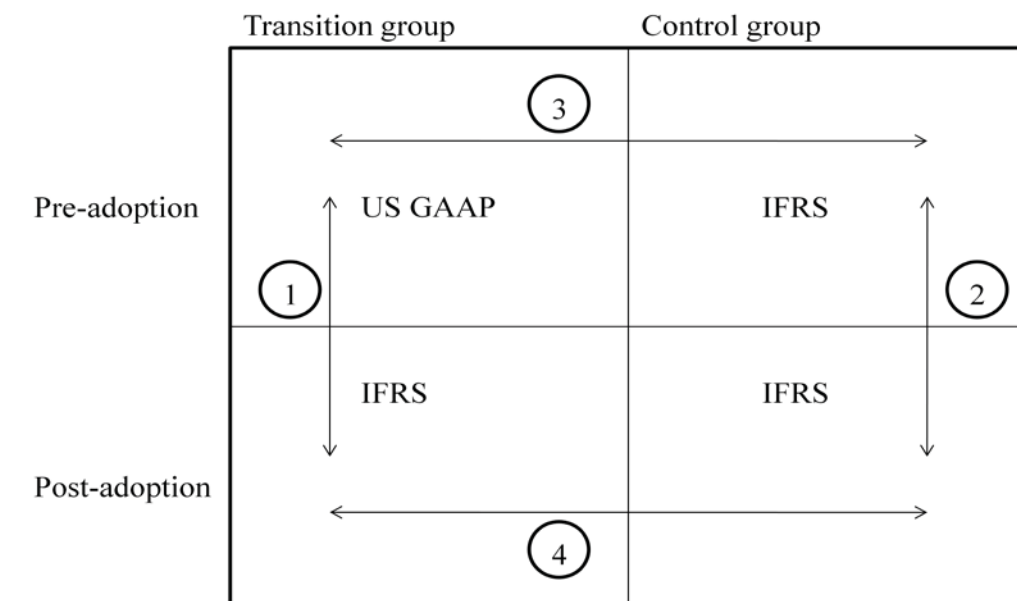
Following the model of Teoh and Wong (1993), the ERC is driven by prior uncertainty about the market value of a firm and the noise component in the earnings signal. As we are interested in the noise component in earnings, we include a vector of control variables, X , that contains variables related to investor uncertainty about earnings to isolate the effect of noise on the ERC. We use BTM , the book to market ratio, to control for growth opportunities. Collins and Kothari (1989) find that growth opportunities have a positive effect on the ERC: As future earnings will be larger if a firm has growth opportunities, a surprise in current earnings might be an indicator and informative of such growth opportunities (Collins and Kothari (1989)). Next, we include LEV . Dhaliwal et al. (1991) identify default risk as having a negative effect on the ERC. Default risk increases uncertainty of investors

about future earnings. As default risk cannot be directly observed, the long term debt over total assets ratio serves as a proxy (Dhaliwal et al. (1991)). Hence, we expect an increase in leverage to be negatively associated with the ERC. *SIZE*, the logarithm of market capitalization serves as a proxy for firm size. Freeman (1987) finds that firm size is negatively related to the magnitude of abnormal returns related to earnings announcements. Precise earnings forecasts can be derived earlier for larger firms and larger firms' market value is based on non-earnings information to a larger extent than a smaller firms' market value. Smaller firms' market value is more dependent on historical time series of unadjusted accounting earnings (Freeman (1987)). We thus expect a negative association between the magnitude of the ERC firm size. Additionally, we use *LOSS*, an indicator variable that is 1 if earnings are negative, and 0 otherwise, to control for negative earnings. As suggested by prior literature, losses are perceived as temporary and investors have the option to liquidate their investment rather than suffer permanent losses (Hayn (1995)). Hence the association between losses and returns will be lower than that between profits and returns, and the magnitude of the ERC will be smaller.

2.3.2. Difference-in-differences analysis

The German setting allows us to conduct a difference-in-differences analysis (Meyer (1995)). Figure 1 shows that we distinguish two groups of firms: First, the 'transition group' consisting of firms that switch from U.S. GAAP to IFRS. Second, the 'control group' consisting of matched firms preparing their financial statements according to IFRS in all periods under analysis.

Figure 1: Difference-in-differences design



This figure illustrates the difference-in-differences research design applied in this study. Two subsamples are presented in the figure, one transition group and one control group. The subsamples are analyzed over a pre-IFRS adoption period and a post-IFRS adoption period. We investigate the change in earnings informativeness of companies that change their accounting system from U.S. GAAP to IFRS which is the longitudinal change (arrow 1). Additionally, the longitudinal change in earnings informativeness of the control group is analyzed (arrow 2) to control for changes in earnings informativeness attributable to other factors than a change in accounting standards. Earnings informativeness of the two subsamples can also be compared directly to each other in pre- and post-IFRS adoption periods. This is the cross-sectional change which is illustrated by arrow 3 and arrow 4. The test of our main hypothesis consists of comparing the magnitude of the effects illustrated by arrows 1 and 2.

As illustrated in Figure 2, transition group firms are analyzed over four periods: two pre- and two post-adoption years. Control group firms, in contrast, do not change their accounting system over the analysis period, but prepare their financial statements according to IFRS in all periods. These firms are analyzed over the same time period as their matched transition group counterparts. Therefore, we require that control firms have adopted IFRS at least two years before their respective transition group counterparts switch from U.S. GAAP to IFRS.

We adapt our basic regression presented in equation (1) to implement our difference-in-differences research design (e.g. Hanlon et al. (2008)). We extend the regression by two indicator variables and related interaction terms. The indicator variables are interacted with levels of earnings as shown in the following augmented regression model:

$$\begin{aligned}
RET_{i,t} = & \beta_0 + \beta_1 US_{i,t} + \beta_2 POST_{i,t} + \beta_3 E_{i,t} + \beta_4 US_{i,t} \times E_{i,t} + \beta_5 POST_{i,t} \times E_{i,t} \\
& + \beta_6 US_{i,t} \times POST_{i,t} + \beta_7 US_{i,t} \times POST_{i,t} \times E_{i,t} + \sum_{k=1}^4 \gamma_k X_{i,t-1}^k \\
& + \sum_{k=1}^4 \alpha_k E_{i,t} \times X_{i,t-1}^k + \varepsilon_{i,t}
\end{aligned} \tag{2}$$

where:

POST is 1 for observations from periods after transition to IFRS and 0 for observations from periods before transition to IFRS;

US is 1 for observations that belong to a firm in the transition group and 0 for observations that belong to firms in the control group.

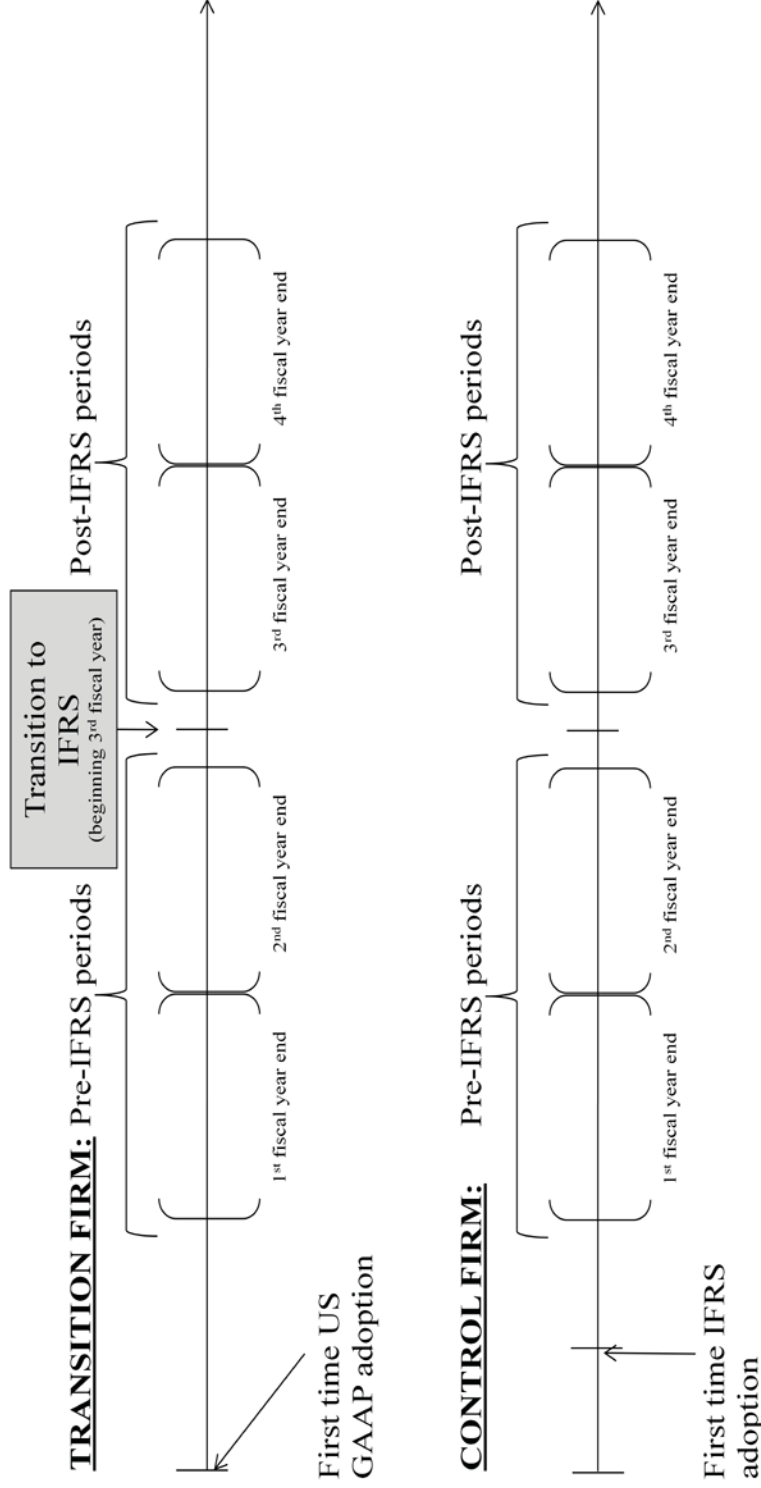
Our augmented regression model comprises interaction terms that capture differences in ERCs induced by the change in the accounting standard system and other factors than a change in the accounting system, respectively. Coefficient β_3 is the ERC of matched control firms following IFRS in pre-IFRS adoption periods of their matched counterparts which follow U.S. GAAP. With the interaction of *E* and our *US* indicator variable we are able to determine the incremental effect on earnings informativeness of a firm following U.S. GAAP relative to a firm following IFRS. Coefficient β_4 represents this incremental effect.

With the interaction of *E* and our second indicator variable denoted as *POST* we determine the change in ERC between pre- and post-IFRS adoption periods attributable to other factors than a change in accounting system.

Coefficient β_5 represents this change in ERC of the control firms between pre- and post-IFRS adoption periods.

Finally, we interact both indicator variables, *US* and *POST*, with levels of earnings. Coefficient β_7 represents the incremental ERC for a firm out of the transition group relative to all other ERCs, and is used to test H_1 . The other ERCs are the ERCs of the control group in pre- and post-IFRS adoption periods and the ERC of the transition group before IFRS adoption.

Figure 2: Pre-IFRS and Post-IFRS measurement periods



The figure illustrates the measurement periods in which the earnings informativeness test is conducted. We analyze each firm out of the transition group over four periods, two pre-IFRS adoption periods and two post-IFRS adoption periods. A matched control firm that constantly follows IFRS is analyzed over the same time period as the transition firm. With the pre- and post-IFRS adoption periods of the control firm we mean the pre- and post-IFRS adoption periods of its matched counterpart (the transition firm). For the control firm it is important that the time point of first time IFRS adoption is before the first period analyzed.

2.3.3. Reconciliation differences

In our subsample tests, we exploit reconciliation differences between U.S. GAAP and IFRS net income figures that we hand-collect from transition firms' first sets of IFRS financial statements. IFRS 1 regulates the first-time adoption of IFRS, requiring retrospective application of all IFRS upon first-time IFRS adoption (i.e. as if IFRS had always been applied), with some exceptions. IFRS 1 excludes several standards from retrospective application, and permits optional retrospective application for others to ease the transition to IFRS. Differences between previously used GAAP and IFRS are recognized directly in equity. Transitioning firms have to provide reconciliations of book value of equity and comprehensive income prepared under previous GAAP to equity and comprehensive income prepared under IFRS in their first set of IFRS financial statements.

Following prior research, we express differences between U.S. GAAP and IFRS net incomes in terms of a comparability index (Adams et al. (1999); Gray (1980); Henry et al. (2009); Street et al. (2000)), as follows:

$$\text{comparability index} = 1 - \left(\frac{NI_{US} - NI_{IFRS}}{|NI_{US}|} \right),$$

where NI_{US} is net income prepared under U.S. GAAP, and NI_{IFRS} is net income prepared under IFRS. By subtracting IFRS net income from U.S. GAAP net income and scaling the difference by the absolute amount of U.S. GAAP net income, we derive an income difference relative to absolute U.S. GAAP income, which is then subtracted from 1. If IFRS net income is smaller (larger) than U.S. GAAP net income, the comparability index is smaller (larger) than 1. The comparability index is equal to 1 if IFRS net income is equal to U.S. GAAP net income. The more the comparability index deviates

from 1, the larger is the difference between U.S. GAAP and IFRS net income figures.

In addition to the relative overall net income differences, we analyze 14 reconciling items, each reflecting a particular accounting issue that causes IFRS and U.S. GAAP net incomes to differ for a particular firm (e.g., intangible assets, financial instruments or employee benefits). We then apply the comparability index logic to each reconciling item:⁶

$$\text{reconciling item}_i \text{ comparability index} = 1 - \left(\frac{\text{Reconciling item}_i}{|NI_{US}|} \right)$$

2.3.4. Sample

As presented in Table 2, the transition group that switches from U.S. GAAP to IFRS comprises a maximum of 108 firms. For every transition group firm, we determine an appropriate control firm out of the 646 German firms covered by Datastream that constantly follows IFRS. Matching takes place based on size (market capitalization)⁷. We use the control group to control for changes in earnings informativeness induced by factors other than a change in the accounting regime.

It is important, that the annual fiscal year of each transition firm ends at the same date as the annual fiscal year of its matched counterpart. Otherwise there might be a distortion in the control for changes in the institutional environment. Hence, we drop all transitioning firms with an annual fiscal year

⁶ The individual reconciling item comparability indices are interpreted in a way analogous to the aggregate reconciling item comparability index described previously, i.e. values larger (smaller) than 1 reflect reconciling items that decrease (increase) IFRS net income relative to U.S. GAAP net income.

⁷ Matching firms that transition from U.S. GAAP to IFRS to firms that constantly follow IFRS based on industry and size decreases our sample size, as for some early transitioners no appropriate matches can be identified. However, when matching on industry and size our results are qualitatively the same.

end different from December 31, reducing the sample size to 89 firms for the transition and control groups, respectively. All firms are analyzed over four periods (Figure 2): two pre-IFRS adoption periods and two post-IFRS adoption periods. Over all periods, both groups combine to form a sample of a maximum of 712 firm-year observations.

Table 2: Sample composition

Transition group		Control group	
German firms transitioning from U.S. GAAP to IFRS	108	Matched firms following IFRS	108
Transitioning firms with a fiscal year end different than December 31 st	-19	Deletion of matches of excluded transitioning firms	-19
Transition firms included in analysis (full sample)	89	Control firms included in analysis (full sample)	89
Analyzed over 2 pre- and 2 post-adoption periods	x4	Analyzed over 2 pre- and 2 post-adoption periods	x4
Firm year observations transition group	356	Firm year observations control group	356
Firm year observations excluded due to insufficient data and truncating of variables	-129	Firm year observations excluded due to insufficient data and truncating of variables	-119
Firm year observations transition group	227	Firm year observations control group	237
Transition firms included in subsample analysis (89 * 1/3)	30	Control firms included in subsample analysis (89 * 1/3)	30
Analyzed over 2 pre- and 2 post-adoption periods	x4	Analyzed over 2 pre- and 2 post-adoption periods	x4
Firm year observations transition group	120	Firm year observations control group	120
Firm year observations excluded due to insufficient data and truncating of variables	-39	Firm year observations excluded due to insufficient data and truncating of variables	-48
Firm year observations transition group	81	Firm year observations control group	72

The table shows the composition of the analyzed sample. We subtract 19 firms from the 108 German firms transitioning from U.S. GAAP to IFRS as their fiscal year end is different than December 31st. Consequently we also deduct their matched counterparts included in the control group. We analyze the remaining 89 firms over 4 periods, resulting to a maximum of 356 observations for the transition group and the control group, respectively. For the subsample analysis we analyze one-third of all sample firms.

2.4. Empirical results

2.4.1. Full-sample tests (H1)

For the transition firms informativeness of earnings from two pre- and two post-IFRS adoption periods is compared. Additionally, the change between these periods is assessed for a control group of firms that follow IFRS in all analyzed periods. The difference in the longitudinal earnings informativeness differences of the transition group and the control group (the “diff-in-diff”) is the change in earnings informativeness that is attributable to the switch from U.S. GAAP to IFRS itself, rather than to changes in other factors that affect earnings informativeness.

2.4.1.1. Descriptive statistics

Table 3 presents descriptive statistics for our two subsamples separated into pre- and post-IFRS adoption periods (see Figure 2). We truncate all variables at the upper and lower two percent levels⁸. For the subsamples we distinguish between observations of firms using either IFRS or U.S. GAAP and between pre-IFRS and post-IFRS adoption periods. We observe that scaled earnings tend to be larger in post-IFRS adoption periods (transition group: mean = 0.01, median = 0.05; control group: mean = 0.01, median = 0.05) than in pre-IFRS adoption periods (transition group: mean = -0.04, median = 0.02; control group: mean = -0.05, median = 0.03). Across subsamples earnings in pre- and post-IFRS adoption periods are very similar for control firms (pre-IFRS: mean = -0.05, median = 0.03; post-IFRS: mean = 0.01, median = 0.05) and firms transitioning from U.S. GAAP to IFRS (pre-IFRS: mean = -0.04,

⁸ We truncate and also winsorize our variables at different levels between one and five percent. Our results are robust to different outlier treatments.

median = 0.02; post-IFRS: mean = 0.01, median = 0.05). Returns decrease in post-IFRS adoption periods for both subsamples, for the control group (pre-IFRS: mean = 0.34, median = 0.13; post-IFRS: mean = 0.23, median = 0.17) and the transition group (pre-IFRS: mean = 0.43, median = 0.34; post-IFRS: mean = 0.19, median = 0.11).

Table 3: Descriptive statistics – full sample analysis

Transition group – pre-IFRS adoption		Control group – pre-IFRS adoption														
	n	Mean	S.D.	Min	0.25	Mdn	0.75	Max	n	Mean	S.D.	Min	0.25	Mdn	0.75	Max
<i>E</i>	114	-0.04	0.21	-0.86	-0.09	0.02	0.09	0.19	116	-0.05	0.24	-1.23	-0.12	0.03	0.08	0.25
change <i>E</i>	114	0.11	0.40	-0.37	-0.04	0.02	0.10	2.43	116	0.07	0.39	-0.98	-0.04	0.02	0.09	2.54
<i>RET</i>	114	0.43	0.75	-0.67	-0.13	0.34	0.89	2.72	116	0.34	0.69	-0.72	-0.12	0.13	0.58	2.93
<i>BTM</i>	114	0.87	0.49	0.11	0.50	0.77	1.16	2.42	116	0.94	0.67	0.09	0.43	0.78	1.26	3.08
<i>SIZE</i>	114	11.82	2.01	8.79	10.25	11.44	12.69	17.61	116	11.83	2.08	8.98	10.29	11.29	12.94	17.89
<i>LEV</i>	114	0.10	0.11	0.00	0.02	0.06	0.15	0.50	116	0.12	0.11	0.00	0.02	0.09	0.20	0.45
<i>LOSS</i>	114	0.43	0.50	0	0	0	1	1	116	0.34	0.48	0	0	0	1	1
Transition group – post-IFRS adoption		Control group – post-IFRS adoption														
	n	Mean	S.D.	Min	0.25	Mdn	0.75	Max	n	Mean	S.D.	Min	0.25	Mdn	0.75	Max
<i>E</i>	113	0.01	0.13	-0.55	-0.02	0.05	0.08	0.19	121	0.01	0.17	-1.13	0.00	0.05	0.09	0.25
change <i>E</i>	97	0.05	0.20	-0.27	-0.03	0.01	0.08	1.23	121	0.09	0.30	-0.72	0.00	0.03	0.11	1.89
<i>RET</i>	113	0.19	0.43	-0.54	-0.10	0.11	0.40	1.92	121	0.23	0.51	-0.63	-0.08	0.17	0.50	2.07
<i>BTM</i>	113	0.64	0.31	0.09	0.40	0.60	0.82	1.99	121	0.68	0.48	-0.16	0.37	0.51	0.84	2.53
<i>SIZE</i>	113	11.98	1.87	9.15	10.53	11.52	13.06	17.69	121	11.88	1.83	9.22	10.5	11.38	13.02	17.81
<i>LEV</i>	113	0.09	0.09	0.00	0.03	0.07	0.14	0.43	121	0.13	0.12	0.00	0.03	0.10	0.20	0.46
<i>LOSS</i>	113	0.27	0.45	0	0	0	1	1	121	0.25	0.43	0	0	0	0	1

The four tables present descriptive statistics for all variables used in the full sample earnings informativeness test. We separate the data into four subgroups. The tables present the data for the firms that transition from U.S. GAAP to IFRS in pre-IFRS and post-IFRS adoption periods, separately. Additionally, data for the control group is presented. The data of the control group is also separated into pre-IFRS and post-IFRS adoption periods, although these firms constantly follow IFRS. The data of a firm that belongs to the control group is assigned to pre-IFRS adoption period observations if its matched counterpart out of the transition group is still using U.S. GAAP in this particular period.

All data is obtained from the Datastream database. *E* are earnings of period t (10010) scaled by stock prices (05001) at the end of period $t-1$. Change *E* are changes in earnings of period t (10010) scaled by stock prices (05001) at the end of period $t-1$. *RET* is the 12-month stock return measured in the period beginning 3 month after year end of fiscal period $t-1$ and ending 3 month after year end of fiscal period t (derived from the Datastream variable RI). *BTM* is the book to market ratio, calculated with equity (03501) over market capitalization (08001). *SIZE* is the natural logarithm of market capitalization (08001).

LEV is calculated as total long term debt (03251) over total assets (02999). LOSS is an indicator variable that is 1 if earnings are negative and 0 otherwise. All variables are truncated on the upper and lower two percent level. Due to limited data availability the numbers of observations vary slightly between variables and subsamples.

2.4.1.2. Multivariate test – earnings informativeness

Panel A of Table 4 presents the results of our regression of returns on earnings. With respect to the control variables, consistent with Hayn (1995) the coefficient on the interaction of earnings and the LOSS dummy variable is significantly negative, suggesting an expected negative incremental effect of losses on the ERC. Turning to the experimental variables, β_3 shows that the ERC of the control firms in pre-IFRS adoption periods is significantly positive (coefficient = 6.50, z-statistic = 3.94). The incremental ERC of firms following U.S. GAAP before transition to IFRS, β_4 , is not significant (coefficient = -0.52, z-statistic = -0.97). This finding indicates that firms following U.S. GAAP do not have a different ERC from firms following IFRS. Coefficient β_5 (coefficient = -0.52, z-statistic = -1.25) captures a change in ERC for the control firms between the pre- and post-IFRS adoption periods of their treatment group counterparts. The coefficient is insignificant, indicating that ERCs of the control firms between pre- and post-IFRS adoption did not change. Of special interest, β_7 , which captures the difference-in-differences in ERCs of transition group versus control firms between pre- and post-IFRS adoption periods is insignificant (coefficient = 0.17, z-statistic = 0.24).

Panel B of Table 4 reports the group coefficients of the transition group and the control group in the pre- and post-IFRS adoption periods. The group coefficients are derived as linear combinations of the estimators of the regression model. The coefficients are all positive and significant. We observe a slightly smaller group coefficient for the transition firms after transition to IFRS (coefficient = 5.64, z-statistic = 3.60) than the coefficient of the transition group before transition to IFRS (coefficient = 5.99, z-statistic = 4.02). We also find a decrease of group coefficients for the firms out of the control group

between pre- and post-IFRS adoption periods of their matched counterparts. The coefficient decreases in post-IFRS adoption periods (coefficient = 5.99, z-statistic = 3.92) and is smaller than the coefficient in pre-IFRS adoption periods, which is reflected by β_3 (coefficient = 6.50, z-statistic = 3.94). However, as presented in Panel C, all pre- and post-IFRS adoption differences and differences in ERCs between the transition group and control group are insignificant.

We thus do not observe significant cross-sectional differences between ERCs of firms using U.S. GAAP and firms using IFRS. Especially, the difference-in-differences in ERCs of the transition group and the control group between pre- and post-IFRS adoption periods, β_7 , is insignificant. For our full sample tests, we thus reject H_1 , which expects that earnings informativeness changes when firms switch from U.S. GAAP to IFRS.

Table 4: Multivariate earnings informativeness results – full sample analysis

$$RET_{i,t} = \beta_0 + \beta_1 US_{i,t} + \beta_2 POST_{i,t} + \beta_3 E_{i,t} + \beta_4 US_{i,t} \times E_{i,t} + \beta_5 POST_{i,t} \times E_{i,t} + \beta_6 US_{i,t} \times POST_{i,t} + \beta_7 US_{i,t} \times POST_{i,t} \times E_{i,t} + \sum_{k=1}^4 \gamma_k X_{i,t-1}^k + \sum_{k=1}^4 \alpha_k E_{i,t} \times X_{i,t-1}^k + \varepsilon_{i,t}$$

Panel A							
R-squared	0.21			Number of observations		464	
Variable	Coefficient	Expected Sign	Coefficient	Standard Error	z	P> z	
<i>US</i>	β_1		0.11	0.09	1.30	0.19	
<i>POST</i>	β_2		-0.05	0.06	-0.78	0.44	
<i>E</i>	β_3	+	6.50 ***	1.65	3.94	0.00	
<i>US * E</i>	β_4	+/-	-0.52	0.54	-0.97	0.33	
<i>POST * E</i>	β_5	+/-	-0.52	0.41	-1.25	0.21	
<i>US * POST</i>	β_6	+/-	-0.11	0.09	-1.13	0.26	
<i>US * POST * E</i>	β_7	+/-	0.17	0.69	0.24	0.81	
<i>BTM</i>			0.39 ***	0.08	5.03	0.00	
<i>SIZE</i>			-0.03 *	0.01	-1.83	0.07	
<i>LEV</i>			0.33	0.29	1.14	0.25	
<i>LOSS</i>			0.11	0.09	1.12	0.26	
<i>BTM * E</i>		+	-0.50 **	0.23	-2.13	0.03	
<i>SIZE * E</i>		-	-0.10	0.09	-1.04	0.30	
<i>LEV * E</i>		-	0.09	1.48	0.06	0.95	
<i>LOSS * E</i>		-	-4.27 ***	0.96	-4.43	0.00	
Constant			0.02	0.22	0.08	0.94	

Panel B						
Group Coefficients						
	Coefficient	Derivation	z	P> z		
A: Firm years control group pre-IFRS	6.50 ***	β_3	3.94	0.00		
B: Firm years control group post-IFRS	5.99 ***	$\beta_3 + \beta_5$	3.92	0.00		
C: Firm years transition group pre-IFRS	5.99 ***	$\beta_3 + \beta_4$	4.02	0.00		
D: Firm years transition group post-IFRS	5.64 ***	$\beta_3 + \beta_4 + \beta_5 + \beta_7$	3.60	0.00		

Panel C					
Differences Group Coefficients					
	Coefficient	Derivation	z	P> z	
I. Diff transition group pre/post	-0.35	D - C	-0.64	0.53	
II. Diff control group pre/post	-0.52	B - A	-1.25	0.21	
III. Diff pre-adoption transition/control group	-0.52	C - A	-0.97	0.33	
IV. Diff post-adoption transition/control group	-0.35	D - B	-0.74	0.46	

Panel D					
Difference-in-Differences					
	Coefficient	Derivation	z	P> z	
Difference in pre/post adoption differences	0.17	I. - II. (β_7)	0.24	0.81	

In panel A the table presents a regression of 12 months returns on earnings of a group of firms that switch from U.S. GAAP to IFRS and a group of firms that constantly follow IFRS. The second group is a control group consisting of firms that are matched counterparts of the transitioning firms. We estimate a panel regression with robust standard errors.

In panel B the table presents the group coefficients that are derived from linear combinations of the estimators from the regression model. We report four group coefficients; First, the coefficient for firms out of the control group for periods before their matched counterparts transition to IFRS (A). Second, the coefficient for firms out of the control group for periods after their matched counterparts transitioned to IFRS (B). Third, the coefficient of firms that transition from U.S. GAAP to IFRS in pre-IFRS adoption periods (C). And fourth, the coefficient of firms that transition from U.S. GAAP to IFRS in post-IFRS adoption periods (D).

Panel C presents the differences between group coefficients. For each group the longitudinal change between pre- and post-IFRS adoption periods is shown (I. and II.). Additionally, differences across groups in pre- and post-IFRS adoption periods are presented (III. and IV.).

Panel D presents the difference-in-differences between the transition group and the control group. The difference-in-differences is the difference in the longitudinal changes in ERCs of the transition group and the control group. It is also captured by coefficient β_7 .

The dependent variable *RET* is the 12-month stock return measured in the period beginning 3 months after year end of fiscal period t-1 and ending 3 months after year end of fiscal period t (derived from the Datastream variable RI).

All data is obtained from Datastream. Datastream coding is provided in brackets. The explanatory variables are defined as follows:

- E* are earnings (10010) of period t scaled by stock prices (05001) at the end of period t-1.
- US* is an indicator variable that is 1 if a firm first follows U.S. GAAP and then transitions to IFRS and 0 otherwise.
- POST* is an indicator variable that is 1 for periods after firms transitioned from U.S. GAAP to IFRS. For the firms out of the control group it is 1 if their matched counterpart out of the transition group transitioned to IFRS. The variable is 0 otherwise.

A vector of control variables includes the following:

- BTM* is the book-to-market ratio, calculated with equity (03501) over market capitalization (08001).
- SIZE* is the natural logarithm of market capitalization (08001).
- LEV* is calculated as total long term debt (03251) over total assets (02999).
- LOSS* is an indicator variable that is 1 if earnings are negative and 0 otherwise.

*, ** and *** indicate significance levels less than 10%, 5% and 1%, respectively.

2.4.2. Sub-sample tests (H2)

We test H2 using a subsample of firms that transition from U.S. GAAP to IFRS with larger *de facto* differences between financial statements prepared under U.S. GAAP and IFRS. Therefore we hand collect *de facto* differences between U.S. GAAP and IFRS incomes of the transition firms from income reconciliations, required by IFRS 1, from the first IFRS annual reports. All *de facto* differences are then scaled by U.S. GAAP income to determine the deviation from U.S. GAAP income. In a second step, all transition firms are ranked according to the magnitude of their relative *de facto* differences between U.S. GAAP and IFRS net incomes. We then determine the one-third of firms with the largest *de facto* differences between U.S. GAAP and IFRS net incomes. We use the one-third of firms with the largest *de facto* differences as these firms have IFRS income deviating more than 10% from U.S. GAAP income, which was regarded as a materiality threshold in prior studies (e.g. Adams et al. (1999)).⁹ Again we identify a control group of IFRS firms that is matched based on size.¹⁰

2.4.2.1. Descriptive statistics

Table 5 presents the distribution of the comparability index, showing that 16 out of 89 transitioning firms show no difference between U.S. GAAP and IFRS net incomes. 43.82% of the transition firms have a larger IFRS

⁹ Three out of the resulting 30 firms included in the subsample have a deviation slightly below 10% but are included after rounding at the first decimal place. Our results remain qualitatively the same if we use alternative sample splits as reported in Table 14 of the robustness tests section.

¹⁰ As *de facto* differences are scaled by U.S. GAAP income, we control if our results are driven by small earnings. The U.S. GAAP earnings of the firms with larger de-facto differences are equally distributed when earnings of all sample firms are ranked according to their absolute amounts. However, our results remain qualitatively the same when we exclude small earnings from our subsample tests.

income than U.S. GAAP income. 38.20% of the transition firms have a lower IFRS income relative to U.S. GAAP income.

Table 5: Comparability index – Relative income differences percentage distribution

$$\text{Comparability index} = 1 - \left(\frac{NI_{US} - NI_{IFRS}}{|NI_{US}|} \right)$$

Index	Frequency	Percentage	Cumulative
> 1.1	15	16.85	16.85
1.1 <> 1.05	5	5.62	22.47
1.05 <> 1.0	19	21.35	43.82
= 1	16	17.98	61.80
1.0 <> 0.95	15	16.85	78.65
0.95 <> 0.9	8	8.99	87.64
< 0.9	11	12.36	100
	89	100	

Table 5 presents the distribution of differences between U.S. GAAP and IFRS income relative to the absolute amount of U.S. GAAP income. We compare the differences between U.S. GAAP and IFRS income using a comparability index based on Gray (1980) that is larger than 1 if IFRS income is larger than U.S. GAAP income and equal to 1 if IFRS income is equal to U.S. GAAP income. The index is smaller than 1 if IFRS income is smaller than U.S. GAAP income. The more the index deviates from 1 the larger is the difference between U.S. GAAP and IFRS income.

We report descriptive statistics for individual reconciling items in Table 6. The most frequent reconciling items concern the employee benefits (41), intangible assets (30), share-based payments (29), provisions (23) and business combinations (23). The reconciling item pertaining taxation is reported frequently (49), as deferred tax adjustments are a consequence of prior income adjustments. Only for the reconciling item provisions, mean and median differ significantly from 1. This indicates that the accounting treatment of provisions under IFRS decreases income relative to U.S. GAAP. All other reconciling items do not show a distinct direction of a change from U.S. GAAP to IFRS income. While some of the accounting topics reflected by each reconciling item have already been addressed in completed convergence projects between

the FASB and IASB (e.g. business combinations, employee benefits), others still not have been part of the active agenda in the convergence process between FASB and IASB (e.g. provisions, intangibles). As these unresolved differences between standards still exist and, shown by the frequency of reconciling items, mainly contribute to differences between IFRS income and U.S. GAAP income, our study not decreases in relevance although some accounting standards have changed since the last firms transitioned from U.S. GAAP to IFRS in 2008.

We present descriptive statistics for the transition group and the control group in pre- and post-IFRS adoption periods in Table 7. All variables are truncated at the upper and lower two percent levels. Between pre- and post-IFRS adoption periods returns decrease for both subsamples, the transition group (pre-IFRS: mean = 0.37, median = 0.33; post-IFRS: mean = 0.18, median = 0.07) and the control group (pre-IFRS: mean = 0.46, median = 0.34; post-IFRS: mean = 0.29, mean = 0.08). Earnings are slightly larger in pre-IFRS adoption periods for the transition group (pre-IFRS: mean = 0.05, mean = 0.06) than for the control group (pre-IFRS: mean = -0.01, mean = 0.03). In post-IFRS adoption periods earnings are similar between the transition group (post-IFRS: mean = 0.01, mean = 0.05) and the control group (post-IFRS: mean = 0.02, mean = 0.05).

Table 6: Comparability index – Relative differences income statement items

$$\text{reconciling item}_i \text{ comparability index} = 1 - \left(\frac{\text{Reconciling item}_i}{|M_{US}|} \right)$$

Item	Frequency	Mean	Standard deviation	Min	0.25	Median	0.75	Max
Share based payments	29	-0.50	8.54	-44.88	1.00	1.01 **	1.05	2.68
Revenue recognition	11	1.01	0.05	0.91	0.98	1.01	1.05	1.08
Financial instruments	11	1.02	0.07	0.88	1.00	1.02	1.08	1.17
Leasing	7	0.96	0.20	0.52	0.97	1.00	1.06	1.13
Inventories	8	0.88	0.26	0.29	0.83	0.98	1.00	1.10
Property, plant and equipment	15	1.00	0.04	0.94	0.99	1.00	1.01	1.11
Employee benefits	41	0.96	0.35	-0.94	0.97	1.00	1.01	1.73
Provisions	23	1.11 *	0.30	0.82	1.00	1.02 ***	1.09	2.33
Consolidation	3	1.01	0.07	0.94	0.94	1.00	1.09	1.09
Foreign currency translations	1	1.01	-	1.01	1.01	1.01	1.01	1.01
Business combinations	23	1.12	0.35	0.41	0.96	1.01	1.15	2.10
Intangible assets	30	3.42	13.71	0.39	0.94	0.98 ***	1.00	76.00
Other	30	1.07	0.77	-0.69	1.00	1.00	1.01	4.79
Taxation	49	-0.54	10.89	-75.18	0.97	1.00	1.02	2.30

The table presents the frequency and magnitude of reconciling items of 89 reconciliations from U.S. GAAP to IFRS income. We use a reconciling item comparability index **based on Gray (1980)** to compare the magnitude of the 14 reconciling items. The comparability index divides the reconciliation amount through the absolute amount of U.S. GAAP income and subtracts it from 1. The index is smaller than 1 if the reconciling item between U.S. GAAP and IFRS is positive, i.e. increases IFRS income. The index is larger than 1 if the reconciling item between U.S. GAAP and IFRS income is negative, i.e. decreases IFRS income.

*, ** and *** indicate significance levels less than 10%, 5% and 1%, respectively and are calculated with T-tests for means and Wilcoxon signed-ranks tests for medians.

Table 7: Descriptive statistics – subsample analysis

Transition group - pre-IFRS adoption		Control group - pre-IFRS adoption						
	n	Mean	S.D.	Min	0.25	Mdn	0.75	Max
<i>E</i>	38	0.05	0.07	-0.10	0.00	0.06	0.09	0.19
change <i>E</i>	38	0.01	0.10	-0.25	-0.01	0.01	0.05	0.30
<i>RET</i>	38	0.37	0.57	-0.62	-0.06	0.33	0.67	1.86
<i>BTM</i>	38	0.77	0.43	0.12	0.39	0.76	1.01	1.81
<i>SIZE</i>	38	12.76	2.25	9.45	11.06	12.32	13.95	17.87
<i>LEV</i>	38	0.10	0.08	0.00	0.04	0.06	0.15	0.30
<i>LOSS</i>	38	0.24	0.43	0	0	0	0	1
Transition group - post-IFRS adoption		Control group - post-IFRS adoption						
	n	Mean	S.D.	Min	0.25	Mdn	0.75	Max
<i>E</i>	43	0.01	0.11	-0.34	-0.04	0.05	0.08	0.19
change <i>E</i>	40	0.01	0.15	-0.25	-0.05	0.01	0.04	0.80
<i>RET</i>	43	0.18	0.45	-0.63	-0.11	0.07	0.40	1.92
<i>BTM</i>	43	0.62	0.28	0.12	0.40	0.60	0.82	1.25
<i>SIZE</i>	43	12.61	2.09	10.03	10.91	12.32	13.59	18.04
<i>LEV</i>	43	0.09	0.07	0.00	0.03	0.08	0.14	0.24
<i>LOSS</i>	43	0.26	0.44	0	0	0	1	1

The four tables present descriptive statistics for all variables used in the subsample earnings informativeness test. We separate the data into four subgroups. The tables present the data for the firms that transition from U.S. GAAP to IFRS, in pre-IFRS and post-IFRS adoption periods, separately. Additionally, data for the control group is presented. The data of the control group is also separated into pre-IFRS and post-IFRS adoption periods, although these firms constantly follow IFRS. The data of a firm that belongs to the control group is assigned to pre-IFRS adoption period observations if its matched counterpart out of the transition group is still using U.S. GAAP in this particular period.

All data is obtained from the Datastream database. *E* are earnings of period *t* (10010) scaled by stock prices (05001) at the end of period *t*-1. Change *E* are changes of earnings in period *t* (10010) scaled by stock prices (05001) at the end of period *t*-1. *RET* is the 12-month stock return measured in the period beginning 3 month after year end of fiscal period *t*-1 and ending 3 month after year end of fiscal period *t* (derived from the Datastream variable *RI*). *BTM* is the book to market ratio, calculated with equity (03501) over market capitalization (08001). *SIZE* is the natural logarithm of market capitalization (08001). *LEV* is calculated as total long term debt (03251) over total assets (02999). *LOSS* is an indicator variable that is 1 if earnings are negative and 0 otherwise. All

variables are truncated on the upper and lower two percent level. Due to limited data availability the numbers of observations vary slightly between variables and subsamples.

2.4.2.2. Multivariate subsample test – earnings informativeness

Results of our multivariate subsample test are reported in Table 8. We find a significant association of returns and earnings for both of our two subsamples in the pre- and post-IFRS adoption periods, which is reflected by the ERCs in panel B. Panel C shows the differences in ERCs across subsamples in the pre- and post-IFRS adoption periods and the longitudinal changes in ERCs between the pre- and post-IFRS adoption periods. The ERC of our transition group (coefficient = 15.37, z-statistic = 5.00) is significantly lower in pre-IFRS adoption periods compared to the ERC of our control group (coefficient = 20.06, z-statistic = 6.48) in pre-IFRS adoption periods, and the difference between the coefficients (III.) is significant (difference in coefficients = -4.69, z-statistic = -3.18). This indicates that earnings informativeness is significantly lower for our sample firms that prepare their financial statements under U.S. GAAP compared to a control group of firms that prepares its financial statements under IFRS. We observe a significant increase in the ERC of the transition group after adoption of IFRS, which is represented by I. in panel C. The coefficient increases significantly by 4.63 (z-statistic = 3.71) after firms transition from U.S. GAAP to IFRS. We do not observe significant changes in the ERC of our control group between the pre- and post-IFRS adoption periods (II.). After adoption of IFRS, our transition group has a slightly larger ERC than our control group (difference in coefficients (IV.) = 2.39, z-statistic = 2.02); however, this difference in coefficients only holds at a significance level of 5% and is less pronounced than the observed differences between groups in pre-IFRS adoption periods. Our findings suggest that firms preparing their financial statements according to U.S. GAAP have significantly lower earnings informativeness than firms

preparing their financial statements according to IFRS. We also find a significant increase in earnings informativeness for firms that transition from U.S. GAAP to IFRS. If we use our control group to control for changes in earnings informativeness induced by other effects than change in accounting standards, the change in earnings informativeness is still significant and becomes even more pronounced. This is reflected in the difference-in-differences, i.e. β_7 , and is consistent with H_2 .

Again, the coefficient on the interaction of earnings and the *LOSS* dummy variable is significantly negative, as expected. We find a significantly negative incremental effect of *SIZE* on the ERC which is consistent with Freeman (1987). All other control variables remain insignificant.

We show that earnings informativeness can be affected by a switch from U.S. GAAP to IFRS. Our results suggest that earnings informativeness increases for firms with higher relative *de facto* differences between U.S. GAAP and IFRS incomes after transition to IFRS. The findings supports H_2 .

Table 8: Multivariate earnings informativeness results – subsample analysis

$$RET_{i,t} = \beta_0 + \beta_1 US_{i,t} + \beta_2 POST_{i,t} + \beta_3 E_{i,t} + \beta_4 US_{i,t} \times E_{i,t} + \beta_5 POST_{i,t} \times E_{i,t} + \beta_6 US_{i,t} \times POST_{i,t} + \beta_7 US_{i,t} \times POST_{i,t} \times E_{i,t} + \sum_{k=1}^4 \gamma_k X_{i,t-1}^k + \sum_{k=1}^4 \alpha_k E_{i,t} \times X_{i,t-1}^k + \varepsilon_{i,t}$$

Panel A						
R-squared	0.45		Number of observations		153	
Variable	Coefficient	Expected Sign	Coefficient	Standard Error	z	P> z
<i>US</i>	β_1		0.14	0.14	0.99	0.32
<i>POST</i>	β_2		-0.06	0.15	-0.38	0.70
<i>E</i>	β_3	+	20.06 ***	3.09	6.48	0.00
<i>US * E</i>	β_4	+/-	-4.69 ***	1.48	-3.18	0.00
<i>POST * E</i>	β_5	+/-	-2.45	1.69	-1.45	0.15
<i>US * POST</i>	β_6	+/-	-0.37 *	0.21	-1.78	0.08
<i>US * POST * E</i>	β_7	+/-	7.08 ***	2.11	3.35	0.00
<i>BTM</i>			0.10	0.11	0.88	0.38
<i>SIZE</i>			0.02	0.02	0.93	0.35
<i>LEV</i>			-0.32	0.42	-0.77	0.44
<i>LOSS</i>			-0.01	0.14	-0.11	0.92
<i>BTM * E</i>		+	-0.05	0.98	-0.05	0.96
<i>SIZE * E</i>		-	-0.97 ***	0.20	-4.99	0.00
<i>LEV * E</i>		-	3.55	4.22	0.84	0.40
<i>LOSS * E</i>		-	-11.13 ***	1.36	-8.19	0.00
Constant			-0.32	0.27	-1.18	0.24

Panel B					
Group Coefficients					
	Coefficient	Derivation	z	P> z	
A: Firm years control group pre-IFRS	20.06 ***	β_3	6.48	0.00	
B: Firm years control group post-IFRS	17.62 ***	$\beta_3 + \beta_5$	5.99	0.00	
C: Firm years transition group pre-IFRS	15.37 ***	$\beta_3 + \beta_4$	5.00	0.00	
D: Firm years transition group post-IFRS	20.00 ***	$\beta_3 + \beta_4 + \beta_5 + \beta_7$	6.72	0.00	

Panel C					
Differences Group Coefficients					
	Coefficient	Derivation	z	P> z	
I. Diff transition group pre/post	4.63 ***	D - C	3.71	0.00	
II. Diff control group pre/post	-2.45	B - A	-1.45	0.15	
III. Diff pre-adoption transition/control group	-4.69 ***	C - A	-3.18	-3.18	
IV. Diff post-adoption transition/control group	2.39 **	D - B	2.02	0.04	

Panel D					
Difference-in-Differences					
	Coefficient	Derivation	z	P> z	
Difference in pre/post adoption differences	7.08 ***	I. - II. (β_7)	3.35	0.00	

In panel A the table presents a regression of 12 months returns on earnings of a group of firms that switch from U.S. GAAP to IFRS and a group of firms that constantly follow IFRS. The second group is a control group consisting of firms that are matched counterparts of the transitioning firms. We estimate a panel regression with robust standard errors.

In panel B the table presents the group coefficients that are derived from linear combinations of the estimators from the regression model. We report four group coefficients; First, the coefficient for firms out of the control group for periods before their matched counterparts transition to IFRS (A). Second, the coefficient for firms out of the control group for periods after their matched counterparts transitioned to IFRS (B). Third, the coefficient of firms that transition from U.S. GAAP to IFRS in pre-IFRS adoption periods (C). And fourth, the coefficient of firms that transition from U.S. GAAP to IFRS in post-IFRS adoption periods (D).

Panel C presents the differences between group coefficients. For each group the longitudinal change between pre- and post-IFRS adoption periods is shown (I. and II.). Additionally, differences across groups in pre- and post-IFRS adoption periods are presented (III. and IV.).

Panel D presents the difference-in-differences between the transition group and the control group. The difference-in-differences is the difference in the longitudinal changes in ERCs of the transition group and the control group. It is also captured by coefficient β_7 .

The dependent variable *RET* is the 12-month stock return measured in the period beginning 3 months after year end of fiscal period t-1 and ending 3 months after year end of fiscal period t (derived from the Datastream variable RI).

All data is obtained from Datastream. Datastream coding is provided in brackets. The explanatory variables are defined as follows:

- E* are earnings (10010) of period t scaled by stock prices (05001) at the end of period t-1.
- US* is an indicator variable that is 1 if a firm first follows U.S. GAAP and then transitions to IFRS and 0 otherwise.
- POST* is an indicator variable that is 1 for periods after firms transitioned from U.S. GAAP to IFRS. For the firms out of the control group it is 1 if their matched counterpart out of the transition group transitioned to IFRS. The variable is 0 otherwise.

A vector of control variables includes the following:

- BTM* is the book-to-market ratio, calculated with equity (03501) over market capitalization (08001).
- SIZE* is the natural logarithm of market capitalization (08001).
- LEV* is calculated as total long term debt (03251) over total assets (02999).
- LOSS* is an indicator variable that is 1 if earnings are negative and 0 otherwise.

*, ** and *** indicate significance levels less than 10%, 5% and 1%, respectively.

2.5. Robustness tests

2.5.1. Addressing potential selection bias

Before 2005, publicly traded German firms were permitted to apply either U.S. GAAP or IFRS in their consolidated financial statements instead of German GAAP. Firms individually decided which accounting system to adopt. Most of these firms made this decision well in advance of 2005. To alleviate the concern of potential selection bias induced by this choice, we implement a two-stage Heckman procedure (Heckman (1979)). At the first stage, we calculate the Inverse Mills Ratio (*IMR*) from a probit regression modeling a firm's propensity to adopt U.S. GAAP (instead of IFRS).¹¹ At the second stage, we include the *IMR* in our earnings informativeness regressions to control for possible selection bias.

Consistent with prior literature (e.g., Ashbaugh, 2001; Tarca, 2004; Van der Meulen et al., 2006; Weißenberger et al., 2004), we model a firm's propensity to adopt either U.S. GAAP or IFRS as a function of two sets of variables. First, we include measures of firm characteristics associated with a firm's propensity to provide more versus less informative disclosures because if one accounting regime is perceived to be more informative than another, a firm trying to provide more informative disclosures will choose this accounting regime. These characteristics are size, performance, ownership dispersion, growth (financing needs) and leverage (e.g., Lang and Lundholm, 1993; Leuz and Verrecchia, 2000; Makhija and Patton, 2004; Raffournier, 1995; Iatridis, 2008). Our proxies for these properties are the natural logarithm of market capitalization, *SIZE*, return on assets, *ROA*, closely held shares divided by

¹¹We do not model firms' choice between German GAAP relative to U.S. GAAP or IFRS as we focus on a possible selection bias that is only driven by the choice between U.S. GAAP and IFRS, given that our sample excludes German-GAAP firms.

common shares outstanding, *CLOSE*, revenue growth, *REVG*, and long-term debt over total assets, *LEV*.

Second, we include variables expected to relate to a firms' choice between U.S. GAAP and IFRS. In analogy to prior literature (Ashbaugh (2001); Tarca (2004); Weißenberger et al. (2004)), we expect firms cross-listed in the U.S., either via direct listing or indirectly via an American Depositary Receipt (ADR) program, to choose U.S. GAAP in order to minimize compliance costs and to attract U.S. investors who are more familiar with U.S. GAAP. We include an indicator variable, *ADI*, that is 1 if the shares of a firm are traded directly or indirectly in the U.S. To capture time and network effects, we further include an indicator variable, *EARLYAD*, that is 1 for firms that adopted U.S. GAAP or IFRS before the year 2000, because the time point of IFRS or U.S. GAAP adoption might influence the decision for one of the two accounting systems. Relative to U.S. GAAP, IFRS is a new set of accounting standards that was not as established as U.S. GAAP early on. This perception might have changed over time. Also, network effects might play an important role in the adoption decision (Ramanna and Sletten 2009). Firms might obtain benefits from adopting a set of accounting standards that is widely used by others. As IFRS were not as established as U.S. GAAP and became more prevalent in Germany and the EU from 2000 onwards, synchronization effects have increased and can affect accounting standard choice in favor of IFRS. Furthermore, we include a vector of industry indicator variables representing the SIC 1 sectors as industry/sector affiliation is likely to influence the choice of a set of accounting standards. All variables are included in the following multivariate probit regression model:

$$\begin{aligned} \text{Probit (U.S. GAAP = 1)} = & \beta_0 + \beta_1 \text{SIZE}_j + \beta_2 \text{CLOSE}_j + \beta_3 \text{ROA}_j + \beta_4 \text{REVG}_j \\ & + \beta_5 \text{LEV}_j + \beta_6 \text{ADI}_j + \beta_7 \text{EARLYAD}_j + \sum \alpha_k \text{INDUSTRY}_j \quad (3) \end{aligned}$$

The dependent variable is U.S. GAAP, an indicator variable that is 1 for firms following U.S. GAAP (i.e., firms that belong to the transition group), and 0 otherwise. We calculate the inverse Mills ratios (*IMRs*) based on the results of model (3).

Results from estimating model (3) for the entire sample are presented in Table 9. We find that *EARLYAD* (coefficient = 1.33, z-statistic = 4.34) has the predicted sign and is significantly positively correlated with the choice of U.S. GAAP. *ADI* (coefficient = 0.99, z-statistic = 2.7) is significant at a 1% level, and is also positively correlated with *U.S. GAAP*, as predicted. All other variables are insignificant.

We re-estimate our earnings informativeness regressions, including as additional control variables the *IMRs* and their interaction with earnings. Table 10 for the entire sample and Table 11 for the subsample show that results are similar compared to our prior tests. The interactions between earnings and *IMRs* are insignificant, indicating that the association between returns and earnings is not affected by factors driving the accounting standard choice.

Table 9: Multivariate accounting choice model results

$$\text{Probit (U.S. GAAP = 1)} = \beta_0 + \beta_1 \text{SIZE}_j + \beta_2 \text{CLOSE}_j + \beta_3 \text{ROA}_j + \beta_4 \text{REVG}_j + \beta_5 \text{LEV}_j + \beta_6 \text{ADI}_j + \beta_7 \text{EARLYAD}_j + \sum \alpha_k \text{INDUSTRY}_j$$

Pseudo R-squared		0.17		Number of observations		171	
Variable	Expected		Standard				
	Sign	Coefficient	Error	z	P> z		
<i>SIZE</i>	+/-	-0.07	0.08	-0.85	0.39		
<i>CLOSE</i>	+/-	0.23	0.37	0.62	0.54		
<i>ROA</i>	+/-	0.00	0.01	-0.09	0.93		
<i>REVG</i>	+/-	-0.08	0.47	-0.16	0.87		
<i>LEV</i>	+/-	-0.94	0.84	-1.12	0.26		
<i>ADI</i>	+	0.99 ***	0.37	2.70	0.01		
<i>EARLYAD</i>	+	1.33 ***	0.31	4.34	0.00		
Industry dummies	+/-	included	-	-	-		
Constant		0.16	1.07	0.15	0.88		

The table presents a probit regression examining the determinants of a firms' decision to adopt U.S. GAAP instead of IFRS. The dependent variable is an indicator variable that is 1 if a firm follows U.S. GAAP and 0 if a firm follows IFRS.

The explanatory variables are defined as follows:

- SIZE* is the natural logarithm of market capitalization. Market capitalization is the closing price of the company's stock at fiscal year end times the number of common shares outstanding at year end. The variable serves as a proxy for firm size. The data is obtained from Datastream (08001).
- CLOSE* closely held shares divided by common shares outstanding. Closely held shares represent the shares held by insiders, e.g. individuals that hold at least 5% of the outstanding shares. Common shares outstanding are the number of common shares outstanding at the current year end. The variable serves as a proxy for ownership dispersion. The data is obtained from Datastream (05475/05301).
- ROA* return on assets. Return on assets is net income before preferred dividends after tax, divided by the average of last year's and the current year's periods total assets. *ROA* serves as a proxy for performance. The data is obtained from Datastream (08326).
- REVG* revenue growth ($\text{revenue}_t / \text{revenue}_{t-1} - 1$). Revenue growth is the growth in revenues of the current period (t) relative to the last period's revenues (t-1). Revenues represent the gross sales and operating revenues. *REVG* serves as proxy for capital needs. The data is obtained from Datastream (01001).
- LEV* is calculated as the ratio of long term debt to total assets. Long term debt consists of all interest bearing obligations excluding amounts that are due within one year. Long term debt is divided by total assets. *LEV* serves as a proxy for the amount of debt financing of a company. The data is obtained from Datastream (03251/02999).
- ADI* is an indicator variable that is 1 if the shares of a firm are traded in the U.S. The shares can be traded directly or indirectly via American Depositary Receipts (ADRs). *ADI* is expected to be positively correlated with a firms' choice to follow U.S. GAAP. The data is obtained from the BNY Mellon depositary receipt directory.
- EARLYAD* is an indicator variable that is 1 if an international accounting system is adopted before the year 2000. The accounting system followed is identified via the Datastream variable 07536. *EARLYAD* captures time effects and also serves as a proxy for network effects.

All variables are winsorized at a 5% level.

*, ** and *** indicate significance levels less than 10%, 5% and 1%, respectively.

Table 10: Multivariate earnings informativeness results including selection bias control – full sample analysis

$$RET_{i,t} = \beta_0 + \beta_1 US_{i,t} + \beta_2 POST_{i,t} + \beta_3 E_{i,t} + \beta_4 US_{i,t} \times E_{i,t} + \beta_5 POST_{i,t} \times E_{i,t} + \beta_6 US_{i,t} \times POST_{i,t} + \beta_7 US_{i,t} \times POST_{i,t} \times E_{i,t} + \sum_{k=1}^5 \gamma_k X_{i,t-1}^k + \sum_{k=1}^5 \alpha_k E_{i,t} \times X_{i,t-1}^k + \varepsilon_{i,t}$$

Panel A							
R-squared	0.20			Number of observations		464	
Variable	Coefficient	Expected Sign	Coefficient	Standard Error	z	P> z	
<i>US</i>	β_1		0.22	0.14	1.60	0.11	
<i>POST</i>	β_2		-0.05	0.06	-0.86	0.39	
<i>E</i>	β_3	+	6.57 ***	2.07	3.17	0.00	
<i>US * E</i>	β_4	+/-	-0.70	1.12	-0.63	0.53	
<i>POST * E</i>	β_5	+/-	-0.46	0.38	-1.20	0.23	
<i>US * POST</i>	β_6	+/-	-0.10	0.10	-1.05	0.29	
<i>US * POST * E</i>	β_7	+/-	0.16	0.69	0.23	0.81	
<i>BTM</i>			0.40 ***	0.08	5.11	0.00	
<i>SIZE</i>			-0.02	0.02	-1.49	0.14	
<i>LEV</i>			0.40	0.28	1.43	0.15	
<i>LOSS</i>			0.11	0.10	1.10	0.27	
<i>IMR</i>			-0.08	0.09	-0.84	0.40	
<i>BTM * E</i>		+	-0.45 *	0.24	-1.85	0.06	
<i>SIZE * E</i>		-	-0.09	0.11	-0.85	0.39	
<i>LEV * E</i>		-	-0.40	1.57	-0.26	0.80	
<i>LOSS * E</i>		-	-4.32 ***	0.97	-4.46	0.00	
<i>IMR * E</i>		+/-	0.11	0.72	0.16	0.87	
Constant			-0.10	0.23	-0.44	0.66	

Panel B					
Group Coefficients					
	Coefficient	Derivation	z	P> z	
A: Firm years control group pre-IFRS	6.57 ***	β_3	3.17	0.00	
B: Firm years control group post-IFRS	6.11 ***	$\beta_3 + \beta_5$	3.14	0.00	
C: Firm years transition group pre-IFRS	5.87 ***	$\beta_3 + \beta_4$	3.86	0.00	
D: Firm years transition group post-IFRS	5.57 ***	$\beta_3 + \beta_4 + \beta_5 + \beta_7$	3.51	0.00	

Panel C					
Differences Group Coefficients					
	Coefficient	Derivation	z	P> z	
I. Diff transition group pre/post	-0.30	D - C	-0.51	0.61	
II. Diff control group pre/post	-0.46	B - A	-1.20	0.23	
III. Diff pre-adoption transition/control group	-0.70	C - A	-0.63	0.53	
IV. Diff post-adoption transition/control group	-0.54	D - B	-0.62	0.54	

Panel D					
Difference-in-Differences					
	Coefficient	Derivation	z	P> z	
Difference in pre/post adoption differences	0.16	I. - II. (β_7)	0.23	0.81	

In panel A the table presents a regression of 12 months returns on earnings of a group of firms that switch from U.S. GAAP to IFRS and a group of firms that constantly follow IFRS. The second group is a control group consisting of firms that are matched counterparts of the transitioning firms. We estimate a panel regression with robust standard errors.

In panel B the table presents the group coefficients that are derived from linear combinations of the estimators from the regression model. We report four group coefficients; First, the coefficient for firms out of the control group for periods before their matched counterparts transition to IFRS (A). Second, the coefficient for firms out of the control group for periods after their matched counterparts transitioned to IFRS (B). Third, the coefficient of firms that transition from U.S. GAAP to IFRS in pre-IFRS adoption periods (C). And fourth, the coefficient of firms that transition from U.S. GAAP to IFRS in post-IFRS adoption periods (D).

Panel C presents the differences between group coefficients. For each group the longitudinal change between pre- and post-IFRS adoption periods is shown (I. and II.). Additionally, differences across groups in pre- and post-IFRS adoption periods are presented (III. and IV.).

Panel D presents the difference-in-differences between the transition group and the control group. The difference-in-differences is the difference in the longitudinal changes in ERCs of the transition group and the control group. It is also captured by coefficient β_7 .

The dependent variable *RET* is the 12-month stock return measured in the period beginning 3 months after year end of fiscal period t-1 and ending 3 months after year end of fiscal period t (derived from the Datastream variable RI).

All data is obtained from Datastream. Datastream coding is provided in brackets. The explanatory variables are defined as follows:

- E* are earnings (10010) of period t scaled by stock prices (05001) at the end of period t-1.
- US* is an indicator variable that is 1 if a firm first follows U.S. GAAP and then transitions to IFRS and 0 otherwise.
- POST* is an indicator variable that is 1 for periods after firms transitioned from U.S. GAAP to IFRS. For the firms out of the control group it is 1 if their matched counterpart out of the transition group transitioned to IFRS. The variable is 0 otherwise.

A vector of control variables includes the following:

- BTM* is the book-to-market ratio, calculated with equity (03501) over market capitalization (08001).
- SIZE* is the natural logarithm of market capitalization (08001).
- LEV* is calculated as total long term debt (03251) over total assets (02999).
- LOSS* is an indicator variable that is 1 if earnings are negative and 0 otherwise.
- IMR* is the Inverse Mills Ratio derived from the first stage accounting choice model. It is included in the second stage model, the earnings informativeness test, to control for a possible selection bias.

*, ** and *** indicate significance levels less than 10%, 5% and 1%, respectively.

Table 11: Multivariate earnings informativeness results including selection bias control – subsample analysis

$$RET_{i,t} = \beta_0 + \beta_1 US_{i,t} + \beta_2 POST_{i,t} + \beta_3 E_{i,t} + \beta_4 US_{i,t} \times E_{i,t} + \beta_5 POST_{i,t} \times E_{i,t} + \beta_6 US_{i,t} \times POST_{i,t} + \beta_7 US_{i,t} \times POST_{i,t} \times E_{i,t} + \sum_{k=1}^5 \gamma_k X_{i,t-1}^k + \sum_{k=1}^5 \alpha_k E_{i,t} \times X_{i,t-1}^k + \varepsilon_{i,t}$$

Panel A						
R-squared	0.46		Number of observations		153	
Variable	Coefficient	Expected Sign	Coefficient	Standard Error	z	P> z
<i>US</i>	β_1		0.33	0.21	1.58	0.11
<i>POST</i>	β_2		-0.06	0.14	-0.46	0.64
<i>E</i>	β_3	+	21.11 ***	3.18	6.64	0.00
<i>US * E</i>	β_4	+/-	-6.51 ***	2.31	-2.82	0.00
<i>POST * E</i>	β_5	+/-	-2.02	1.36	-1.48	0.14
<i>US * POST</i>	β_6	+/-	-0.35 *	0.20	-1.75	0.08
<i>US * POST * E</i>	β_7	+/-	6.50 ***	1.91	3.39	0.00
<i>BTM</i>			0.11	0.11	1.00	0.32
<i>SIZE</i>			0.03	0.02	1.10	0.27
<i>LEV</i>			-0.33	0.40	-0.84	0.40
<i>LOSS</i>			0.00	0.14	0.00	1.00
<i>IMR</i>			-0.14	0.12	-1.18	0.24
<i>BTM * E</i>		+	0.03	0.80	0.04	0.97
<i>SIZE * E</i>		-	-1.02 ***	0.21	-4.84	0.00
<i>LEV * E</i>		-	3.88	4.07	0.95	0.34
<i>LOSS * E</i>		-	-10.87 ***	1.33	-8.20	0.00
<i>IMR * E</i>		+/-	1.54	1.39	1.11	0.27
Constant			-0.47	0.32	-1.49	0.14

Panel B					
Group Coefficients					
	Coefficient	Derivation	z	P> z	
A: Firm years control group pre-IFRS	21.11 ***	β_3	6.64	0.00	
B: Firm years control group post-IFRS	19.10 ***	$\beta_3 + \beta_5$	6.04	0.00	
C: Firm years transition group pre-IFRS	14.61 ***	$\beta_3 + \beta_4$	4.34	0.00	
D: Firm years transition group post-IFRS	19.09 ***	$\beta_3 + \beta_4 + \beta_5 + \beta_7$	5.56	0.00	

Panel C					
Differences Group Coefficients					
	Coefficient	Derivation	z	P> z	
I. Diff transition group pre/post	4.48 ***	D - C	3.48	0.00	
II. Diff control group pre/post	-2.02	B - A	-1.48	0.14	
III. Diff pre-adoption transition/control group	-6.51 ***	C - A	-2.82	0.01	
IV. Diff post-adoption transition/control group	-0.01	D - B	0.00	1.00	

Panel D					
Difference-in-Differences					
	Coefficient	Derivation	z	P> z	
Difference in pre/post adoption differences	6.50 ***	I. - II. (β_7)	3.39	0.00	

In panel A the table presents a regression of 12 months returns on earnings of a group of firms that switch from U.S. GAAP to IFRS and a group of firms that constantly follow IFRS. The second group is a control group consisting of firms that are matched counterparts of the transitioning firms. We estimate a panel regression with robust standard errors.

In panel B the table presents the group coefficients that are derived from linear combinations of the estimators from the regression model. We report four group coefficients; First, the coefficient for firms out of the control group for periods before their matched counterparts transition to IFRS (A). Second, the coefficient for firms out of the control group for periods after their matched counterparts transitioned to IFRS (B). Third, the coefficient of firms that transition from U.S. GAAP to IFRS in pre-IFRS adoption periods (C). And fourth, the coefficient of firms that transition from U.S. GAAP to IFRS in post-IFRS adoption periods (D).

Panel C presents the differences between group coefficients. For each group the longitudinal change between pre- and post-IFRS adoption periods is shown (I. and II.). Additionally, differences across groups in pre- and post-IFRS adoption periods are presented (III. and IV.).

Panel D presents the difference-in-differences between the transition group and the control group. The difference-in-differences is the difference in the longitudinal changes in ERCs of the transition group and the control group. It is also captured by coefficient β_7 .

The dependent variable *RET* is the 12-month stock return measured in the period beginning 3 months after year end of fiscal period t-1 and ending 3 months after year end of fiscal period t (derived from the Datastream variable RI).

All data is obtained from Datastream. Datastream coding is provided in brackets. The explanatory variables are defined as follows:

- E* are earnings (10010) of period t scaled by stock prices (05001) at the end of period t-1.
US is an indicator variable that is 1 if a firm first follows U.S. GAAP and then transitions to IFRS and 0 otherwise.
POST is an indicator variable that is 1 for periods after firms transitioned from U.S. GAAP to IFRS. For the firms out of the control group it is 1 if their matched counterpart out of the transition group transitioned to IFRS. The variable is 0 otherwise.

A vector of control variables includes the following:

- BTM* is the book-to-market ratio, calculated with equity (03501) over market capitalization (08001).
SIZE is the natural logarithm of market capitalization (08001).
LEV is calculated as total long term debt (03251) over total assets (02999).
LOSS is an indicator variable that is 1 if earnings are negative and 0 otherwise.
IMR is the Inverse Mills Ratio derived from the first stage accounting choice model. It is included in the second stage model, the earnings informativeness test, to control for a possible selection bias.

*, ** and *** indicate significance levels less than 10%, 5% and 1%, respectively.

2.5.2. Earnings persistence test

As prior literature shows that earnings persistence influences ERCs (Collins and Kothari (1989)), we follow Hanlon et al. (2008) and conduct an earnings persistence test (Lev, 1983). To mitigate concerns that our results are driven by changes in earnings persistence, we investigate if persistence differs between U.S. GAAP and IFRS firms, and if earnings persistence changes after transition from U.S. GAAP to IFRS. Our basic regression is the following:

$$E_{i,t} = \beta_0 + \beta_1 E_{i,t-1} + \varepsilon_{i,t} \quad (4)$$

We modify this regression to implement our difference-in-differences research design. In analogy to our earnings informativeness test, we add the indicator variables *POST* and *US* defined before to derive the following regression equation:

$$\begin{aligned} E_{i,t} = & \beta_0 + \beta_1 US_{i,t} + \beta_2 POST_{i,t} + \beta_3 E_{i,t-1} + \beta_4 US_{i,t} \times E_{i,t-1} + \beta_5 POST_{i,t} \times E_{i,t-1} \\ & + \beta_6 US_{i,t} \times POST_{i,t} + \beta_7 US_{i,t} \times POST_{i,t} \times E_{i,t-1} + \varepsilon_{i,t} \end{aligned} \quad (5)$$

All interaction terms are interpreted as before, the only difference being that the coefficients now capture earnings persistence instead of earnings informativeness.

Panel A of Table 12 presents the results of our regression of earnings on lagged earnings. The coefficient β_3 (coefficient = 0.21, z-statistic = 2.60) shows that earnings of the control firms in pre-IFRS adoption periods are significantly positively related to earnings of the next future period. β_4 (coefficient = 0.14, z-statistic = 0.97) is insignificant and shows that firms following U.S. GAAP do not have a larger or lower earnings persistence than firms following IFRS. Coefficient β_5 (coefficient = 0.22, z-statistic = 1.26) is

insignificant and indicates that there is no change in earnings persistence for the control firms between pre- and post-IFRS adoption periods.

Panel B of Table 12 reports the group coefficients of the transition group and the control group in pre- and post-IFRS adoption periods. Again, we derive the group coefficients as linear combinations of the estimators of the regression model. They are all positive and significant.

Our findings indicate no changes in earnings persistence for the control and the transition firms. Hence, for the full sample changes in earnings informativeness are unlikely to be driven by changes earnings persistence.

For our subsample of firms with the largest *de-facto* differences between U.S. GAAP and IFRS incomes, we present the results of the earnings persistence test in Table 13. We do not find any significant changes in earnings persistence between the transition group and the control group in pre- and post-IFRS adoption periods, as indicated by panel C of Table 13. The observed increase in earnings informativeness of the transition group hence is not driven by an increase in earnings persistence.

Table 12: Multivariate earnings persistence results – full sample analysis

$$E_{i,t} = \beta_0 + \beta_1 US_{i,t} + \beta_2 POST_{i,t} + \beta_3 E_{i,t-1} + \beta_4 US_{i,t} \times E_{i,t-1} + \beta_5 POST_{i,t} \times E_{i,t-1} + \beta_6 US_{i,t} \times POST_{i,t} + \beta_7 US_{i,t} \times POST_{i,t} \times E_{i,t-1} + \varepsilon_{i,t}$$

Panel A						
R-squared	0.20		Number of observations		464	
Variable	Coefficient	Expected Sign	Coefficient	Standard Error	z	P> z
<i>US</i>	β_1		0.03	0.03	1.11	0.27
<i>POST</i>	β_2		0.07 **	0.03	2.43	0.02
<i>E</i>	β_3	+	0.21 ***	0.08	2.60	0.01
<i>US * E</i>	β_4	+/-	0.14	0.15	0.97	0.33
<i>POST * E</i>	β_5	+/-	0.22	0.18	1.26	0.21
<i>US * POST</i>	β_6	+/-	-0.04	0.04	-1.23	0.22
<i>US * POST * E</i>	β_7	+/-	-0.21	0.23	-0.91	0.36
Constant			-0.06 **	0.03	-2.28	0.02

Panel B					
Group Coefficients					
	Coefficient	Derivation	z	P> z	
A: Firm years control group pre-IFRS	0.21 ***	β_3	2.60	0.01	
B: Firm years control group post-IFRS	0.43 **	$\beta_3 + \beta_5$	2.51	0.01	
C: Firm years transition group pre-IFRS	0.35 ***	$\beta_3 + \beta_4$	2.83	0.01	
D: Firm years transition group post-IFRS	0.36 ***	$\beta_3 + \beta_4 + \beta_5 + \beta_7$	3.43	0.00	

Panel C					
Differences Group Coefficients					
	Coefficient	Derivation	z	P> z	
I. Diff transition group pre/post	0.01	D - C	0.09	0.93	
II. Diff control group pre/post	0.22	B - A	1.26	0.21	
III. Diff pre-adoption transition/control group	0.14	C - A	0.97	0.33	
IV. Diff post-adoption transition/control group	-0.07	D - B	-0.34	0.73	

Panel D					
Difference-in-Differences					
	Coefficient	Derivation	z	P> z	
Difference in pre/post adoption differences	-0.21	I. - II. (β_7)	-0.91	0.36	

In panel A the table presents a regression examining the changes in earnings persistence for a group of firms that transition from U.S. GAAP to IFRS and of a group of firms that constantly follow IFRS. The second group is a control group that consists of firms that are matched counterparts of the firms out of the transition group. We estimate a panel regression with robust standard errors.

In panel B the table presents the group coefficients that are derived as linear combinations of the estimators from the regression model. We report four group coefficients; First, the coefficient for firms out of the control group for periods before their matched counterparts transition to IFRS. Second, the coefficient for firms out of the control group for periods after their matched counterparts transitioned to IFRS. Third, the coefficient of firms that transition from U.S. GAAP to IFRS in pre-IFRS adoption periods. And fourth, the coefficient of firms that transition from U.S. GAAP to IFRS in post-IFRS adoption periods.

Panel C presents differences in earnings persistence between pre- and post-IFRS adoption periods for both groups (I. and II.) and differences in earnings persistence between the transition group and the control group in pre-IFRS adoption periods (III.) and post-IFRS adoption periods (IV.).

Panel D presents the difference-in-differences between earnings persistence of the transition group and the control group. The difference-in-difference is the difference in the longitudinal changes in earnings persistence of the transition group and the control group. It is also captured in coefficient β_7 .

The dependent variable E is earnings of period t scaled by stock prices (05001) at the end of period $t-1$ (both variables are derived from the Datastream database (10010)/(05001)).

All data is obtained from Datastream. Datastream coding is provided in brackets. The explanatory variables are defined as follows:

- E are earnings (10010) of period t scaled by stock prices (05001) at the end of period $t-1$. Earnings are partly hand-collected from the annual reports of the firms transitioning from U.S. GAAP to IFRS. The first IFRS annual report provides financial statements from the prior period. We take this financial data to derive our lagged IFRS-earnings for the first period in which a transitioning firm reports under IFRS.
- US is an indicator variable that is 1 if a firm follows U.S. GAAP and transitions to IFRS and 0 otherwise.
- $POST$ is an indicator variable that is 1 for periods after firms transitioned from U.S. GAAP to IFRS. For the firms out of the control group it is 1 if their matched counterpart out of the transition group transitioned to IFRS. The variable is 0 otherwise.

*, ** and *** indicate significance levels less than 10%, 5% and 1%, respectively.

Table 13: Multivariate earnings persistence results – subsample analysis

$$E_{i,t} = \beta_0 + \beta_1 US_{i,t} + \beta_2 POST_{i,t} + \beta_3 E_{i,t-1} + \beta_4 US_{i,t} \times E_{i,t-1} + \beta_5 POST_{i,t} \times E_{i,t-1} + \beta_6 US_{i,t} \times POST_{i,t} + \beta_7 US_{i,t} \times POST_{i,t} \times E_{i,t-1} + \varepsilon_{i,t}$$

Panel A						
R-squared	0.09		Number of observations		153	
Variable	Coefficient	Expected Sign	Coefficient	Standard Error	z	P> z
<i>US</i>	β_1		0.07	0.05	1.55	0.12
<i>POST</i>	β_2		0.05	0.04	1.29	0.20
<i>E</i>	β_3	+	0.01	0.17	0.08	0.94
<i>US * E</i>	β_4	+/-	0.21	0.20	1.05	0.29
<i>POST * E</i>	β_5	+/-	0.19	0.18	1.02	0.31
<i>US * POST</i>	β_6	+/-	-0.08	0.05	-1.62	0.11
<i>US * POST * E</i>	β_7	+/-	0.00	0.38	0.01	1.00
Constant			-0.04	0.04	-0.80	0.43

Panel B					
Group Coefficients					
	Coefficient	Derivation	z	P> z	
A: Firm years control group pre-IFRS	0.01	β_3	0.08	0.94	
B: Firm years control group post-IFRS	0.20 ***	$\beta_3 + \beta_5$	3.13	0.00	
C: Firm years transition group pre-IFRS	0.23 **	$\beta_3 + \beta_4$	2.10	0.04	
D: Firm years transition group post-IFRS	0.42	$\beta_3 + \beta_4 + \beta_5 + \beta_7$	1.38	0.17	

Panel C					
Differences Group Coefficients					
	Coefficient	Derivation	z	P> z	
I. Diff transition group pre/post	0.19	D - C	0.56	0.57	
II. Diff control group pre/post	0.19	B - A	1.02	0.31	
III. Diff pre-adoption transition/control group	0.21	C - A	1.05	0.29	
IV. Diff post-adoption transition/control group	0.22	D - B	0.70	0.48	

Panel D					
Difference-in-Differences					
	Coefficient	Derivation	z	P> z	
Difference in pre/post adoption differences	0.00	I. - II. (β_7)	0.01	1.00	

In panel A the table presents a regression examining the changes in earnings persistence for a group of firms that transition from U.S. GAAP to IFRS and of a group of firms that constantly follow IFRS. The second group is a control group that consists of firms that are matched counterparts of the firms out of the transition group. We estimate a panel regression with robust standard errors.

In panel B the table presents the group coefficients that are derived as linear combinations of the estimators from the regression model. We report four group coefficients; First, the coefficient for firms out of the control group for periods before their matched counterparts transition to IFRS. Second, the coefficient for firms out of the control group for periods after their matched counterparts transitioned to IFRS. Third, the coefficient of firms that transition from U.S. GAAP to IFRS in pre-IFRS adoption

periods. And fourth, the coefficient of firms that transition from U.S. GAAP to IFRS in post-IFRS adoption periods.

Panel C presents differences in earnings persistence between pre- and post-IFRS adoption periods for both groups (I. and II.) and differences in earnings persistence between the transition group and the control group in pre-IFRS adoption periods (III.) and post-IFRS adoption periods (IV.).

Panel D presents the difference-in-differences between earnings persistence of the transition group and the control group. The difference-in-difference is the difference in the longitudinal changes in earnings persistence of the transition group and the control group. It is also captured in coefficient β_7 .

The dependent variable E is earnings of period t scaled by stock prices (05001) at the end of period $t-1$ (both variables are derived from the Datastream database (10010)/(05001)).

All data is obtained from Datastream. Datastream coding is provided in brackets. The explanatory variables are defined as follows:

- E are earnings (10010) of period t scaled by stock prices (05001) at the end of period $t-1$. Earnings are partly hand-collected from the annual reports of the firms transitioning from U.S. GAAP to IFRS. The first IFRS annual report provides financial statements from the prior period. We take this financial data to derive our lagged IFRS-earnings for the first period in which a transitioning firm reports under IFRS.
- US is an indicator variable that is 1 if a firm follows U.S. GAAP and transitions to IFRS and 0 otherwise.
- $POST$ is an indicator variable that is 1 for periods after firms transitioned from U.S. GAAP to IFRS. For the firms out of the control group it is 1 if their matched counterpart out of the transition group transitioned to IFRS. The variable is 0 otherwise.

*, ** and *** indicate significance levels less than 10%, 5% and 1%, respectively.

2.5.3. Variable measurement

We check if our tests are sensitive to a different variable measurement as results might be affected by a different measurement of returns. Besides 12 month returns measured between April and March, also 15 month returns measured between January and March are commonly used for earnings informativeness tests. We rerun our tests using 15 month returns and derive similar results for the entire sample and our subsample.

Following prior studies (Easton and Harris (1991) and Francis et al. (2005)) we also regress 12-month stock returns (RET) on levels of earnings of fiscal period t (E) and changes in earnings of fiscal period t . We consider levels of earnings and changes in earnings as they might explain more of the returns than levels of earnings considered alone. They can be viewed as complements in explaining stock returns (Easton and Harris (1991)). In line with Francis et al. (2005) we then measure earnings informativeness as linear combination of the coefficients on levels of earnings and changes in earnings. Our results remain qualitatively the same for all regression specifications.

2.5.4. Outlier treatment

We check whether our results are sensitive to a different outlier treatment and winsorize all variables at different levels. Results are robust for the regressions of returns on earnings and returns on earnings and changes in earnings.

2.5.5. Identification of control group

For our tests we identify the control group by matching all transition firms on firms that constantly follow IFRS based on size. We test if our results

are sensitive to different control group identification and match our sample based on industry and size. Our results do not change for the entire sample. Results are the same for the subsample but with slightly lower levels of significance. The change in earnings informativeness for the transition firms after transition to IFRS and after controlling for other influencing factors than a change in the accounting system is significant at a 5% level instead of a 1% level. Although the direction of coefficients does not change for regressions of returns on earnings and changes in earnings, compared to our prior tests, our results become insignificant, which might be due to a lack of statistical power as our sample size decreases due to a lack of appropriate matches.

2.5.6. Sample split

For our subsample tests, we rank all transition firms according to their magnitude of relative *de facto* differences between U.S. GAAP and IFRS income and conduct our tests using the one-third of firms with the largest *de facto* differences between U.S. GAAP and IFRS income at first-time IFRS adoption. We report the results for β_7 , our main variable of interest (the difference-in-differences), for sample splits other than the one-third of firms with the largest *de facto* differences in Table 14. Using the 50%, 40%, 33%, 30% and 20% of firms with the largest *de facto* differences between U.S. GAAP and IFRS income at first-time IFRS adoption, results are consistent with earnings informativeness differences varying with the magnitude of *de facto* reconciliation differences.

**Table 14: Multivariate earnings informativeness results –
subsample analysis with different sample splits**

Difference in pre/post adoption differences				
Sample split	Coefficient β_7		z	P> z
Median	-0.08		-0.05	0.96
upper 40 percent	5.58 **		2.07	0.04
upper 33 percent	7.08 ***		3.35	0.00
upper 30 percent	7.73 ***		3.43	0.00
upper 20 percent	12.61 ***		4.08	0.00

The table presents the difference in the longitudinal changes in ERCs of the transition group and the control group which is captured by coefficient β_7 . β_7 is obtained from regressions of 12 months returns on earnings of a group of firms that switch from U.S. GAAP to IFRS and a group of firms that constantly follow IFRS. For the regressions we use the 50%, 40%, 33%, 30% and 20% of firms with the largest de-facto differences between U.S. GAAP and IFRS income at first-time IFRS adoption.

*, ** and *** indicate significance levels less than 10%, 5% and 1%, respectively.

2.6. Conclusion

This paper is the first to provide direct evidence on the effect of an accounting regime switch from U.S. GAAP to IFRS on financial reporting properties. Specifically, we document that earnings informativeness changes when firms transition from U.S. GAAP to IFRS. We exploit a unique setting in which a sample of 108 German firms using U.S. GAAP adopts IFRS. By using a matched sample of firms that prepare their financial statements according to IFRS in all analyzed periods, we control for changes in earnings informativeness attributable to factors other than a change in accounting standards.

In this difference-in-differences setting, we find increased earnings informativeness for firms with larger relative *de facto* differences between U.S. GAAP and IFRS income after transitioning from U.S. GAAP to IFRS, whereas

First, when analyzing all sample firms, we find no significant change of earnings informativeness for firms transitioning from U.S. GAAP to IFRS. Our results indicate that a change in the accounting standard system does not have an effect on earnings informativeness for all firms transitioning from U.S. GAAP to IFRS. However, the impact of changing accounting standards might differ between firms, depending on their individual business transactions and differences in the accounting for these transactions between U.S. GAAP and IFRS. Also, firms might use discretion to maintain to the greatest possible extent the accounting practices previously applied under U.S. GAAP and thus limit *de facto* differences. Hence, second, we investigate a subsample of firms with the largest relative *de facto* differences between U.S. GAAP and IFRS incomes. We test if earnings informativeness changes for firms with larger relative *de facto* differences between U.S. GAAP and IFRS incomes after transition from U.S. GAAP to IFRS. In contrast, we fail to find a significant average effect for the full sample. These results are consistent with IFRS adoption impacting financial reporting properties, but only where firms are materially affected by the differences between the two sets of reporting standards.

This finding contributes to the debate regarding possible effects of a transition from U.S. GAAP to IFRS in the U.S., where IFRS adoption is currently considered. However, we caution that our results may not generalize to all transitions from U.S. GAAP to IFRS. We are aware of our relatively small sample size and a possible corresponding lack of statistical power. However, compared to prior studies that investigate attribute differences between U.S. GAAP and IFRS using even smaller samples, we use a difference-in-differences approach to alleviate concerns of a distortion in our

results due to changing reporting incentives and adopt a two-stage regression model to alleviate concerns of possible selection bias. To the best of our knowledge, we are the first to study an actual transition from U.S. GAAP to IFRS. The pre- and post-IFRS adoption comparison of identical firms further alleviates concerns of a distortion induced by different firm characteristics that might otherwise occur in a comparison of different firms using different sets of accounting standards.

We also note that the transition from IFRS to U.S. GAAP might have different effects on firms earnings attributes in a different institutional environment. However, as to our knowledge Germany was the only country that permitted optional application of U.S. GAAP and IFRS and then required mandatory adoption of IFRS, we are currently unable to investigate the effect of a transition in a different institutional setting. This issue can be subject to future research if companies in the U.S. might commence transitioning from U.S. GAAP to IFRS.

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3. Comparability between financial statements prepared under U.S. GAAP and IFRS

3.1. Introduction

The present study investigates if comparability between financial statements of firms that transition from U.S. GAAP to IFRS and financial statements of firms that constantly follow IFRS increases when both groups of firms follow IFRS. With the regulation for mandatory adoption of IFRS in 2005 the European Commission intended to enhance comparability of financial statements of public traded firms (EC (2002)). Also the U.S. Securities and Exchange Commission (SEC) currently considers mandatory adoption of IFRS in the United States (SEC (2010)). The SEC supports the idea of a single set of global accounting standards to enhance the ability of investors comparing financial information of non-US firms and US firms (SEC (2008)). However, no study has yet investigated if firms switching from U.S. GAAP to IFRS become more comparable to firms that constantly apply IFRS. IFRS are perceived to be more principles based relative to U.S. GAAP (Barth (2008)) and more principles based accounting standards provide more discretion for earnings management (Ewert and Wagenhofer (2005)). Thus increased discretion under IFRS can affect comparability and as firms that apply IFRS become more flexible comparability might even decrease after adoption of IFRS (Barth et al. (2011)). This brings some tension into the argument that adoption of IFRS will increase comparability between firms and demonstrates the necessity for an empirical investigation.

We exploit the unique setting of Germany, where public listed firms were permitted to optionally apply U.S. GAAP or IFRS until mandatory

adoption of IFRS in the European Union in 2005 (EC (2002)).¹ We investigate comparability between 108 German firms that transition from U.S. GAAP to IFRS between 2003 and 2008 and a group of matched German firms that constantly apply IFRS. The firms are compared two years before the transitioning firms adopt IFRS and two years after IFRS adoption.

Our definition of comparability follows the definition of De Franco et al. (2011) et al.. Financial statements are regarded as comparable, if a given set of economic events is represented similarly in accounting outcomes and different economic events are represented differently in accounting outcomes.

We assess comparability between the transitioning and control firms using three accounting comparability measures developed by Barth et al. (2011) that are based on a measure developed by De Franco et al. (2011). Barth et al. (2011) map the economic outcomes stock prices, returns and cash flows to given accounting amounts of firms that follow different sets of accounting standards. The mapping of economic outcomes to accounting amounts is conducted in three major steps. First, functions between observed economic outcomes and accounting amounts are derived for different sets of accounting standards. Second, fitted economic outcomes are estimated by multiplying the accounting amounts of individual firms with the derived functions between observed economic outcomes and accounting amounts. Thus, for each set of accounting standards separate economic outcomes are estimated that would be expected given firms' accounting amounts. Third, the smaller the difference in fitted economic outcomes of each firm, the higher the comparability between two sets of accounting standards.

¹ Firms that applied US GAAP before 2005 were permitted to defer transition to IFRS until the end of 2007. Two out of the transition firms have a fiscal year end different than December 31st and hence transition to IFRS in 2008.

In addition to the comparability tests we provide extensive index-based analyses on income and book value of equity reconciliations from U.S. GAAP to IFRS that have to be prepared in accordance with IFRS 1 at the time point of adoption of IFRS. We use a comparability index that is based on Gray (1980) to compare the absolute differences between U.S. GAAP and IFRS income and book value of equity. In addition, reconciliation items are categorized and we compare the reconciliation categories separately using the same index. IFRS 1 requires retrospective application of all IFRS at first-time IFRS adoption with some optional exemptions. We analyze how these IFRS 1 exemptions are used by the transitioning firms and relate them to overall differences between book values of equity, incomes and reconciliation item categories.

In summary we find an increase in comparability after firms transitioned from U.S. GAAP to IFRS. Two out of three comparability measures developed by Barth et al. (2011) suggest that comparability to firms constantly following IFRS improves after transitioning firms adopt IFRS. However, one comparability measure, the differences in fitted stock prices, indicates a lower comparability in post-transition periods.

We offer the following explanation for the deviating result; fitted stock prices are mainly dependent on book value of equity, hence the results are indicating that firms are less comparable in terms of book value of equity in post-adoption periods. We analyze if this is an effect due to differences between U.S. GAAP and IFRS standards or a transition effect. We find first indications in our descriptive analysis of reconciliations from U.S. GAAP to IFRS. It shows that firms exercising exemptions of IFRS 1 or the covert option for capitalization of intangible assets provided by IAS 38 more frequently report differences in book value of equity prepared under U.S. GAAP and

IFRS than other firms in our sample. For these firms also the magnitude of differences in book value of equity prepared under U.S. GAAP and IFRS is larger compared to the other firms in our sample.

Hence, we test if the use of the exemptions of IFRS 1 and the covert option for the capitalization of intangible assets induce transition effects that have a negative impact on measures of comparability that are mainly dependent on book value of equity. We partition our sample and repeat our multivariate comparability tests with a subsample of firms that use IFRS 1 exemptions and a subsample of firms that do not use IFRS 1 exemptions.

Measures of comparability that are mainly dependent on book value of equity indicate a significantly lower comparability in post-adoption periods for firms that use IFRS 1 exemptions or the covert option for the capitalization of intangible assets. We find that measures of comparability that are mainly dependent on book value of equity are not impacted in post-adoption periods for firms that do not use IFRS 1 exemptions or the covert option for the capitalization of intangible assets.

Our study contributes to prior studies as until today effects on comparability between firms that transition from U.S. GAAP to IFRS and firms that constantly follow IFRS have not been analyzed. Comparing firms from a single country that use different sets of accounting standards, we abstract from effects on comparability induced by institutional differences across countries. The study contributes to the debate about IFRS adoption in the United States and is of relevance for the SEC that emphasizes increased comparability between US and non-US firms as being a major objective in the current considerations on IFRS adoption in the United States (SEC (2008)).

In addition, the European Commission promulgated adoption of IFRS in the European Union with the objective to enhance comparability between financial statements (EC (2002)). This study assesses if this objective has been achieved for firms that adopted U.S. GAAP before mandatory adoption of IFRS in the EU.

Our study is also relevant for the ongoing convergence process between the IASB and the FASB. It shows if and how differences between U.S. GAAP and IFRS affect comparability between financial statements, potentially indicating a necessity of future convergence efforts.

This paper is organized as follows: In section 2 we describe the German setting and provide some background on the convergence process between IASB and FASB and the possible IFRS adoption in the US. After a brief literature overview the section concludes with the hypotheses development. Section 3 provides descriptive statistics on income and book value of equity reconciliations and describes our research design and the sample. We present our empirical results in section 4 and alternative analyses in section 5. Section 6 concludes.

3.2. Background and hypotheses

3.2.1. The German setting

Germany permitted voluntary adoption of U.S. GAAP or IFRS before adoption of IFRS was required by the European Commission from 2005 onwards (EC (2002)). The regulation prescribing mandatory adoption of IFRS in 2005 included an exemption for firms that adopted U.S. GAAP before 2005. These firms had permission to defer application of IFRS until the end of 2007 (EC (2002)). As presented in Table 1, 108 firms in Germany adopted U.S.

GAAP between 1995 and 2003 and transitioned to IFRS between 2003 and 2008.²

The setting of Germany has several advantages. First, as we analyze two groups of firms that either follow U.S. GAAP or IFRS but are located in a single country, we hold institutional factors constant that could otherwise vary in a cross-country comparison. Second, as firms transition from U.S. GAAP to IFRS we analyze them in pre- and post-IFRS adoption periods, using them as their own control. Third, we use a control group of firms that constantly follow IFRS to control for changes in the institutional environment during the analyzed periods. Potentially distorting effects from changes in the institutional environment are further mitigated as the transitioning firms switch to IFRS in different years; consequently the periods analyzed vary across firms. Fourth, we conduct our study with data obtained from firms transitioning from one set of accounting standards to another which can make a difference to data obtained from reconciliations from one set of accounting standards to another. Some firms reconcile their accounting data from one set of accounting standards to another on a voluntary basis or because they are obliged e.g. due to a listing on a foreign exchange. However, firms reconciling their accounting data might use inherent discretion in accounting systems to report financial data prepared under two sets of accounting standards that is more consistent. Hence, reported differences between financial statements prepared under the different sets of accounting standards are limited. Fifth, the transition to IFRS is mandatory, eliminating a potential self-selection bias.

² In this paper we refer to this group of firms as transition group.

Table 1: German IFRS and U.S. GAAP adopters and U.S. GAAP to IFRS transitions

Year	IFRS adopter			U.S. GAAP adopter			U.S. GAAP to IFRS transitions		
	Frequency	Percent	Cumulative	Frequency	Percent	Cumulative	Frequency	Percent	Cumulative
1995	-	-	-	2	1.85	1.85	-	-	-
1996	1	0.15	0.15	0	0	1.85	-	-	-
1997	4	0.62	0.77	8	7.41	9.26	-	-	-
1998	1	0.15	0.93	5	4.63	13.89	-	-	-
1999	5	0.77	1.70	18	16.67	30.56	-	-	-
2000	14	2.17	3.87	41	37.96	68.52	-	-	-
2001	22	3.41	7.28	13	12.04	80.56	-	-	-
2002	66	10.22	17.49	19	17.59	98.15	-	-	-
2003	101	15.63	33.13	2	1.85	100	6	5.56	5.56
2004	123	19.04	52.17	-	-	-	23	21.30	26.85
2005	212	32.82	84.98	-	-	-	60	55.56	82.41
2006	69	10.68	95.67	-	-	-	13	12.04	94.44
2007	28	4.33	100	-	-	-	4	3.70	98.15
2008	-	-	-	-	-	-	2	1.85	100
Total	646	100		108	100		108	100	

This table presents descriptive statistics on the time point of adoption of an international accounting system by German firms. The first column shows the year of adoption. The second column labeled “IFRS adopter” presents the number of German firms adopting IFRS in a particular year. The third column labeled “U.S. GAAP adopter” presents the number of German U.S. GAAP adopter in a particular year. The fourth column labeled “U.S. GAAP to IFRS transitions” presents the number of German firms that transition from U.S. GAAP to IFRS. We use the variable “accounting system followed” from the Datastream database (07536) to derive the presented data. The table includes all IFRS adopter that adopted IFRS before the year 2008. All firms that adopt IFRS in later years cannot be used as control firms in our analyses as they cannot be observed over a sufficient period of time.

3.2.2. Convergence process and IFRS adoption in the United States

Since 2002 the standard setters IASB and FASB are committed to remove divergence between their accounting systems IFRS and U.S. GAAP. The “Norwalk Agreement” was the commencement of the convergence process between the IASB and FASB with its long term strategic goal of a common set of high quality global standards (FASB and IASB (2002)).

One result of the convergence efforts is that foreign private issuers following IFRS that are listed on a US stock exchange are not required anymore by the SEC to reconcile their financial statements to U.S. GAAP since November 2007. In the final rule abandoning the reconciliations to U.S. GAAP, the SEC states that “...*by encouraging the use of IFRS as issued by the IASB, these amendments will help investors to understand international investment opportunities more clearly and with greater comparability in the long term than if they had to continue to rely on a multiplicity of national accounting standards*” (SEC (2007)). It is again referred to the comparability between financial information provided in U.S. GAAP and IFRS financial statements in the SEC Roadmap that proposes mandatory adoption of IFRS by US issuers.

The acceptance of financial statements from foreign issuers in 2007 fueled the debate about potential adoption of IFRS in the US (e.g. Cheng (2009)). In 2008 the SEC published a roadmap proposing mandatory adoption of IFRS for all US issuers. The SEC first aimed to make a final decision about mandatory adoption in 2011 that is already delayed. No other deadline for a final decision has been announced yet. In the roadmap the SEC states that “...*U.S. investors would benefit from enhanced ability to compare financial information of U.S companies. The Commission has long expressed its support*

for a single set of high-quality global accounting standards as an important means of enhancing comparability. [...] IFRS has the potential to best provide the common platform on which companies can report and investors can compare financial information.” (SEC (2008)).

The statements of the SEC raise the question whether comparability between firms transitioning from U.S. GAAP to IFRS and firms constantly applying IFRS changes after adoption of IFRS. The effect of a transition from U.S. GAAP to IFRS on changes in comparability to firms that follow IFRS has yet not been analyzed. Comparability is also dependent on the flexibility of standards or the regulatory environment (Barth et al. (2011)). As IFRS are perceived to be more principles based (Barth (2008)) more discretion is provided to managers to conduct earnings management (Ewert and Wagenhofer (2005)). Comparability might even decrease after adoption of IFRS as a consequence of an increased flexibility of accounting standards. While other factors as e.g. differences or changes in the regulatory environment can also affect comparability, our setting allows to isolate these factors and to focus on the effect of accounting standards on accounting comparability.

3.2.3. Related literature

Our analysis builds upon two strings of literature. First, literature assessing IFRS adoption and differences between and corresponding effects of financial statements prepared under U.S. GAAP or IFRS. Second, literature on determinants and consequences of accounting comparability.

We add to the IFRS adoption literature that assesses effects of IFRS adoption on financial reporting properties and economic consequences. The

voluntary IFRS adoption literature is review by Soderstrom and Sun (2007) and literature on mandatory IFRS adoption with its intended and unintended consequences is review by Brüggemann et al. (2012). Both studies are reviewing papers mainly focusing on EU settings and transitions from domestic GAAP to IFRS. However, to the best of our knowledge there is no study investigating transitions from U.S. GAAP to IFRS. Several studies assess effects of differences between U.S. GAAP and IFRS on financial reporting properties or capital market consequences, often using data from 20-F reconciliations. 20-F reconciliations were required from foreign private issuers listed on a US stock exchange that had to reconcile their book value of equity and income prepared under domestic GAAP to financial data prepared under U.S. GAAP. Foreign issuers following IFRS had to reconcile their financial data until the end of 2007 (SEC (2007)). Based on this prior studies test the market valuation of IAS versus U.S. GAAP accounting data (Harris and Muller (1999); Henry et al. (2009)), however with rather inconclusive results. Other studies exploit the German setting where some firms adopted U.S. GAAP or IFRS in their consolidated financial statements before mandatory adoption of IFRS in the EU. The studies compare financial reporting properties (Bartov et al. (2005); Van der Meulen et al. (2007)) or information asymmetry (Leuz (2003)) across different groups of firms following either U.S. GAAP or IFRS. Our study further differs from the prior studies investigating differences between U.S. GAAP and IFRS as we focus on changes in accounting comparability upon transitions from U.S. GAAP to IFRS instead of differences in value relevance, earnings attributes or information asymmetry across groups of firms applying either U.S. GAAP or IFRS. An analysis of transitions has the

advantage that the firms report first under U.S. GAAP and then under IFRS and thus can be used as their own control.

Many studies assessing comparability between U.S. GAAP and IFRS use index-based research methodologies (Blanco and Osma (2004); Haverty (2006); Plumlee and Plumlee (2008); Street et al. (2000)). Most of the studies compare income and book value of equity collected from IFRS to U.S. GAAP income and book value of equity reconciliations using a comparability index introduced by Gray (1980). The index relates the overall income (book value of equity) reconciliations to the absolute amount of U.S. GAAP income (book value of equity). We also use this index in our descriptive analysis of reconciliations that have to be prepared according to IFRS 1 when firms adopt IFRS for the first time. In line with prior studies (Blanco and Osma (2004); Plumlee and Plumlee (2008); Street et al. (2000)) we also categorize reconciliation items and apply the comparability index to reconciliation items separately. All prior index-based comparability studies differ from our index-based analysis of U.S. GAAP to IFRS reconciliations, as they investigate 20-F reconciliations from non-US companies listed in the US rather than reconciliations prepared in the transition process from U.S. GAAP to IFRS. Firms that reconcile their accounting data from one set of accounting standards to another might use discretion inherited in accounting standards to make financial statement more consistent. This concern is mitigated if a transition from one set of accounting standards to another is analyzed.

Comparability is a concept that has not been defined very precisely in prior literature (De Franco et al. (2011)). Recent studies (Barth et al. (2011); De Franco et al. (2011)) grasp comparability between financial statements in differences between fitted economic outcomes calculated with functions that

are applied on individual firms' accounting amounts. The functions are derived from regressions of economic outcomes on accounting amounts of groups of firms that apply different sets of accounting standards. This mapping of economic outcomes into accounting amounts is derived from the definition of comparability that firms which experience the same economic events are comparable if they produce the same accounting outcomes (De Franco et al. (2011)). The study of Barth et al. (2011) investigates whether non-US firms that transition from domestic standards to IFRS become more comparable to US-firms applying U.S. GAAP. Our study builds on Barth et al. (2011) and is the first to investigate changes in comparability between firms that first apply U.S. GAAP and then transition to IFRS and firms constantly applying IFRS. We hence contribute to the current debate about potential IFRS adoption in the US (SEC (2008)).

We add to a growing body of literature investigating the determinants and consequences of accounting comparability. Alternative direct measures of accounting comparability, aside from index-based measures, focus on accrual-cash flow relations (Beuselinck et al. (2007); Bradshaw and Miller (2008)), variances of balance-sheet items or earnings properties (Cascino and Gassen (2010)) as well as valuation models (Liao et al. (2011)).

Other studies focus on consequences of accounting comparability. Sohn (2011) uses the measure developed by De Franco et al. (2011) to investigate consequences of increased comparability on earnings management activities. He finds a shift from accrual-based to real earnings management when accounting comparability increases. Brochet et al. (2011) investigate if private information benefits change when accounting comparability increases. They find a negative association between accounting comparability and private

information advantages. Wu and Zhang (2010) find that accounting information from foreign benchmarks is more frequently used for relative performance evaluations if accounting comparability improves. Similar to Brochet et al. (2011) and Wu and Zhang (2010), Wang (2011) investigates changes in the information environment of firms when accounting comparability increases. Wang (2011) finds a positive association between transnational information transfers and accounting comparability between different countries. Other studies as DeFond et al. (2011) investigate macroeconomic consequences of changes in accounting comparability. DeFond et al. (2011) find a positive relation between foreign mutual fund ownership and increased accounting comparability. The studies analyzing consequences of changes in accounting comparability often exploit settings where harmonization of accounting standards increases and focus on mandatory IFRS adoption (e.g. Brochet et al. (2011), DeFond et al. (2011), Wu and Zhang (2010)). The underlying assumption is that harmonized accounting standards improve comparability of accounting outcomes. In this study we are not directly interested in the consequences of changes in accounting comparability but contribute to the body of literature analyzing if comparability of accounting outcomes improves if more harmonized accounting standards are applied. More specifically if IFRS are commonly applied instead of a parallel use of U.S. GAAP and IFRS.

3.2.4. Regulations on first time IFRS adoption under IFRS 1

IFRS 1 regulates the first-time adoption of IFRS and requires retrospective application of all IFRS at first time adoption with some exemptions. According to the standard, a firms' first IFRS financial statements

have to include a reconciliation of book value of equity reported under previous standards to book value of equity reported under IFRS. Additionally, a reconciliation of other comprehensive income reported under previous standards to other comprehensive income reported under IFRS has to be prepared. The standard does not prescribe a certain structure for the reconciliations of equity and other comprehensive income but requires “*sufficient detail to enable users to understand the material adjustments to the statement of financial position and statement of comprehensive income*”³. Consequently, reconciliations are very heterogeneous among firms and reconciliation items often refer to accounting topics (as e.g. “intangibles”) rather than to specific standards (as e.g. “IAS 38”).

The exemptions from retrospective application of some IFRS are optional and exist to facilitate the transition to IFRS. In the following we only concentrate on those exemptions that were exercised by the transitioning firms included in our sample. Adjustments to financial statements that arise from the use of exemptions included in IFRS 1 are recognized directly in equity.⁴ Firms have to disclose which exemptions from retrospective application of IFRS are used, however disclosures are often not transparent or too insufficient to exactly quantify effects of exemptions on book value of equity and income.

According to IFRS 1 firms under certain conditions can choose not to apply retrospectively IFRS 2 in accounting for share-based payment transactions and IFRS 3 in accounting for business combinations. Items of property, plant and equipment, investment property and intangible assets can be measured at fair value at the date of transition and fair value can be used as

³ IFRS 1.25.

⁴ IFRS 1.11.

deemed cost at that date with recognition of adjustments directly in equity.⁵ Regarding the accounting for employee benefits under IAS 19 all cumulative actuarial gains and losses can be recognized in equity at the date of transition.⁶ Also foreign currency translation differences according to IAS 21 that were recognized in other comprehensive income and accumulated in a separate component of equity can be reclassified to retained earnings. Except for the currency translation differences, all these exemptions can change the amount of equity at the time point of transition from U.S. GAAP to IFRS.⁷ Currency translation differences rather induce a reclassification within equity than a change in the amount of equity. In addition to the exemptions included in IFRS 1 we consider the capitalization of self-generated intangible assets according to IAS 38 as a covert option (Nobes (2006)) that can be exercised at the time point of first time adoption of IFRS and that has an influence on the amount of equity. Firms can exploit discretion contained in the criteria of IAS 38 for the capitalization of development costs incurred in the transition and previous periods to actively manage the amount of their book value of equity.

3.2.5. Hypotheses development

Comparability between financial statements is affected if an economic event is reflected differently in financial statements of two similar firms (De Franco et al. (2011)). The IASB and FASB are committed to alleviate differences in their accounting systems. However, many differences in the two

⁵ IFRS 1.30.

⁶ IFRS 1.D10-D11.

⁷ All IFRS 1 exemptions that change the amount of equity can also have effects on the amount of income e.g. due to changing depreciation/amortization amounts or the amount of actuarial gains and losses recognized in the income statement in following fiscal periods. However, these effects do not necessarily have to occur in the periods directly following the transition period and are less material than effects on book value of equity as they are scattered over several periods.

sets of accounting standards have yet not been part of the active agenda of the convergence projects between IASB and FASB. Open topics comprise the accounting of intangibles, impairments, provisions and contingent liabilities. Other topics that are part of the active convergence agenda but still uncompleted comprise the accounting treatment of leases, the recognition of revenues, the distinction between liabilities and equity and the financial statement presentation. In spite of these uncompleted topics lots of similarities exist between the two accounting systems, so that a transition from U.S. GAAP to IFRS might not even affect accounting comparability. Increased flexibility of IFRS accounting standards (Ewert and Wagenhofer (2005)) might even decrease comparability after transition to IFRS. It is not clarified if the elimination of existing differences between U.S. GAAP and IFRS upon a transition to IFRS outweighs these effects and leads to an improvement of comparability in accounting outcomes. As for example it is claimed in prior literature that a single set of accounting standards would enhance comparability (e.g. Barth (2008)). We aim to shed light on the effects of U.S. GAAP to IFRS transitions on comparability of accounting amounts and test the following hypothesis:

H₁ Adoption of IFRS affects the degree of comparability of a group of U.S. GAAP firms' financial statements with those of a control group of IFRS firms.

The covert option for self-generated intangible assets and the IFRS 1 exemptions induce transition effects that are recognized directly in equity. This results in a deviating reflection of economic events in book value of equity. Hence we expect book value of equity of firms that transition from U.S. GAAP to IFRS and that make use of the exemptions in IFRS 1 and the covert option

for intangibles to be less comparable to firms that constantly follow IFRS. Consequently, measures which are mainly dependent on book value of equity are likely to indicate a lower comparability after adoption of IFRS.

H₂ If transitioning firms use IFRS 1 exemptions or the covert option for capitalization of intangible assets, measures of comparability that are mainly influenced by book value of equity indicate a lower comparability to firms constantly following IFRS in post-adoption periods.

3.3. Research design, descriptive statistics and sample

3.3.1. Index-based analysis of income and book value of equity reconciliations

3.3.1.1. *Design index-based analysis*

We conduct an index-based analysis for the following reasons: first, to get an insight into the magnitude of differences in book value of equity and income prepared under U.S. GAAP and IFRS. Second, further analyses of the book value of equity and income reconciliations shed light on the items that are the main drivers of differences in accounting outcomes prepared under U.S. GAAP and IFRS. If our statistical analysis shows that comparability is affected by a transition from U.S. GAAP to IFRS, effects are likely to be caused by elimination of differences between these items. Third, the descriptive statistics provide an overview how IFRS 1 exemptions and the covert option for capitalization of intangible assets are used. And fourth, we separate the firms into a group that uses the IFRS 1 exemptions and the covert option for capitalization of intangible assets and a group that does not make use of them. This gives information about whether the frequency and magnitude of differences in book value of equity and income prepared under U.S. GAAP and

IFRS is larger for firms that use IFRS 1 exemptions and the covert option for capitalization of intangible assets. This is directly related to the test of our second hypothesis as we expect that transition effects induced by the use of IFRS 1 exemptions and the covert option for capitalization of intangible assets especially affect book value of equity.

Our index-based analysis of financial statements prepared under U.S. GAAP and IFRS is based upon reconciliation requirements prescribed in IFRS 1. We hand-collect all reconciling items between U.S. GAAP and IFRS book value of equity and other comprehensive income and group all reconciliation items into 12 categories which is, due to the large heterogeneity of reconciliations among firms and aggregated presentation of many reconciliation items, the greatest detail possible. All reconciliation items that cannot be allocated into one out of the 12 categories, e.g. as they combine two different groups of our reconciliation categories, are assigned to a category denoted as “other”. An additional category denoted as “tax” captures deferred tax adjustments that are a consequence of prior adjustments to equity and other comprehensive income.

To compare the reconciling items and differences in income and book value of equity between firms, we adapt a comparability index that is based on Gray (1980) and has been used in several prior studies (e.g. Adams et al. (1999); Blanco and Osma (2004); Haverty (2006); Street et al. (2000); Weetman et al. (1998)). The comparability index for the comparison of incomes is computed as follows:

$$\text{Income comparability index} = - \left(\frac{NI_{US} - NI_{IFRS}}{|NI_{US}|} \right)$$

where:

NI_{US} Income prepared in the firms' last reporting period under U.S. GAAP.

NI_{IFRS} Reconciled income in accordance with IFRS in the firms' last reporting period under U.S. GAAP.

We compute a similar comparability index comparing equity prepared under U.S. GAAP and IFRS at the time point of transition to IFRS. It is computed as follows:

$$\text{Equity comparability index} = - \left(\frac{BV_{US} - BV_{IFRS}}{|BV_{US}|} \right)$$

where:

BV_{US} Book value of equity prepared under U.S. GAAP at the end of the firms' last reporting period under U.S. GAAP.

BV_{IFRS} Reconciled book value of equity prepared in accordance with IFRS at the end of the firms' last reporting period under U.S. GAAP.

The indices compute income and equity differences between U.S. GAAP and IFRS relative to the absolute amount of U.S. GAAP income and book value of equity. Thus we derive the percentage change of IFRS income and book value of equity relative to the absolute amount of U.S. GAAP income and book value of equity.

In addition to the indices comparing differences in incomes and book value of equity, we compute an index comparing our reconciliation item categories. The index is computed for income and equity reconciliation categories as follows:

$$\text{Income reconciliation category comparability index} = \left(\frac{\text{Income reconciliation category}}{|NI_{US}|} \right)$$

$$\text{Equity reconciliation category comparability index} = \left(\frac{\text{Equity reconciliation category}}{|BV_{US}|} \right)$$

The index shows the percentage change induced by a reconciliation category relative to U.S. GAAP income or book value of equity.

In addition to the reconciliation items we hand-collect all IFRS 1 exemptions that were exercised in the transition process to IFRS and data on the covert option included in IAS 38 for the capitalization of self-generated intangible assets.

3.3.1.2. *Results index-based analysis*

Table 2 shows all IFRS 1 exemptions that are used with different frequencies by 90 out of the 108 transitioning firms with available data.⁸ The IFRS 1 exemptions for pensions (30) and business combinations (23) and the covert option for intangibles (20) are the most commonly used. Table 3 provides an overview of how extensively the exemptions with an effect on the amount of equity are used on the individual firm level by 90 out of the 108 transitioning firms with available data. Most firms use one (25.56%) or two (23.33%) IFRS 1 exemptions and more than 45% of all firms do not use any IFRS 1 exemption. As we focus on those exemptions that can change the amount of equity we assign firms that only use the IFRS 1 exemption for translation differences to the firms that do not use IFRS 1 exemptions and denote this group as non-users of IFRS 1 exemptions in the following.

⁸ If we speak of IFRS 1 exemptions in the following, the covert option for the capitalization of self-generated intangible assets is included in this general term, although it is not regulated by IFRS 1 but IAS 38.

Table 2: IFRS 1 exemptions exercised

	Frequency	Percent
Business combinations	23	25.56
Share based payments	4	4.44
Pensions	30	33.33
Currency translations	11	12.22
Deemed costs	3	3.33
Intangibles	20	22.22

The table presents descriptive statistics on IFRS 1 exemptions exercised and firms that use the covert option for the capitalization of intangible assets in the transition process from U.S. GAAP to IFRS. We find available data for 90 out of 108 transitioning firms.

Table 3: Number of IFRS 1 exemptions exercised per firm

Number of exemptions exercised	Frequency	Percentage	Cumulative
0	41	45.56	45.56
1	23	25.56	71.11
2	21	23.33	94.44
3	5	5.56	100

The table presents descriptive statistics on the number of IFRS 1 exemptions and covert option for the capitalization of intangible assets each firm exercised in the transition process from U.S. GAAP to IFRS. We only consider exemptions with an effect on equity and consequently exclude the exemption for currency translation differences. We find available data for 90 out of 108 transitioning firms.

We report descriptive statistics on the overall percentage income and book value of equity differences in Table 4. Out of our sample of 108 transitioning firms we analyze 89 available income reconciliations and 90 available book value of equity reconciliations. On average income prepared under IFRS is smaller than income prepared under U.S. GAAP (mean index: -0.46) which is consistent with Haverty (2006) but contrary to Blanco and Osma (2004) and Street et al. (2000). However, a t-test of the mean and Wilcoxon sign-rank test of the median remain statistically insignificant. Reported equity

is on average slightly larger (mean index: 0.04) under IFRS than under U.S. GAAP but again mean and median are statistically insignificant. This result is again contrary to the findings of Blanco and Osma (2004), the only index-based comparability study reporting results on equity reconciliations between U.S. GAAP and IFRS. Reasons for the inconclusive results and mixed findings of prior studies might be the small sample size, the differences in settings as prior studies obtain data from 20-F reconciliations and that U.S. GAAP and IFRS are already very similar and consequently cause limited effects on financial statements without a distinct direction.

Table 4: Relative income and equity differences

	Frequency	Mean	Standard deviation	Min	0.25	Median	0.75	Max
Relative income differences	89	-0.46	5.23	-49.00	-0.03	0.00	0.04	3.81
Relative equity differences	90	0.04	0.37	-1.03	0.00	0.00	0.02	3.33

The table presents descriptive statistics on percentage differences in income and book value of equity that are scaled by the absolute amount of U.S. GAAP income and U.S. GAAP book value of equity. U.S. GAAP and IFRS income and book value of equity are hand collected from reconciliations prepared according to IFRS 1 at first time adoption of IFRS.

Table 5: Percentage distribution income comparability index

Index	Overall			User of exemptions			No users of exemptions		
	Frequency	Percentage	Cumulative	Frequency	Percentage	Cumulative	Frequency	Percentage	Cumulative
> 10%	15	16.85	16.85	9	18.37	18.37	6	15.00	15.00
10% < > 5%	5	5.62	22.47	2	4.08	22.45	3	7.50	22.50
5% < > 0%	19	21.35	43.82	10	20.41	42.86	9	22.50	45.00
= 0%	16	17.98	61.80	4	8.16	51.02	12	30.00	75.00
0% < > -5%	15	16.85	78.65	10	20.41	71.43	5	12.50	87.50
-5% < > -10%	8	8.99	87.64	7	14.29	85.71	1	2.50	90.00
< -10%	11	12.36	100	7	14.29	100	4	100	100
	89	100		49	100		40	100	

The table shows the percentage of income differences between U.S. GAAP and IFRS incomes relative to the absolute amount of U.S. GAAP incomes. It distinguishes between the full sample of 108 companies of which 89 have available data and two subsamples. One subsample comprises all firms that use at least one exemption of IFRS 1 or the covert option for the capitalization of intangibles and another subsample of firms that do not use any exemption or the covert option for the capitalization of intangibles.

Table 5 presents the percentage distribution of the income comparability index. We report the percentage distribution for the full sample and separately for firms that exercise IFRS 1 exemptions and firms that do not make use of the exemptions. For the full sample the table shows that a majority of 43.82 % of the analyzed firms report a larger IFRS income than U.S. GAAP income. 17.98 % of the firms report an IFRS income equal to U.S. GAAP income. 38.20 % of the analyzed firms report a lower income under IFRS. Few users of IFRS 1 exemptions have no effects on income (8.16%) compared to the non-users of IFRS 1 exemptions (30.00%). However, the descriptive analysis indicates that the use of IFRS 1 exemptions affects incomes to a limited extent as the frequency of extreme deviations from U.S. GAAP income increases only slightly compared to non-users of IFRS 1 exemptions. 51.03% of the firms that use IFRS 1 exemptions have a change in income larger than 5% compared to 35.00% percent of the non-users of IFRS 1 exemptions.

The percentage distribution of the equity comparability index is shown in Table 6. For the entire sample 47.78% of the firms report a larger book value of equity under IFRS than under U.S. GAAP. Reported book value of equity is equal for 23.33% of the analyzed firms. 28.88% of the analyzed firms report a lower book value of equity under IFRS. When we distinguish our sample between users and non-users of IFRS 1 exemptions the differences in book value of equity prepared under U.S. GAAP and IFRS are more frequent for users of IFRS 1 exemptions. Only 6.12% of users of IFRS 1 exemptions have no changes in the amount of equity compared to 43.90% of the non-users of IFRS 1 exemptions. Also the magnitude of changes in book value of equity increases as changes that are larger than 5% relative to U.S. GAAP equity are

more frequent for users of IFRS 1 exemptions (32.64%) compared to non-users of IFRS 1 exemptions (14.64%).

Overall, the descriptive statistics indicate that IFRS increases income and book value of equity compared to U.S. GAAP for most of the firms. The results also indicate that the use of IFRS 1 exemptions affects both, equity and income but with more pronounced effects on equity, as expected. The latter finding is a first indication that transition effects especially have an impact on book value of equity. This is related to the test of our second hypothesis, as we expect these effects to have a negative impact on measures of comparability that are dependent on book value of equity.

Table 6: Percentage distribution equity comparability index

Index	Overall			User of exemptions			No users of exemptions		
	Frequency	Percentage	Cumulative	Frequency	Percentage	Cumulative	Frequency	Percentage	Cumulative
> 10%	7	7.78	7.78	4	8.16	8.16	3	7.32	7.32
10% < > 5%	8	8.89	16.67	5	10.20	18.37	3	7.32	14.63
5% < > 0%	28	31.11	47.78	17	34.69	53.06	11	26.83	41.46
= 0%	21	23.33	71.11	3	6.12	59.18	18	43.90	85.37
0% < > -5%	19	21.11	92.22	13	26.53	85.71	6	14.63	100
-5% < > -10%	4	4.44	96.67	4	8.16	93.88	0	0.00	100
< -10%	3	3.33	100	3	6.12	100	0	0.00	100
	90	100		49	100		41	100	

The table shows the percentage of book value of equity differences between U.S. GAAP and IFRS book value of equity relative to the absolute amount of U.S. GAAP book value of equity. It distinguishes between the full sample of 108 companies of which 90 have available data and two subsamples. One subsample comprises all firms that use at least one exemption of IFRS 1 or the covert option for the capitalization of intangibles and another subsample of firms that do not use any exemption or the covert option for the capitalization of intangibles.

Descriptive statistics on the reconciling items of the income statement are presented in Table 7. The most frequently reported income statement reconciling items are “Employee benefits” (41), “Intangible assets” (30), “Share based payments” (29), “Provisions” (23) and “Business combinations” (23).

The most frequent reconciling items of the equity reconciliations which are presented in Table 8 are “Employee benefits” (41), “Intangible assets” (35), “Business combinations” (28), “Property, plant and equipment” (21) and “Provisions” (20).

Overall the topics “Employee benefits”, “Intangible assets”, “Provisions” and “Business combinations” are the most frequent items that induce differences between IFRS and U.S. GAAP incomes and book value of equity. The frequently used IFRS 1 exemptions for pensions and business combinations and the covert option for intangibles as shown in Table 2 especially pertain these reconciliation categories. This finding indicates that reconciliation differences are likely to be driven by the use of IFRS 1 exemptions.

Table 7: Percentage change income statement reconciling items

Item	Frequency	Standard						
		Mean	deviation	Min	0.25	Median	0.75	Max
Share based payments	29	1.50	8.54	-1.68	-0.05	-0.01	0.00	45.88
Revenue recognition	11	-0.01	0.05	-0.08	-0.05	-0.01	0.02	0.09
Financial instruments	11	-0.02	0.07	-0.17	-0.08	-0.02	0.00	0.12
Leasing	7	0.04	0.20	-0.13	-0.06	0.00	0.03	0.48
Inventories	8	0.12	0.26	-0.10	0.00	0.02	0.17	0.71
Property, plant and equipment	15	0.00	0.04	-0.11	-0.01	0.00	0.01	0.06
Employee benefits	41	0.04	0.35	-0.73	-0.01	0.00	0.03	1.94
Provisions	23	-0.11	0.30	-1.33	-0.09	-0.02	0.00	0.18
Consolidation	3	-0.01	0.07	-0.09	-0.09	0.00	0.06	0.06
Foreign currency translations	1	-0.01	-	-0.01	-0.01	-0.01	-0.01	-0.01
Business combinations	23	-0.12	0.35	-1.10	-0.15	-0.01	0.04	0.59
Intangible assets	30	-2.42	13.71	-75.00	0.00	0.02	0.06	0.61
Other	30	-0.07	0.77	-3.79	-0.01	0.00	0.00	1.69
Taxation	49	1.54	10.89	-1.30	-0.02	0.00	0.03	76.18

The table presents grouped reconciliation items derived from income statement reconciliations from U.S. GAAP to IFRS financial statements. The reconciliation items are hand collected from the first annual reports of the transition firms prepared under IFRS. Presented is the percentage change induced by each reconciling item relative to the absolute amount of U.S. GAAP income.

Table 8: Percentage change equity statement reconciling items

Item	Frequency	Standard						
		Mean	deviation	Min	0.25	Median	0.75	Max
Share based payments	5	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Revenue recognition	9	-0.02	0.05	-0.12	-0.01	0.00	0.01	0.02
Financial instruments	16	-0.22	0.87	-3.46	-0.01	0.00	0.01	0.02
Leasing	10	0.01	0.02	-0.02	0.00	0.00	0.01	0.05
Inventories	10	0.01	0.01	-0.01	0.00	0.00	0.01	0.03
Property, plant and equipment	21	-0.01	0.02	-0.05	-0.02	0.00	0.00	0.01
Employee benefits	41	-0.01	0.06	-0.21	-0.01	0.00	0.00	0.23
Provisions	20	-0.01	0.05	-0.10	-0.04	0.00	0.01	0.13
Consolidation	4	-0.01	0.01	-0.02	-0.01	0.00	0.00	0.00
Foreign currency translations	6	-0.01	0.02	-0.04	-0.02	0.00	0.00	0.00
Business combinations	28	-0.01	0.12	-0.22	-0.04	0.00	0.00	0.51
Intangible assets	35	0.01	0.29	-1.20	0.00	0.00	0.06	0.90
Other	31	0.00	0.03	-0.02	-0.01	0.00	0.00	0.13
Taxation	55	0.01	0.08	-0.20	0.00	0.00	0.02	0.41

The table presents grouped reconciliation items derived from book value of equity reconciliation from U.S. GAAP to IFRS financial statements. The reconciliation items are hand collected from the first financial statements of the transition firms prepared under IFRS. Presented is the percentage change induced by each reconciling item relative to the absolute amount of U.S. GAAP equity.

3.3.2. Research design accounting comparability tests

We adopt the accounting comparability measures of Barth et al. (2011) that are based on a measure developed by De Franco et al. (2011). De Franco et al. (2011) regard accounting standards as a function between accounting outcomes and economic events. This function is derived from the definition of comparability, that a given set of economic events is represented similarly in accounting outcomes. De Franco et al. (2011) use earnings as proxy for financial statements and returns as proxy for economic events. Barth et al. (2011) add two alternative proxies for economic events, stock prices and operating cash flows, and relate them to book value of equity and earnings as summary measures of financial statements.

The measures are conducted in three major steps: first, the functions between accounting amounts and economic events are derived by regressions of accounting amounts of firms applying either U.S. GAAP or IFRS on their respective economic events. Thus, for U.S. GAAP and IFRS a unique function is derived.

Second, given the function of an accounting system, for an observed accounting outcome the related economic event is estimated that would be expected if that accounting system was applied. Hence, for each firm we estimate one economic event that would be expected under U.S. GAAP and one economic event that would be expected under IFRS, given the firms' accounting amount.

In a third step, the difference in the fitted economic events of each firm is ascertained to assess the difference in the reflection of economic events in a firms' accounting amounts prepared under U.S. GAAP and IFRS.⁹

We use the following regression models to derive functions required to estimate the fitted economic outcomes¹⁰ stock price, stock return and cash flow based on individual firms' accounting amounts.¹¹ Our first model is a regression of stock prices on earnings and book value of equity:¹²

$$P_{i,t} = \beta_0 + \beta_1 E_{i,t} + \beta_2 BVE_{i,t} + \varepsilon_{i,t} \quad (1)$$

where

P is the closing price of a companies' stock at its fiscal year end, from the Datastream database (05001);

E is earnings per share before extraordinary items at a firms' fiscal year end, from the Datastream database (05201);

BVE is book value of equity per share calculated as common equity over the number of shares outstanding both measured at the firms' year end, from the Datastream database (03501/05301).

Our second model is a regression of returns on earnings per share and changes in earnings per share:

$$RET_{i,t} = \beta_0 + \beta_1 EPS_{i,t} + \beta_2 \Delta EPS_{i,t} + \beta_3 LOSS_{i,t} + \beta_4 LOSS_{i,t} \times EPS_{i,t} + \beta_5 LOSS_{i,t} \times \Delta EPS_{i,t} + \varepsilon_{i,t} \quad (2)$$

where

RET is the 12-month stock return measured in the period beginning 3 months after year end of fiscal period t-1 and ending 3 months after year end of fiscal period t, from the Datastream database (RI);¹³

⁹ As the calculation of this comparability measure is very complex we provide an illustrative numerical example of the calculation in the Appendix.

¹⁰ We use the terms „economic events“ and „economic outcomes“ interchangeably.

¹¹ For an illustration see step one of our numerical example in the Appendix.

¹² We also run this regression excluding negative earnings. Results of all tests remain qualitatively unchanged.

¹³ Instead of 12-month stock returns we also use 15-month stock returns measured from the beginning of fiscal period t-1 and ending 3 months after year end of fiscal period t. However, our results become insignificant if we use 15-month stock returns.

EPS is earnings per share before extraordinary items at a firms' fiscal year end (from the Datastream database (05201)) scaled by the closing price of a firms' stock (from the Datastream database (05001)) at previous fiscal year end;

ΔEPS is the change in earnings per share before extraordinary items (from the Datastream database (05201)) in fiscal period t compared to earnings per share of firms' fiscal period t-1, scaled by the closing price of a firms' stock (from the Datastream database (05001)) at previous fiscal year end;

LOSS is a dummy variable that is 1 if earnings per share at a firms' fiscal year end are negative and 0 otherwise.

Consistent with Hayn (1995) we control for negative earnings. Losses might have a negative impact on the association between returns and earnings. As the within-firm difference in the association between returns and earnings across periods is of our main interest we control for factors that are transitory across periods and include the control for negative earnings. Due to their higher variability (negative) earnings are different compared to other, more permanent factors that might have an influence on the association between returns and earnings, as for example firm size (Freeman (1987)). The regression design is consistent with Barth et al. (2011).

The third model is solely based on accounting data and maps cash flows on lagged earnings:

$$CF_{i,t} = \beta_0 + \beta_1 NI_{i,t-1} + \varepsilon_{i,t} \quad (3)$$

where

CF is the cash flow from operating activities (from the Datastream database (04860)) scaled with firms' total assets (from the Datastream database (02999)) at firms' previous fiscal year end;

NI is earnings before extraordinary items at firms' previous fiscal year end, from the Datastream database (01551) scaled with firms' total assets

(from the Datastream database (02999)) at firms' fiscal year end before its previous fiscal year end.¹⁴

The economic outcomes stock price and returns are chosen as they are viewed as summary measures of investment decisions made by investors (Barth et al. (2011)). It is the general purpose of IFRS to provide useful information for the decision about the provision of resources to a firm.¹⁵ In line with Barth et al. (2011) we also use cash flows as economic outcome. If equity value is measured with models that base future cash flows on earnings, the predictive ability of earnings for future cash flows is important for investors' equity valuations and thus for investors' capital allocation decisions.

We run each regression model four times respectively using the pooled observations of the control and the transition group in pre- and post-IFRS adoption periods. From the regressions we respectively derive functions between accounting amounts and economic outcomes for the control firms and transition firms. We calculate two fitted economic outcomes based on the accounting outcomes of the transition firms using the functions of the transition firms and then the functions of the control firms.¹⁶ The fitted economic outcomes are calculated as follows:¹⁷

Fitted stock prices:

$$\hat{P}_{i,t}^{\text{trans, trans}} = \beta_0^{\text{trans}} + \beta_1^{\text{trans}} E_{i,t}^{\text{trans}} + \beta_2^{\text{trans}} BVE_{i,t}^{\text{trans}} + \varepsilon_{i,t} \quad (4a)$$

$$\hat{P}_{i,t}^{\text{con, trans}} = \beta_0^{\text{con}} + \beta_1^{\text{con}} E_{i,t}^{\text{trans}} + \beta_2^{\text{con}} BVE_{i,t}^{\text{trans}} + \varepsilon_{i,t} \quad (4b)$$

Fitted returns:

¹⁴The variable reflects the same earnings number as the previously introduced variable EPS. However, it is not used on per share-basis. In addition, the scaling is different. EPS is scaled with stock prices to account for the percentage "earnings return" on stock prices. NI is scaled with total assets as the cash-flow measure is intended to be solely based on accounting data.

¹⁵ The conceptual framework for financial reporting, OB12.

¹⁶ For an illustration see step two of our numerical example in the Appendix.

¹⁷ "Trans" indicates accounting amounts or multiples of the transition firms, "con" indicates accounting amounts or multiples of the control firms.

$$\widehat{RET}_{i,t}^{\text{trans, trans}} = \beta_0^{\text{trans}} + \beta_1^{\text{trans}} EPS_{i,t}^{\text{trans}} + \beta_2^{\text{trans}} \Delta EPS_{i,t}^{\text{trans}} + \beta_3^{\text{trans}} LOSS_{i,t}^{\text{trans}} + \beta_4^{\text{trans}} LOSS_{i,t}^{\text{trans}} \times EPS_{i,t}^{\text{trans}} + \beta_5^{\text{trans}} LOSS_{i,t}^{\text{trans}} \times \Delta EPS_{i,t}^{\text{trans}} + \varepsilon_{i,t} \quad (5a)$$

$$\widehat{RET}_{i,t}^{\text{con, trans}} = \beta_0^{\text{con}} + \beta_1^{\text{con}} EPS_{i,t}^{\text{trans}} + \beta_2^{\text{con}} \Delta EPS_{i,t}^{\text{trans}} + \beta_3^{\text{con}} LOSS_{i,t}^{\text{trans}} + \beta_4^{\text{con}} LOSS_{i,t}^{\text{trans}} \times EPS_{i,t}^{\text{trans}} + \beta_5^{\text{con}} LOSS_{i,t}^{\text{trans}} \times \Delta EPS_{i,t}^{\text{trans}} + \varepsilon_{i,t} \quad (5b)$$

Fitted cash flows:

$$\widehat{CF}_{i,t}^{\text{trans, trans}} = \beta_0^{\text{trans}} + \beta_1^{\text{trans}} NI_{i,t-1}^{\text{trans}} + \varepsilon_{i,t} \quad (6a)$$

$$\widehat{CF}_{i,t}^{\text{con, trans}} = \beta_0^{\text{con}} + \beta_1^{\text{con}} NI_{i,t-1}^{\text{trans}} + \varepsilon_{i,t} \quad (6b)$$

Next, we determine the absolute amount of the differences in fitted economic outcomes of each firm derived in equations 4a to 6b. The differences are calculated as follows:¹⁸

Difference in fitted stock prices (*P-Diff*):

$$P\text{-Diff}_{i,t}^{\text{trans}} = |\widehat{P}_{i,t}^{\text{trans, trans}} - \widehat{P}_{i,t}^{\text{con, trans}}| \quad (7)$$

Difference in fitted returns (*RET-Diff*):

$$RET\text{-Diff}_{i,t}^{\text{trans}} = |\widehat{RET}_{i,t}^{\text{trans, trans}} - \widehat{RET}_{i,t}^{\text{con, trans}}| \quad (8)$$

Difference in fitted cash flows (*CF-Diff*):

$$CF\text{-Diff}_{i,t}^{\text{trans}} = |\widehat{CF}_{i,t}^{\text{trans, trans}} - \widehat{CF}_{i,t}^{\text{con, trans}}| \quad (9)$$

Again we apply equation 4a to 9 to the accounting amounts of the control firms and then calculate the average of the differences in fitted economic outcomes for each matched pair of firms from the transition and the control group.¹⁹ The mean and median of these average differences is our indicator for comparability between transition firms and control firms. The procedure from equation 1 to 9 is respectively conducted in pre-IFRS adoption

¹⁸ For an illustration see step three of our numerical example in Appendix.

¹⁹ For an illustration see step four of our numerical example in Appendix.

periods and in post-IFRS adoption periods. The results from pre-IFRS and post-IFRS adoption periods are then compared with each other.

If mean and median of average differences in fitted economic outcomes are significantly smaller in post-IFRS adoption periods than in pre-IFRS adoption periods, comparability between firms increased after transition firms adopted IFRS and hypothesis H_1 would be confirmed. Comparability between firms decreased after adoption of IFRS if mean and median significantly increase in post-IFRS adoption periods.

For the test of our hypothesis H_2 we partition the entire sample into two subsamples and repeat all tests for both subsamples. Subsample one comprises all firms that exercise IFRS 1 exemptions with an effect on the amount of equity. Subsample two comprises all firms that do not exercise any IFRS 1 exemptions.²⁰

3.3.3. Sample composition

We identify 108 firms in Germany that adopted U.S. GAAP between 1995 and 2003 and 646 firms that adopted IFRS between 1996 and 2007. As the latter constantly followed IFRS we use these firms as a control group in our analysis. The number of firms constantly following IFRS is much larger than the number of firms transitioning from U.S. GAAP to IFRS. This allows us to match firms that transition from U.S. GAAP to IFRS on firms that constantly follow IFRS based on one-digit SIC-codes and total assets. Firms are matched based on financial data in 2005 as most firms transition to IFRS in that year and thus 2005 lies in the center of all analyzed periods. It is important that firms used as

²⁰As mentioned before this group also comprises firms that exercise the IFRS 1 exemption for currency translation differences.

control group adopted IFRS at least two years before the transitioning firms switch from U.S. GAAP to IFRS. With the matching procedure we indentify an appropriate control firm for each transitioning firm with similar characteristics regarding industry classification and size. Having identified the transition group and control group, we obtain a difference-in-differences setting (Meyer (1995)) that is illustrated by Figure 1.

Figure 1: Difference-in-differences design

	Transition group	Control group
Pre-adoption	US GAAP	IFRS
Post-adoption	IFRS	IFRS

This figure illustrates the difference-in-differences research design applied in this study. Two subsamples are presented in the figure, one transition group and one control group. The subsamples are analyzed over a pre-IFRS adoption period and a post-IFRS adoption period. We investigate comparability between the transition group and the control group in pre- and post-IFRS adoption periods and determine the change in comparability between these periods.

Our sample composition is summarized in Table 9. We analyze 108 transition firms and 108 matched control firms over 4 periods, providing us with a maximum of 864 firm year observations in our regression analyses. We calculate fitted economic outcomes based on these regressions on a firm level basis. Differences between fitted economic outcomes are averaged between transition firms and control firms, resulting in a maximum of 432 average fitted economic outcomes.

Table 9: Sample composition

German firms transitioning from U.S. GAAP to IFRS	108
+ Matched firms following IFRS	108
Sum	216
Analyzed over 2 pre- and 2 post adoption periods	x4
Firm year observations	864
Periodic average differences in fitted economic outcomes of transitioning and control firms used	/2
Sum	432
Missing data in regression models 4a,b/5a,b/6a,b	77/110/106
Sum	355/322/326

3.4. Empirical results

3.4.1. Effects of IFRS adoption on comparability

Table 10 presents descriptive statistics of all data used in the regressions.²¹ All variables are winsorized at a 5% level.²² We distinguish between data of the transition firms and the control firms in pre- and post-IFRS adoption periods. Stock prices and earnings per share increase between pre- and post-transition periods for both groups of firms. In addition both groups have larger returns in pre- than in post-transition periods and book value of equity and operating cash flows are almost stable between pre- and post-transition periods. The overall change in variables between the pre- and the post-adoption period is very similar for both, the transition sample and the matched control group of firms.

Table 11 presents the empirical results of our comparability tests. Panel A reports the median and mean of differences in fitted stock prices for pre-

²¹All transition firms with available data are included. 19 out of 108 transition firms have a different fiscal yearend than December, 31st. Their matched counterparts might have a deviating yearend. Our results remain qualitatively the same when we exclude all firms from our tests that have a yearend different than December, 31st.

²²Our results are insensitive to a different outlier treatment as the truncating or winsorizing of variables at 1%, 2%, 3%, 4% and 5% levels.

IFRS adoption periods and post-IFRS adoption periods, respectively. Mean and median are smaller in pre-IFRS adoption periods (mean: 1.24; median: 0.90) when transition firms follow U.S. GAAP and control firms apply IFRS. In post-IFRS adoption periods mean and median increase (mean: 3.38; median: 2.41), indicating larger differences in fitted stock prices when both groups of firms follow IFRS. The difference in mean (2.14) and median (1.51) is significant at a 1% level.

Panel B reports mean and median of differences in fitted returns. Differences in fitted returns are larger in pre-IFRS adoption periods (mean: 0.15; median: 0.13) than in post-IFRS adoption periods (mean: 0.10; median: 0.06). The difference in differences between pre- and post-IFRS adoption periods (mean: -0.05; median: -0.07) is significant at a 1% level. This result indicates a higher comparability when transitioning and control firms follow IFRS compared to pre-adoption periods, when transitioning firms follow U.S. GAAP.

Panel C presents mean and median of differences in fitted cash flows. As for fitted returns, mean and median in post-IFRS adoption periods (mean: 0.00; median: 0.00) are smaller than in pre-IFRS adoption periods (mean: 0.03; median: 0.02). Fitted cash flows are more comparable when transitioning firms and control firms follow IFRS. The difference in differences between mean and median of pre- and post-IFRS adoption periods is significant at a 1% level.

Before transitioning firms adopt IFRS mean and median are different from zero for all fitted economic outcomes. This indicates that the two groups of firms that apply U.S. GAAP or IFRS are not fully comparable. Two out of three fitted economic outcomes are significantly more comparable when all firms follow IFRS. This indicates an improvement in comparability of

accounting outcomes. The significant change confirms hypothesis H₁. However, comparability decreases for fitted stock prices, after transitioning firms adopt IFRS. Stock price is the only fitted economic outcome that is mainly dependent on firms' book value of equity. Considering our index-based analysis of reconciliation differences which indicates that transition effects can have major effects on book value of equity, the lower comparability in post-IFRS adoption periods is not surprising. As shown in Table 6 users of IFRS 1 exemptions show more frequent and larger changes in book value of equity upon transition to IFRS compared to non-users. The use of exemptions induces transitory effects on book value of equity that might decrease comparability between transitioning firms and firms constantly following IFRS. We argue that these transition effects have a negative effect on comparability of book value of equity and influence the results of our test for hypothesis 1. We assess the negative effect of the transition effects on comparability in our test for hypothesis H₂.

Table 10: Descriptive statistics comparability test

Control-firms, pre transition periods							Transition-firms, pre transition periods						
Variable	n	Mean	S.D.	Min	0.25	Max	Variable	n	Mean	S.D.	Min	0.25	Max
<i>P</i>	169	11.66	13.55	1.00	2.62	46.93	<i>P</i>	169	11.39	12.84	1.00	2.80	46.93
<i>BVE</i>	169	7.68	8.75	0.11	1.93	30.43	<i>BVE</i>	169	6.94	7.74	0.11	1.74	30.43
<i>E</i>	176	0.05	1.68	-4.01	-0.54	3.38	<i>E</i>	176	0.06	1.66	-4.01	-0.57	3.38
<i>RET</i>	160	0.53	0.98	-0.67	-0.14	3.16	<i>RET</i>	160	0.54	1.01	-0.67	-0.13	3.16
<i>CF</i>	169	0.07	0.13	-0.32	0.01	0.32	<i>CF</i>	169	0.03	0.14	-0.32	-0.02	0.32

Control-firms, post transition periods							Transition-firms, post transition periods						
Variable	n	Mean	S.D.	Min	0.25	Max	Variable	n	Mean	S.D.	Min	0.25	Max
<i>P</i>	186	17.36	22.96	1.05	3.35	81.43	<i>P</i>	186	15.40	19.78	1.05	3.20	81.43
<i>BVE</i>	186	7.64	8.94	0.17	2.15	31.72	<i>BVE</i>	186	7.17	8.18	0.17	1.68	31.72
<i>E</i>	211	0.59	1.53	-2.15	-0.15	4.41	<i>E</i>	211	0.39	1.44	-2.15	-0.17	4.41
<i>RET</i>	162	0.14	0.45	-0.48	-0.20	1.13	<i>RET</i>	162	0.19	0.43	-0.48	-0.12	1.13
<i>CF</i>	157	0.05	0.14	-0.24	-0.02	0.33	<i>CF</i>	157	0.06	0.11	-0.24	0.00	0.33

P is the closing price of a companies' stock at its fiscal year end, from the Datastream database (05001); *BVE* is book value of equity per share calculated as common equity over the number of shares outstanding both measured at the firms' year end, from the Datastream database (03501/05301); *E* is earnings per share before extraordinary items at a firms' fiscal year end, from the Datastream database (05201); *RET* is the 12-month stock return measured in the period beginning 3 months after year end of fiscal period t-1 and ending 3 months after year end of fiscal period t, from the Datastream database (RI); *CF* is the cash flow from operating activities (from the Datastream database (04860)) scaled by firms' total assets (from the Datastream database (02999)) at firms' previous fiscal year end. The tables present descriptive statistics for the transition firms that switch from U.S. GAAP to IFRS and for the matched counterparts, the control firms that constantly follow IFRS. The data is presented for pre- and post-IFRS adoption periods of the transition-firms.

Table 11: Empirical results comparability tests

Panel A						
Price difference	Observations	Median	Mean	Standard error	Standard deviation	99% confidence interval
pre-adoption	169	0.90	1.24	0.08	1.05	1.03 1.45
post-adoption	186	2.41	3.38	0.22	2.99	2.81 3.95
combined	355	1.42	2.36	0.13	2.51	2.01 2.71
difference		1.51 ***	2.14 ***	0.24	1.51	1.51 2.76
Panel B						
Return difference	Observations	Median	Mean	Standard error	Standard deviation	99% confidence interval
pre-adoption	160	0.13	0.15	0.01	0.15	0.12 0.18
post-adoption	162	0.06	0.10	0.01	0.09	0.08 0.11
combined	322	0.08	0.12	0.01	0.13	0.10 0.14
difference		-0.07 ***	-0.05 ***	0.01	-0.09	-0.09 -0.02
Panel C						
Cash flow difference	Observations	Median	Mean	Standard error	Standard deviation	99% confidence interval
pre-adoption	169	0.02	0.03	0.00	0.02	0.03 0.04
post-adoption	157	0.00	0.00	0.00	0.00	0.00 0.01
combined	326	0.01	0.02	0.00	0.02	0.01 0.02
difference		-0.02 ***	-0.03 ***	0.00	-0.03	-0.03 -0.02

The table presents the mean and median of differences in fitted stock prices, returns and cash flows. Fitted economic outcomes are calculated with individual firms accounting amounts and functions between economic outcomes and accounting amounts derived from transition firms and control firms, respectively. The differences between these fitted economic outcomes are calculated for pre-IFRS adoption periods in which transition firms follow U.S. GAAP and post-IFRS adoption periods in which transition firms follow IFRS.

3.4.2. Effects induced by the use of IFRS 1 exemptions

For the tests of hypothesis 2 we partition our sample of transitioning firms into two groups. First, the firms that exercise IFRS 1 exemptions with an effect on the amount of equity and second, firms that do not exercise IFRS 1 exemptions with an effect on the amount of equity.²³ We expect that comparability of book value of equity for the first group of firms is negatively affected relative to the second group of firms. A lower comparability of book value of equity is reflected in larger differences between fitted stock prices, as these are mainly dependent on book value of equity. We are hence primarily interested in fitted stock price differences but conduct our other two comparability measures for reasons of completeness.

Table 12 reports empirical results for the subsample of firms that exercise at least one IFRS 1 exemption with an effect on the amount of equity. Compared to the full sample test all results remain qualitatively the same. Differences in fitted returns of pre- and post-adoption periods decrease after transition to IFRS (mean: -0.21; median: -0.16). Also differences between fitted cash flows of pre- and post-adoption periods decrease after transition to IFRS (mean: -0.01; median: 0.00). Only the difference in fitted stock prices increases significantly after adoption of IFRS (mean: 2.30; median: 1.50), indicating lower comparability of book value of equity in post-adoption periods.

²³We do not partition the two subsamples based on the overall difference in book value of equity prepared under U.S. GAAP and IFRS. Differences in book value of equity can be induced by differences in accounting standards. However, we aim to isolate differences in book value of equity induced by exemptions used upon transition to IFRS. As the impact of the use of exemptions on book value of equity cannot be measured we separate between users of IFRS 1 exemptions and non-users.

Table 12: Empirical results comparability tests – subsample of firms exercising IFRS 1 exemptions

Panel A						
Price difference	Observations	Median	Mean	Standard error	Standard deviation	99% confidence interval
pre-adoption	70	0.56	0.88	0.09	0.75	0.64 1.12
post-adoption	80	2.06	3.18	0.33	2.97	2.30 4.05
combined	150	1.27	2.10	0.20	2.50	1.57 2.64
difference		1.50 ***	2.30 ***	0.37	1.34	1.34 3.25
Panel B						
Return difference	Observations	Median	Mean	Standard error	Standard deviation	99% confidence interval
pre-adoption	68	0.24	0.32	0.04	0.33	0.21 0.42
post-adoption	67	0.08	0.11	0.01	0.09	0.08 0.14
combined	135	0.16	0.21	0.02	0.26	0.16 0.27
difference		-0.16 ***	-0.21 ***	0.04	-0.32	-0.32 -0.10
Panel C						
Cash flow difference	Observations	Median	Mean	Standard error	Standard deviation	99% confidence interval
pre-adoption	74	0.02	0.03	0.00	0.02	0.03 0.04
post-adoption	76	0.02	0.02	0.00	0.00	0.02 0.02
combined	150	0.02	0.03	0.00	0.02	0.02 0.03
difference		0.00	-0.01 ***	0.00	-0.02	-0.02 0.00

The table presents the mean and median of differences in fitted stock prices, returns and cash flows. Fitted economic outcomes are calculated with individual firms accounting amounts and functions between economic outcomes and accounting amounts derived from transition firms and control firms, respectively. The differences between these fitted economic outcomes are calculated for pre-IFRS adoption periods in which transition firms follow U.S. GAAP and post-IFRS adoption periods in which transition firms follow IFRS.

We investigate a second subsample consisting of firms that do not make use of the covert option for intangibles or the IFRS 1 exemptions. The results are presented in Table 13. Again, differences in fitted returns decrease in post-transition periods (mean: -0.09; median: -0.05) as well as differences in fitted cash flows (mean: -0.01; median: -0.01). We do not find a significant change of differences in fitted stock prices between pre- and post-adoption periods for this subsample. Instead, the results indicate that book value of equity remains unaffected for transitioning firms that do not make use of the covert option for intangibles or the IFRS 1 exemptions.

The results of our subsample tests show that the use of the covert option for intangibles and the IFRS 1 exemptions is a driver for larger differences in fitted stock prices in post-IFRS adoption periods. Fitted stock prices are largely dependent on book value of equity which is affected by the covert option for intangibles and the IFRS 1 exemptions. Transition effects that occur when the covert option for intangibles and the IFRS 1 exemptions are used distort the amount of book value of equity which is reflected in increasing fitted stock price differences. For the subsample of firms that use IFRS 1 exemptions fitted stock price differences increase in post-IFRS adoption periods, confirming our hypothesis H₂. The larger differences in stock prices are driven by a lower comparability in book value of equity. Comparability of fitted stock prices does not change for the second group of firms that do not use IFRS 1 exemptions. Hence, our results indicate that comparability of book value of equity is negatively affected by if IFRS 1 exemptions or the covert option for capitalization of intangible assets are used.

Table 13: Empirical results comparability tests – subsample of firms not exercising IFRS 1 exemptions

Panel A						
Price difference	Observations	Median	Mean	Standard error	Standard deviation	99% confidence interval
pre-adoption	95	3.92	4.86	0.42	4.11	4.16 5.56
post-adoption	104	3.48	5.32	0.50	5.05	4.50 6.14
combined	199	3.68	5.10	0.33	4.62	4.56 5.64
difference		0.44	0.46	0.66		-0.63 1.54
Panel B						
Return difference	Observations	Median	Mean	Standard error	Standard deviation	99% confidence interval
pre-adoption	92	0.12	0.20	0.03	0.25	0.13 0.27
post-adoption	94	0.07	0.11	0.01	0.10	0.08 0.13
combined	186	0.10	0.15	0.01	0.20	0.11 0.19
difference		-0.05 ***	-0.09 ***	0.03		-0.17 -0.02
Panel C						
Cash flow difference	Observations	Median	Mean	Standard error	Standard deviation	99% confidence interval
pre-adoption	97	0.03	0.03	0.00	0.01	0.02 0.03
post-adoption	79	0.02	0.02	0.00	0.01	0.02 0.02
combined	176	0.02	0.02	0.00	0.01	0.02 0.03
difference		-0.01 ***	-0.01 ***	0.00		-0.01 0.00

The table presents the mean and median of differences in fitted stock prices, returns and cash flows. Fitted economic outcomes are calculated with individual firms accounting amounts and functions between economic outcomes and accounting amounts derived from transition firms and control firms, respectively. The differences between these fitted economic outcomes are calculated for pre-IFRS adoption periods in which transition firms follow U.S. GAAP and post-IFRS adoption periods in which transition firms follow IFRS.

3.5. Alternative analyses

We repeat our analysis in a second set of tests this time using firms that constantly follow U.S. GAAP accounting standards during all analyzed periods as control group. We conduct this alternative analysis to verify our comparability measures. Relative to the control group, the transitioning firms now switch from similar to different accounting standards. Hence, we expect our comparability measures to indicate a lower comparability in post-adoption periods, opposed to our first analyses with an IFRS control group.

As there are no firms in Germany that kept following U.S. GAAP accounting standards we match the transition group of 108 firms upon a group out of 5,985 firms listed in the USA that constantly follow U.S. GAAP accounting standards. We match firms based on two digit SIC-codes and total assets.²⁴

Contrary to our first set of tests we expect accounting outcomes, i.e. fitted returns and fitted cash flows to be more comparable in pre-IFRS adoption periods when firms of the transition group and the control group follow U.S. GAAP compared to post-adoption periods when transitioning firms follow IFRS. Again, we expect fitted stock prices to be less comparable in post-IFRS adoption periods because of the transition effects of the exemptions of IFRS 1 and the covert option for intangible assets.

We provide descriptive statistics on the transition group and the control group consisting of US-listed firms in Table 14. Descriptive statistics are similar compared to the sample with the German control firms. Stock prices and earnings per share increase between pre- and post-transition periods for

²⁴We use two-digit SIC codes instead of one-digit SIC codes as we have a much larger choice between appropriate control firms when we use firms that are listed in the USA compared to the original setting that is solely limited to firms listed in Germany.

both the transition group and the control group of firms. Returns are larger in pre- than in post-transition periods and book value of equity and operating cash flows are nearly stable between pre- and post-transition periods for both, the control and the transition group.

Table 14: Descriptive statistics comparability test – US-control group

US-firms, pre transition periods							Transition-firms, pre transition periods						
Variable	n	Mean	S.D.	Min	0.25	Max	Variable	n	Mean	S.D.	Min	0.25	Max
<i>P</i>	143	12.55	11.15	0.70	3.77	44.65	<i>P</i>	143	10.10	11.10	0.70	2.70	44.65
<i>BVE</i>	143	5.80	6.35	0.25	1.29	22.50	<i>BVE</i>	143	6.23	6.08	0.25	1.78	22.50
<i>E</i>	152	-0.19	1.41	-3.65	-0.69	2.73	<i>E</i>	152	-0.05	1.40	-3.65	-0.62	2.73
<i>RET</i>	131	0.72	1.46	-0.70	-0.17	4.75	<i>RET</i>	131	0.68	1.23	-0.70	-0.15	4.75
<i>CF</i>	148	-0.01	0.22	-0.51	-0.10	0.32	<i>CF</i>	148	0.03	0.16	-0.51	-0.02	0.32

US-firms, post transition periods							Transition-firms, post transition periods						
Variable	n	Mean	S.D.	Min	0.25	Max	Variable	n	Mean	S.D.	Min	0.25	Max
<i>P</i>	151	15.52	16.01	0.49	3.93	60.10	<i>P</i>	151	13.04	15.78	0.49	2.99	60.10
<i>BVE</i>	151	6.28	6.58	0.32	1.43	23.73	<i>BVE</i>	151	6.27	6.73	0.32	1.43	23.73
<i>E</i>	153	0.09	1.46	-3.41	-0.45	3.53	<i>E</i>	153	0.16	1.43	-3.41	-0.36	3.53
<i>RET</i>	136	0.13	0.50	-0.58	-0.22	1.29	<i>RET</i>	136	0.18	0.43	-0.58	-0.12	1.29
<i>CF</i>	121	0.01	0.19	-0.45	-0.08	0.32	<i>CF</i>	121	0.05	0.13	-0.45	0.01	0.32

P is the closing price of a companies' stock at its fiscal year end, from the Datastream database (05001); *BVE* is book value of equity per share calculated as common equity over the number of shares outstanding both measured at the firms' year end, from the Datastream database (03501/05301); *E* is earnings per share before extraordinary items at a firms' fiscal year end, from the Datastream database (05201); *RET* is the 12-month stock return measured in the period beginning 3 months after year end of fiscal period t-1 and ending 3 months after year end of fiscal period t, from the Datastream database (RI); *CF* is the cash flow from operating activities (from the Datastream database (04860)) scaled with firms' total assets (from the Datastream database (02999)) at firms' previous fiscal year end. The tables present descriptive statistics for the transition firms that switch from U.S. GAAP to IFRS and for the matched counterparts, the US-firms that constantly follow U.S. GAAP. The data is presented for pre- and post-IFRS adoption periods of the transition-firms.

Table 15 reports the empirical results. Panel A shows differences in fitted stock prices. Differences in fitted stock prices of pre- and post-adoption periods increase significantly after transition to IFRS (mean: 1.35; median: 1.24). This indicates that fitted stock prices are less comparable after transitioning firms adopt IFRS. The result is in line with our expectations as book value of equity of the transitioning firms is affected by transition effects. These effects are induced by the exemptions of IFRS 1 and the covert option for intangible assets that distort book value of equity resulting in a lower comparability to book value of equity of firms constantly following IFRS and of firms constantly following U.S. GAAP.

Panel B presents the results for fitted returns. No significant difference in differences in pre- and post-transition periods can be identified. Mean and median are insignificant.

Differences in fitted cash flows are shown in Panel C. Differences in fitted cash flows significantly increase in post-adoption periods (mean: 0.01; median: 0.02). This result indicates the expected decrease in comparability after transition firms adopt IFRS. Overall the results support our finding that a switch in the accounting standard system from U.S. GAAP to IFRS does affect comparability of accounting outcomes. Accounting amounts of firms that transition from U.S. GAAP to IFRS are more comparable to accounting amounts of firms following U.S. GAAP in pre-IFRS adoption periods than in post-IFRS adoption periods. Compared to accounting amounts of firms following IFRS they are more comparable in post-IFRS adoption periods than in pre-IFRS adoption periods.

Table 15: Empirical results comparability tests – US control group

Panel A						
Price difference	Observations	Median	Mean	Standard error	Standard deviation	99% confidence interval
pre-adoption	143	3.34	3.21	0.09	1.04	2.99 3.44
post-adoption	151	4.58	4.57	0.12	1.44	4.26 4.87
combined	294	3.93	3.91	0.08	1.43	3.69 4.12
difference		1.24 ***	1.35 ***	0.15		0.97 1.73
Panel B						
Return difference	Observations	Median	Mean	Standard error	Standard deviation	99% confidence interval
pre-adoption	131	0.12	0.23	0.09	1.06	0.08 0.39
post-adoption	136	0.07	0.09	0.01	0.11	0.07 0.11
combined	267	0.07	0.16	0.05	0.75	0.08 0.24
difference		-0.05	-0.14	0.09		-0.29 0.01
Panel C						
Cash flow difference	Observations	Median	Mean	Standard error	Standard deviation	99% confidence interval
pre-adoption	148	0.01	0.01	0.00	0.01	0.01 0.02
post-adoption	121	0.03	0.03	0.00	0.01	0.02 0.03
combined	269	0.02	0.02	0.00	0.01	0.02 0.02
difference		0.02 ***	0.01 ***	0.00		0.01 0.02

The table presents the mean and median of differences in fitted stock prices, returns and cash flows. Fitted economic outcomes are calculated with individual firms accounting amounts and functions between economic outcomes and accounting amounts derived from transition firms and control firms, respectively. The differences between these fitted economic outcomes are calculated for pre-IFRS adoption periods in which transition firms follow U.S. GAAP and post-IFRS adoption periods in which transition firms follow IFRS.

3.6. Conclusion

We test comparability of accounting amounts between German firms that transition from U.S. GAAP to IFRS and a group of German firms that constantly follow IFRS. Our tests compare firms that first use different and then identical sets of accounting standards in the same institutional setting. Using this difference in differences sample in a single country we mitigate concerns that we capture effects on comparability induced by other factors than changes in accounting standards.

The IASB and FASB are striving to converge their accounting standards with the objective to increase comparability between financial statements of firms that follow U.S. GAAP or IFRS. In addition the SEC currently considers mandatory adoption of IFRS in the US. In this context effects of mandatory IFRS adoption on comparability between financial statements of US-firms and foreign firms applying IFRS are debated. Our study contributes to the current debate in the US as it investigates the effect on comparability between financial statements of firms that switch their accounting system from U.S. GAAP to IFRS and firms that constantly follow IFRS. Also implications for the ongoing convergence process between IASB and FASB can be drawn. We show that differences in the accounting standard systems do affect financial statement comparability.

We adopt a set of three accounting comparability tests from the study of Barth et al. (2011) that are based on a measure developed by De Franco et al. (2011). For each group of firms that transition from U.S. GAAP to IFRS or constantly follow IFRS we derive functions between accounting outcomes and economic outcomes. Based on these functions and the summary measures of financial statements we calculate fitted economic outcomes. The fitted

economic outcomes reflect economic outcomes that would be expected if a firm applied U.S. GAAP or IFRS given its accounting outcomes. For each firm the magnitude of the difference in these fitted economic outcomes is assessed in pre- and post-IFRS transition periods. The difference in these differences reflects the effect of a change in accounting standards on comparability.

Analyzing a sample of 108 German firms that transition from U.S. GAAP to IFRS and a control group of German firms that constantly follow IFRS we find an overall increase of comparability in post-IFRS adoption periods.

However, one out of three comparability measures, the fitted stock prices, show a lower comparability in post-IFRS transition periods. Fitted stock prices are mainly dependent on book value of equity which is affected by the exemptions of IFRS 1 and the covert option for intangible assets upon transition to IFRS. Hence, we refer this decrease in comparability of fitted stock prices to transition effects that are induced by the exemptions of IFRS 1 and the covert option for the capitalization of intangible assets included in IAS 38. We partition our sample of German firms into a group of firms that did make use of the exemptions or the covert option and a group of non-users. For the subsample of firms that use the exemptions and covert option we find a decrease in comparability of fitted stock prices in post-transition periods. For the non-users we find no changes in comparability of fitted stock prices. The tests indicate that the use of IFRS 1 exemptions is driving the decrease of comparability of book value of equity in post-IFRS transition periods.

We conduct a second set of tests to support our results using a matched sample of US-firms as control group for the German firms that transition from U.S. GAAP to IFRS. We find that firms are more comparable in pre-transition

periods when both groups of firms apply U.S. GAAP accounting standards than in post-transition periods when transitioning firms follow IFRS.

3.7. References

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3.8. Appendix

Illustrative numerical example comparability measure

	Returns		Earnings	
	Pre	Post	Pre	Post
Firm A	5	5	5	5
Firm B	10	10	5	10

Table A1: Returns and earnings in pre- and post-adoption periods

Table 1 presents two firms, firm A and firm B, and their respective returns and earnings in a pre- and a post-adoption period. In our example earnings increase by one unit for each unit of returns, except for firm B in the pre-adoption period. In the pre-adoption period earnings of firm B only increase 0.5 units for each unit of returns. Hence, earnings reflect the same economic events differently for firm B compared to firm A in the pre-adoption period.

In the **first step** we derive functions between returns and earnings for each firm in pre- and post- adoption periods separately. The functions reflect the relation between earnings and return of a firm for each period. The functions are presented in Table 2.

	Functions	
	Pre	Post
Firm A	1	1
Firm B	2	1

Table A2: Functions

In a **second step**, we calculate fitted returns by multiplying the earnings of a firm from one period with the function of firm A in that period and then with the function of firm B in that period. For example the fitted returns for firm A in the pre-adoption period are calculated with its earnings in that period (5) and its function in that period (1). We repeat this using earnings of firm A (5) and the function of firm B in that period (2). Thus we derive fitted returns of 5 and 10 for firm A in the pre-adoption period.

In **step three** we determine the difference between the two fitted returns of each firm as presented in Table 3.

	Fitted returns			
	Pre	Difference	Post	Difference
Firm A	$(1*5) = 5$	5	$(1*5) = 5$	0
	$(2*5) = 10$		$(1*5) = 5$	
Firm B	$(1*5) = 5$	5	$(1*10) = 10$	0
	$(2*5) = 10$		$(1*10) = 10$	

Table A3: Fitted returns

Step four follows after determination of differences between the fitted returns of each firm in pre- and post-adoption periods. We calculate the average between the differences of firm A and firm B for the pre- and post-adoption period in Table 4.

Average differences	
Pre	Post
5	0

Table A4: Average differences

The average differences are our measure of comparability. The higher the difference, the less comparable are the financial statements of the two firms. In our example the firms become more comparable in post-adoption periods as the difference between fitted returns decreases between the pre- and post-adoption period.

4 Empirical accounting comparability studies – a review

4.1. Introduction

International Financial Reporting Standards (IFRS) have become a widespread reporting language that is used by many countries around the world. According to Mary Barth (2008) the result “...*of truly global financial reporting would be one language of business, which will enhance comparability of accounting information*” (Barth (2008), p. 1160). Speaking of comparability, Stephen Zeff phrases a little more cautious “...*there has suddenly been a very great increase in global comparability in relation to what we had before, namely, every country using its own national standards...*” (Zeff (2007), p. 290). The comments illustrate that the concept of accounting comparability is elusive and accounting standards are not its only determinant.

The objective of this paper is to point out determinants and consequences of accounting comparability that have been identified by empirical research, to differentiate between existing notions of comparability and to summarize measures investigating these notions of comparability that evolved from empirical research. Hence, we adopt a broader perspective on comparability than prior reviews on this or related topics. Cole et al. (2009) limit their review on comparability measures to studies investigating the comparability of accounting practices with focus on characteristics of the different measures applied in these studies. In a similar vein the review of Baker and Barbu (2007) on accounting harmonization contains empirical studies measuring the comparability of accounting practices. Our review also comprises studies comparing accounting outputs instead of accounting practices that are means to prepare them. In addition, we discuss studies

measuring the consequences of accounting comparability. Although IFRS adoption is important for our review as it is a frequently used setting to investigate consequences of comparability, we do not limit the present review to studies investigating the effects of accounting comparability induced by IFRS adoption. The latter type of studies is discussed in the literature reviews of Soderstrom and Sun (2007) on voluntary IFRS adoption and Brüggemann et al. (2012) on mandatory IFRS adoption.

Comparability is an enhancing qualitative characteristic in the IASB's and FASB's common conceptual framework (IASB and FASB (2010)) and regulators promulgate IFRS adoption with the objective to increase comparability of accounting information (EC (2002)); (SEC (2008))). Both, standard setters and regulators expect positive effects of comparability on the usefulness of accounting information and the capital market. Our review documents the determinants and consequences of comparability identified by empirical research that are of importance for regulators, standard setters and practitioners. In addition, we summarize measures of comparability, document research trends and discuss future research opportunities that are relevant for researchers.

We document that enforcement is a major determinant of accounting comparability. A majority of studies also identifies effects of reporting incentives on accounting comparability. Empirical studies find that differences between sets of accounting standards cause differences in accounting outcomes which decrease when accounting standards become more similar. The move from different towards more similar or a single set of accounting standards has positive effects on comparability of accounting outcomes. However, studies

investigating effects of IFRS adoption on comparability do not support this finding.

Empirical studies investigating consequences of accounting comparability find positive effects on the usefulness of relative performance evaluations, transnational information transfers and foreign institutional investments. For the latter, results are mixed when measured from a macroeconomic perspective. Other studies find lower costs of equity, increased disclosures and a substitution of accrual earnings management with real earnings management when accounting comparability increases.

Surprisingly, many of the studies investigating consequences of accounting comparability use IFRS adoption as a setting, although results of determinants studies indicate that its effects on comparability of accounting outcomes is disputable. Hence, we suggest the further development and increased use of direct measures for comparability of accounting outcomes. Trends in empirical research show that recently more statistical measures for comparability of accounting outcomes have evolved and that first studies start using these measures to assess consequences of accounting comparability.

The paper consists of five sections. Section two defines the concept of accounting comparability and section three introduces common measures. The following section four summarizes and discusses the empirical findings of studies investigating determinants and consequences of accounting comparability. Section five provides a summary and describes the progression and trends in empirical research on accounting comparability.

4.2. Theory of comparability

In their common conceptual framework the standard setters IASB and FASB (2010) include comparability as an enhancing qualitative characteristic that is useful to investors for taking investment decisions. According to the framework comparability helps investors to “*identify and understand similarities in, and differences among, items*” (IASB and FASB (2010), QC21). The standard setters clearly distinguish comparability from uniformity meaning that different things look alike. Hence, we interpret comparability from the view of standard setters as a given economic event that is represented alike and different economic events that are presented dissimilar across periods or across firms which is in line with the interpretations of De Franco et al. (2011) and Schipper (2003). The standard setters further state that permission of “*alternative accounting methods for the same economic phenomenon diminishes comparability*” (IASB and FASB (2010), QC25), whereas the use of the same practice for the same items is not regarded as comparability but consistency. Hence, the standard setters promote the use of identical practices for the same economic events but regard this as means to improve comparability.

In the academic literature the concept of comparability has not yet been fully clarified and is understood in several ways. Two questions have to be addressed: What is compared and what is comparability? Table 1 provides a systematic overview of the following discussion and relates it to the views of standard setters, illustrating overlapping definitions.

Regarding the question what is compared, two perspectives can be adopted, an input-based perspective and an output-based perspective. Tay and Parker (1990) distinguish between comparisons of accounting practices

contained in accounting standards and comparisons of accounting practices applied by firms that are both conducted from an input-based perspective. However, the concept of comparability may also be understood in a broader sense to encompass an output-based perspective. From this point of view, accounting outcomes are directly compared instead of accounting practices contained in standards or applied that are means to prepare them. Comparability from an input-perspective can impact comparability from an output-perspective. If related to the common conceptual framework of the IASB and FASB, the input-based perspective assesses the degree of consistency that is regarded as a mean to improve comparability and the output-based perspective assesses what is regarded as comparability in the view of standard setters.

Table 1: System of types, measures and perspectives on comparability

Perspective	Input-based		Output-based
Definition in common conceptual framework of IASB and FASB	Consistency		Comparability
	Practices contained in standards	Practices applied	Accounting outcomes
Type of comparability	De jure comparability	De facto comparability	
Measurement approaches	Index-based		Index-based
		Statistical	Statistical
Studies (exemplary)	Garrido et al. (2002)	van der Tas (1988)	Barth et al. (2011); De Franco et al. (2011)
		Kvaal and Nobes (2011)	Gray (1980); Blanco and Osma (2004)

Having distinguished between comparisons of practices contained in accounting standards or practices applied and accounting outcomes, we address the question what comparability is. Concerning the input-based perspective, the exact notion of comparability can be debated. Two terms, “harmonization” and “standardization”, describe processes between different levels of comparability (Cole et al. (2009); Tay and Parker (1990))¹ but there is no common perception on what is the optimal level. Tay and Parker (1990) use the term “harmony” which can be understood as “*clustering of companies around one or a few available methods*” (Tay and Parker (1990), p.73). Increased clustering around accounting practices would be described as a process of harmonization. In addition, Tay and Parker (1990) also introduce the term “standardization” which comprises not just the concentration on one or few accounting practices but also the overall reduction of practices. Thus, the process of standardization results in uniformity which describes the use of a single practice (Cole et al. (2009)). However, this definition of uniformity is not fully congruent with the definition of standard setters who would define the use of a single practice as consistency. As discussed by Cole et al. (2009), if identical accounting practices are used to account for supposedly similar economic events, it can be debated whether these economic events are indeed similar. If they are not, it is possible that the use of a single accounting practice leads to a similar reflection of dissimilar events. Then, in the view of standard setters, there would be consistency in the principles used and uniformity in the reflection of economic events instead of comparability. Hence, there is room for discussion if the use of a single accounting practice improves comparability from the view of

¹ Tay and Parker (1990) further differentiate between accounting standards that are strict and less strict. The latter are accounting standards that leave some discretion to firms and, as a consequence, only lead to harmonization instead of standardization.

standard setters or instead meets standard setters' definition of uniformity. If the latter is the case, an appropriate level of alternative accounting practices used would rather lead to a similar reflection of similar events and dissimilar reflection of dissimilar events. This concentration on a few alternative practices is defined as harmony, a state between the existence of many alternative practices and uniformity in practices, by Tay and Parker (1990).

From an input-perspective two things can be compared: accounting practices contained in accounting standards and accounting practices applied. First, if accounting practices contained in accounting standards are compared, an increase in comparability from this perspective implies that the number of different alternative accounting practices contained in an accounting standard becomes smaller over time. In line with prior literature we refer to this as an increase in *de jure* comparability (e.g. Canibano and Mora (2000)). The reduction in alternative accounting practices is a process previously defined as standardization. An example is the reduction from three possible accounting practices for the measurement of inventories as the first-in-first-out, the last-in-first-out or the weighted average cost method to two possible accounting practices as the first-in-first-out or weighted average cost method. Alternatively, in many studies the adoption of a single set of accounting standards is defined as *de jure* comparability (e.g. Cole et al. (2009)). However, we stick to the first definition which is in line with the definition adopted by studies assessing *de jure* comparability (e.g. Garrido et al. (2002)).

Second, as sometimes different alternative practices are provided in accounting standards, firms that use identical accounting standards might still not apply identical accounting practices. Comparability of accounting practices used would only be attained if firms exercise options provided by a set of

accounting standards identically (Canibano and Mora (2000)). Hence, identical accounting standards are not a sufficient condition that implies comparability between accounting practices used. It is not even a necessary condition for the comparability of accounting practices used. For example, firms can use a common accounting practice although they follow different sets of accounting standards (Canibano and Mora (2000)). The use of a single accounting practice or increased concentration on few accounting practices is referred to as an increase in *de facto* comparability from an input-perspective. It is the consequence of a process previously defined as standardization or harmonization.

So far the definition of comparability focused on an input- perspective. From an output- perspective, generally, *de facto* comparability is assessed and accounting outcomes are compared directly. We follow the definition of De Franco et al. (2011) that “*for a given set of economic events, two firms have comparable accounting systems if they produce similar financial statements*” (De Franco et al. (2011), p. 2). The definition of comparability adopted by De Franco et al. (2011) is in line with the view of standard setters. Beuselinck et al. (2007) come up with a similar definition of comparability that is based on the view of regulators and prior research and defines “*reporting comparability as the ability of earnings to account similarly for alike transactions and differently for dissimilar transactions*” (Beuselinck et al. (2007), p. 3). De Franco et al. (2011) are among the first to develop a more statistical measure for financial statement comparability using regression analysis. Nonetheless, financial statements can hardly be compared in their entirety. Hence, many studies with an output-perspective as well as De Franco et al. (2011) concentrate on summary measures of financial statements. Summary measures

are, e.g., earnings or book values of equity. Theoretically, a comparison of summary measures requires financial statements prepared by one firm under two different accounting systems at one point in time, holding economic events constant. If two different firms are compared to each other, differences in summary measures might have been caused by differences in economic events instead of the accounting systems. Hence, depending on the research setting, output-based measures need to control for differences in economic events.

In summary we define comparability as follows: from an input-based perspective increased *de jure* comparability describes the reduction of alternative accounting practices contained in accounting standards and *de facto* comparability describes the increased clustering around a few accounting practices or the use of a single accounting practice for an economic event. Standard setters regard this as consistency, a mean that can improve comparability. Their definition of comparability is directly assessed in studies adopting an output-based perspective where *de facto* comparability describes identical accounting outcomes for a given set of similar economic events and dissimilar accounting outcomes for different economic events. Comparability from an input-based perspective does not imply but can support the improvement of comparability from an output-based perspective.

Regulators often promulgate the adoption of IFRS with the goal to improve comparability of financial statements (EC (2002); SEC (2008)). Although comparability is not explicitly defined, there is a strong indication that the definition of regulators is in line with the definition of standard setters. For example the SEC states in its roadmap that the greater amount of options contained in IFRS might “*reduce comparability of reported financial information, as different issuers may account or provide disclosure for similar*

transactions or events in different ways“ (SEC (2008), p. 135). The expected benefits from an enhanced comparability are a better ability of investors to allocate capital (SEC (2008)) or improved capital market efficiency (EC (2002)). Researchers expect that a similar reflection of economic events in accounting outcomes of different firms improves the ability of investors to process information and to assess firm-profitability and firm-risk. This will improve market liquidity and positively affect cross-border investments (e.g. Hail et al. (2010a)). Hail et al. (2010a) also mention the provision of proprietary information to competitors as a potential cost of increased comparability.

4.3. Measures of comparability

In the following we focus on the different measurement of comparability. As the perspective adopted, input-based or output-based, determines the comparability measure, we follow the discussion from the previous section and use it as guidance to structure the measures that will be introduced in the following. We distinguish between input-based measures that assess the level of consistency and output-based measures that assess the level of comparability as defined in by standard setters.

Input-based measures of comparability are mainly index-based and either test *de jure* or *de facto* comparability. In line with Cole et al. (2009) we further distinguish these measures into index-based measures and statistical measures. The differentiation between index-based measures and statistical measures is adopted as the notion of comparability can differ depending on which type of measure is used. Index-based measures assess comparability as an increase in the concentration of accounting practices adopted. By contrast, if

statistical measures are used, the notion of comparability can vary as the concentration of accounting practices used can be assessed but also distributions of accounting practices used by different groups of firms can be compared to each other. The latter is not necessarily in line with the definition of comparability from an input-based perspective as discussed in the previous section. This is because even if the distribution of accounting practices used between two groups of firms is identical they might use several alternative practices for the same items and there would be no concentration on practices at all.

Output-based measures focus on *de facto* comparability of financial statements. Again, we distinguish studies that use index-based methodologies and statistical measures. We adopt this structure not only for reasons of consistency. Output-based measures using indices require a very special setting in which one firm issues financial data at one point in time that is prepared under two different sets of accounting standards. The settings are special because no control for differences in economic events is required as identical events of one firm over one period are reported under two different set of accounting standards. This is different to the statistical measures that usually have to control for differences in economic events when comparing accounting outcomes. The different measures will be discussed in the following.

4.3.1. Index-based measures with an input-perspective

Very common measures of *de facto* comparability from an input-based perspective are related to the harmonization indices developed by van der Tas (1988). Harmonization indices assess the concentration of accounting practices applied by a sample of firms (van der Tas (1988)). Baker and Barbu (2007)

summarize research articles on accounting harmonization that have been published between 1965 and 2004. The review provides a tabulated overview of many empirical studies using harmonization measures. We briefly introduce the most commonly used measures as we regard them as early empirical comparability studies. Empirical studies on accounting harmonization became more frequent from 1990 onwards (Baker and Barbu (2007)), with the majority of the studies using index-based methodologies.

The simplest harmonization index is the Herfindahl (H-) index as a measure of concentration of accounting practices applied (van der Tas (1988)). The index increases in value the more commonly accounting practices are used.² However, the H-index has some limitations, especially when firms provide supplemental information in the notes that reflect the reporting under different accounting practices. Given this information a firm can report under multiple accounting practices that require more complex methodologies than the H-Index. Van der Tas (1988) suggests the C-index,³ a measure based on the H-index that can take the parallel application of two accounting practices into account.⁴

The H-index and the C-index have some limitations as they can only be used to assess comparability within countries or regions rather than comparability between countries. In cross-country comparisons both indices put more weight on larger countries with a larger number of firms. Hence, van der Tas (1988) suggests a third index, the I-index,⁵ that can be used to compare the concentration of accounting practices applied in one country to the

² See Table 2 for an illustrative example.

³ See Table 3 for an illustrative example.

⁴ The index is often used with a correction term as it leads to a double-counting of firms that report under multiple accounting practices (van der Tas (1988)).

⁵ See Table 4 for an illustrative example.

concentration in another country, independent of the number of firms assessed in each country. The index is also suggested by van der Tas (1988) for comparisons of more than two countries.

Weaknesses and merits of harmonization indices have been debated in prior literature (e.g. Aisbitt (2001); Krisement (1997), Taplin (2011)) and indices were amplified in several studies (e.g. Archer et al. (1995), Krisement (1997), Lainez et al. (1999), Morris and Parker (1998), Taplin (2004), Taplin (2011)). However, as all later versions of the indices are based on the three types introduced by van der Tas (1988) or combine their different characteristics, we limit our discussion to the H-, C- and I-index.

4.3.2. Statistical measures with an input-perspective

Tay and Parker (1990) suggest the chi-square test as measure of harmonization. The test does not necessarily assess the concentration of accounting practices used in or across countries. Instead the observed distribution of accounting practices applied is compared to an expected or uniform distribution. E.g. there would be increased comparability if the chi-square test shows that the distribution of observed accounting practices applied is significantly different from a uniform distribution (Tay and Parker (1990)). The chi-squared test can be used to test for harmonization that can be interpreted in several ways. Hence, results have to be considered with caution as illustrated in the three following examples.

First, the example of a cross-country comparison illustrates that increased comparability does not necessarily imply that firms of two countries move towards a single accounting practice (e.g. Herrmann and Thomas (1995); Parker and Morris (2001)). If two alternative accounting practices are applied

in two countries and each alternative is used by 50% of all firms in each country, these countries would be considered as comparable because the observed distributions of accounting principles and methods applied are not significantly different. If instead firms of one country were biased towards one accounting practice, for example, if 90% of all firms used one alternative and 10% used the other alternative, the two countries would not be considered as comparable. Hence, this test investigates whether countries are comparable regarding their diversity of different accounting practices applied within each country.

Second, interpretations of cross-country comparisons can be different as illustrated by the comparison conducted by Kvaal and Nobes (2010; 2011). They assess if there are national patterns of choices made in IFRS financial statements. Using chi-squared tests Kvaal and Nobes (2010; 2011) investigate if the observed distributions of IFRS practices differ significantly from the hypothesis that the distributions of practices are all the same across countries (Kvaal and Nobes (2010); Kvaal and Nobes (2011)). In this study the chi-squared test is used to identify significant differences in the distribution of IFRS practices across countries. The results of their chi-squared tests indicate that national patterns in the application of IFRS exist which contradicts the comparability of practices after adoption of IFRS.

Third, the chi-squared test can also be used for comparisons of distributions of accounting practices applied across periods (e.g. Canibano and Mora (2000); Emenyonu and Gray (1996)). For example, consider firms that apply alternative accounting practices with equal frequencies in earlier periods but migrate towards one accounting practice in later periods. Then, the chi-

squared test can be used to assess whether there is a significant bias towards one accounting practice over time, indicating increased comparability.

4.3.3. Index-based measures with an output-perspective

Earlier papers that adopt an output-based perspective assess *de facto* comparability using index-based measures. They are based on a comparability measure introduced by Gray (1980). She uses a measure to compare profits prepared under different sets of domestic accounting standards to a profit figure calculated by European analysts aiming to adjust for differences in accounting standards. This adjusted profit serves as a neutral figure and is used by Gray (1980) to determine the degree of conservatism in an accounting system. The larger a negative deviation from the neutral figure, the more conservative is the reported profit. However, the comparability measure can also be used to assess the deviation of two profit or equity figures prepared under different sets of accounting standards from each other. The smaller the deviation, the higher is the comparability between the reported profit figures. Hence, the measure was later renamed to “comparability index” by Weetman et al. (1998).⁶ The new name emphasizes its assessment of relative differences in accounting outcomes without being judgmental about the degree of conservatism in an accounting standard system (Weetman et al. (1998)). The index requires profit or equity figures that are prepared by one firm at one point in time but under two different sets of accounting standards. Its application is hence limited to very specific settings. Foreign firms that are listed in the US have to reconcile their profit and equity figures prepared under domestic GAAP to a profit and equity figure prepared under U.S. GAAP. Until the end

⁶ See Table 5 for an illustrative example of the comparability-index.

of 2007 IFRS profit and equity also had to be reconciled to U.S. GAAP amounts (SEC (2007)). The reconciliation of accounting data is provided in form 20-F of the American Securities and Exchange Commission (SEC). Data from 20-F reconciliations is used in several studies that apply the comparability-index (Blanco and Osma (2004); Cooke (1993); Haverty (2006) ; Street et al. (2000); Weetman et al. (1998)).

Data from reconciliations between financial statements prepared under two different sets of accounting standards is also used in other studies that do not use the comparability-index. Chen and Cheng (2007) assess 104 Chinese firms that prepare their financial statements in accordance with Chinese GAAP and IFRS. They compare line-item earnings differences between the two sets of accounting standards by scaling the absolute amounts of the line-items with total assets. The line-items are investigated between 1999 and 2003 and grouped into categories which distinguish line-items that have been subject to reforms from others. Thus Chen and Cheng (2007) assess if reformed accounting standards lead to smaller differences for the line-items affected. Harris and Muller (1999) analyze 89 non-US firms that apply International Accounting Standards and reconcile profits and equity to U.S. GAAP using form 20-F filings. They group reconciliation items into six categories and scale these categories with equity reported under IAS to show deviations from U.S. GAAP.

4.3.4. Statistical measures with an output-perspective

Aside from index-based measures, recently more statistical measures have been developed that assess *de facto* comparability from an output-perspective. De Franco et al. (2011) capture accounting comparability between

financial statements with the help of pricing multiples that are used to map accounting outcomes to economic outcomes or vice versa as suggested by Barth et al. (2011). Pricing multiples reflect the relation between economic outcomes and summary measures of financial statements. Summary measures of financial statements are, e.g. earnings (Barth et al. (2011) ; De Franco et al. (2011)) and book value of equity (Barth et al. (2011)). Economic outcomes are e.g. stock returns (Barth et al. (2011); De Franco et al. (2011)), stock prices and operating cash flows (Barth et al. (2011)). Pricing multiples are determined by regressions of firms' accounting outcomes that are prepared under a specific set of accounting standards on economic outcomes. For each set of accounting standards unique multiples can be determined. De Franco et al. (2011) calculate fitted earnings by multiplying firms' stock returns with the multiples. The fitted earnings are estimates that would have been expected under a specific set of accounting standards, given a firms' stock return. Thus for each individual firm different fitted accounting outcomes can be derived that can be assigned to different sets of accounting standards. The smaller the differences between these fitted accounting outcomes, the more comparable are the sets of accounting standards. In addition, De Franco et al. (2011) adopt an alternative measure of comparability, earnings co-movement, the covariation in earnings of two different firms out of the same industry. Compared to earnings comparability the difference in this measure is that just the covariation in earnings is assessed, without controlling for differences in economic events.

Lang et al. (2010) use the measures of De Franco et al. (2011) but interpret them partly different. They define comparability as similar accounting for similar events. However, Lang et al. (2010) argue that earnings co-movement tests might capture cases where dissimilar events are accounted for

similarly. An example is two firms, experiencing different economic events that report the same earnings figure. Although earnings covariance is high, earnings of both firms reflect the underlying economic events differently and are thus not comparable. Uniformity would rather be captured by earnings co-movement instead of comparability. Hence, Lang et al. (2010) clearly differentiate between earnings co-movement and accounting comparability and test how earnings co-movement and comparability are associated with a firms' information environment using analyst coverage, forecast accuracy, forecast dispersion and bid-ask spreads as proxies. Lang et al. (2010) find a positive association of a firms' information environment with earnings comparability and a negative association with earnings co-movement. They suggest that the negative association between earnings co-movement and a firms' information environment is a consequence of more uniformity in earnings.

Liao et al. (2011) test effects on comparability upon IFRS adoption using valuation models that assess the valuation usefulness of earnings and book values. They examine if earnings or book values prepared by firms from two different countries are priced equivalently by investors. This should be the case if IFRS adoption increases comparability from an output-perspective.

Beuselinck et al. (2007) test earnings comparability using associations between accruals and operating cash flows. Beuselinck et al. (2007) focus on accrual-cash flow associations and regard earnings comparability as dependent on timely loss recognition and the smoothing of income. Hence, they differentiate between associations of accruals with negative or positive cash flows. Also, Bradshaw and Miller (2008) assess earnings properties focusing on relations between accruals and cash flows. Accrual-cash flow relations are perceived as being dependent on the accounting standards applied. Hence,

comparability of accounting outcomes is affected if these relations differ across different sets of accounting standards (Bradshaw and Miller (2008)). Bradshaw and Miller (2008) investigate the correlation between accruals and cash flows, the variance of the absolute changes in earnings and the standard deviation of the residual from a regression of accruals on cash flows from the previous, current and following period that is based on Dechow and Dichev (2002).

Cascino and Gassen (2010) investigate comparability using three different sets of tests. They assess the variance of three balance sheet line items using a multivariate approach. The method is chosen as similar rules for recognition and measurement are expected to decrease the variance in line items across countries and hence increase comparability of the line items. In the second analysis the within-industry variance in seven earnings attributes is investigated. Earnings attributes are regarded as accounting outcomes and a declining cross-country variance of these outcomes indicates an increase in comparability of financial accounting information. In a subsample test, adopting an input-based perspective, the measurement and disclosure compliance to 8 different IFRS standards by German and Italian firms is investigated. The latter test is conducted to explain limited results of the prior comparability tests and regional, country- and firm-level factors and their effects on the compliance levels are assessed.

4.4. Empirical evidence

In the following we focus on studies measuring *de facto* comparability. Empirical studies assessing *de jure* comparability are scarce (Fontes et al. (2005); Garrido et al. (2002); Rahman et al. (1996)). Also, with widespread adoption of IFRS, investigations of *de jure* comparability across countries (Rahman et al.

(1996)) are less relevant as well as the assessment of convergence of national GAAP with IFRS (Fontes et al. (2005)). Also, the alternatives in accounting practices contained in IFRS have been steadily reduced. Garrido et al. (2002) show that *de jure* comparability of IFRS increased between 1973 and 2000 as the number of alternative accounting practices contained in accounting standards has been reduced.

Studies measuring *de facto* comparability from input-based or output-based perspectives provide empirical evidence giving insights into determinants and consequences of comparability. Determinants papers investigate the factors impacting and shaping accounting comparability. Consequences papers comprise studies investigating the impacts of accounting comparability.

4.4.1. Determinants of comparability

We distinguish studies investigating the determinants of comparability into three categories: first, studies investigating the effect of accounting standards on *de facto* comparability, second, studies investigating the influence of enforcement and third, studies investigating the impact of other reporting incentives on *de facto* comparability. The two latter are considered because variations in reporting incentives can shape reporting outcomes (Ball et al. (2000); Burgstahler et al. (2006); Holthausen (2003)) and without proper enforcement firms might not comply with accounting standards. Even if accounting standards are properly enforced, firms have still some discretion. If there is still discretion, reporting incentives can shape accounting outcomes and enforcement is just limiting the effects of reporting incentives (Hail et al. (2010a)). The determinants studies usually use direct measures of accounting

comparability that were introduced in the previous section. However, from some studies investigating the consequences of accounting comparability inferences on the determinants of comparability can be drawn.

4.4.1.1. Accounting standards

Most studies investigating *de facto* accounting comparability from an input-based perspective assess the effect of accounting standards on comparability of accounting practices. Aisbitt (2001) analyses four Nordic countries between 1981 and 1998 and finds increased comparability for 20 accounting practices induced by more comparable accounting standards but also other factors like, e.g., market forces or security market regulations. The latter finding is in line with Canibano and Mora (2000) who find increased comparability of accounting practices used by 85 international firms from the EU but without an increase in comparability between accounting standards during the periods 1991 and 1996. Murphy (2000) investigates the comparability of accounting practices of 16 Swiss companies that adopt IFRS between the years 1988 and 1995. In addition, the comparability of accounting practices of four control samples consisting of Swiss firms constantly following domestic GAAP and firms from Japan, the US and UK are analyzed. Murphy (2000) finds increased comparability of accounting practices for the Swiss firms adopting IFRS but also for the control firms. Hence, the increase in comparability of accounting practices cannot be attributed to the adoption of IFRS. Other studies adopting an input-based perspective investigate whether other factors as for example the alignment to international standards as U.S. GAAP or IFRS improve cross-country or within-country comparability of accounting practices, but find rather mixed results (Archer et al. (1995);

Emenyonu and Gray (1996); Lainez et al. (1999); Parker and Morris (2001)). However, the studies assess a rather voluntary alignment to comparable international accounting practices. This is different from an increased comparability of accounting practices induced by changes in national GAAP.

While the input-perspective focuses on effects of accounting standards on accounting practices, the output-perspective assesses comparability as defined by standard setters. Distinct effects of accounting standards on accounting comparability from an output-perspective are observed when firms prepare financial statements under two different sets of accounting standards at one point in time. The larger and dispersed the differences between the financial statements, the lower the accounting comparability. However, even in these special cases firms can use discretion to make financial statements prepared under one set of accounting standards more consistent with financial statements prepared under another set of accounting standards (Ashbaugh and Olsson (2002); Soderstrom and Sun (2007)).

The data provided in form 20-F reconciliations required by the SEC offers a rare opportunity to obtain financial statements prepared under two different sets of accounting standards by one firm at one point in time. Several studies have analyzed this data using comparability indices and investigated the effect of different accounting standards upon accounting outcomes directly: Street et al. (2000) investigate 20-F reconciliations from IFRS to U.S. GAAP prepared by 33 non-US companies between the years 1995 and 1997. They use the comparability index developed by Gray (1980) and find overall higher net incomes under IAS. However, differences between IAS and U.S. GAAP net incomes decrease in later periods. In a similar vein Blanco and Osma (2004) assess comparability between U.S. GAAP and IFRS using 20-F reconciliations

from a sample of 30 non-US companies between the periods 1995 and 2001. Specifically they investigate the frequency, the sign effect and the materiality of the reconciliation adjustments using the comparability index of Gray (1980). Their results support the findings of Street et al. (2000), as they find larger net incomes under IFRS but decreasing differences between U.S. GAAP and IFRS, although the frequency of reconciliation adjustments increases. This indicates increasing comparability between U.S. GAAP and IFRS financial statements over time which is also supported by the findings of Haverty (2006) who assesses comparability between U.S. GAAP and IFRS using a sample of 11 Chinese firms that are cross-listed on a US stock exchange. Using the comparability index of Gray (1980) he analyzes 20-F reconciliations of the firms between the years 1996 and 2002. However, on average he finds a higher net income under U.S. GAAP which contradicts the results of Street et al. (2000) and Blanco and Osma (2004). The contradiction might result from the small sample size of these studies.

Other studies compare domestic GAAP with U.S. GAAP or IAS using the comparability index of Gray (1980). Weetman et al. (1998) find larger differences between UK GAAP and U.S. GAAP in 1994 compared to 1988 and attribute this effect to diverging accounting standards and Adams et al. (1999) find higher profits under UK GAAP relative to U.S. GAAP but only few material reconciliation adjustments per firm in an item-by-item analysis of 20-F reconciliations. Hellman (1993) finds larger profits under Swedish GAAP relative to U.S. GAAP analyzing voluntary U.S. GAAP reconciliations between 1981 and 1990 and Adams et al. (1993) finds rather inconclusive results on the comparison of profits prepared under Finish GAAP and IAS. The studies have in common that they take advantage of the data provided in 20-F

reconciliations or even voluntary reconciliations from one accounting system to another. They provide direct insights into the main reconciliation items and the magnitude of differences between financial statements prepared under different sets of accounting standards. The studies are especially useful to investigate the development of differences between accounting outcomes over time and for the identification of the accounting issues that cause the largest differences. Although these studies suffer from a very limited number of observations and a probably biased sample of firms that are usually cross-listed and larger in size, the effect of differences in accounting standards on comparability of financial statements becomes evident. The studies investigating differences between financial statements prepared under U.S. GAAP and IFRS (Blanco and Osma (2004); Haverty (2006); Street et al. (2000)) show that convergence between accounting standards leads to smaller differences and thus increased comparability between financial statements. Thus the studies using comparability indices provide early empirical evidence for the impact of accounting standards on accounting comparability.

Bradshaw and Miller (2008) investigate whether the use of a single set of accounting standards leads to increased comparability of financial statements, assessing earnings properties mainly focusing on accrual-cash flow relations. They compare 178 voluntary U.S. GAAP adopters from 27 different countries with a group of US-firms following U.S. GAAP and a second group consisting of matched non-US firms applying the same domestic accounting standards as the transitioning firms before transition to U.S. GAAP. Bradshaw and Miller (2008) find increased comparability of earnings properties with the control firms applying U.S. GAAP after transition firms adopt U.S. GAAP. Comparability of earnings properties between the transition firms and the non-

US firms in post transition periods decreases, indicating that a single set of accounting standards increases accounting comparability.

Barth et al. (2011) investigate whether comparability between firms applying U.S. GAAP and firms transitioning from domestic accounting standards to IFRS increases. They investigate a sample comprising 17,714 firm year observations between 1992 and 2009 from 27 countries. As U.S. GAAP and IFRS are international accounting standards that are becoming more similar in the convergence efforts of the IASB and FASB, they expect an increased comparability after transition to IFRS. Barth et al. (2011) find that comparability between the two groups of firms significantly increases after adoption of IFRS, indicating that the convergence between U.S. GAAP and IFRS increases comparability of accounting amounts. In line with Bradshaw and Miller (2008), the results of Barth et al. (2011) indicate that increased similarities between two sets of accounting standards increases comparability of accounting outcomes.

Cascino and Gassen (2010) investigate changes in accounting comparability after mandatory adoption of IFRS. They conduct two analyses using a large sample which covers firms from 40 different countries, yielding 31,582 and 138,199 firm-year observations respectively. The third analysis is limited to a subsample consisting of German and Italian firms and comprises 405 firm-year observations. Cascino and Gassen (2010) find only limited evidence for increased comparability after mandatory IFRS adoption. They find decreasing variances in balance sheet items but no decreasing variances in earnings attributes across countries after IFRS adoption. Their evidence suggests only limited increases in accounting comparability induced by the introduction of a single set of accounting standards.

Also Lang et al. (2010) investigate earnings co-movement and comparability upon mandatory adoption of IFRS analyzing a sample of IFRS adopters consisting of 2,634 firm year observations from 26 countries between the periods 2001 and 2008. Lang et al. (2010) compare a matched and an unmatched control group of non-adopters to the IFRS adoption firms. Their findings indicate that earnings co-movement increases for IFRS adopters in post-IFRS adoption periods relative to the non-adopting control firms. Earnings comparability decreases relative to the non-adopters of IFRS in post-IFRS periods. The findings of Lang et al. (2010) and Cascino and Gassen (2010) cast doubt on the general notion that IFRS as a single set of accounting standards increases *de facto* comparability.

Liao et al. (2011) assess the valuation usefulness of earnings and book values to test for cross-country differences in comparability after adoption of IFRS. Their sample comprises French and German mandatory IFRS adopters yielding 1,153 and 1,236 observations respectively and is analyzed between the years 2006 and 2008. Liao et al. (2011) find that earnings and book values are priced equivalently across countries in 2006, the period after mandatory adoption of IFRS. This indicates comparable earnings and book values in 2006 which is contrary to the findings of Lang et al. (2010) and Cascino and Gassen (2010). However, comparability diminishes in subsequent periods. Pricing of book values becomes significantly different for French firms, relative to German firms, from 2007 onwards and pricing of earnings significantly diverges in 2008.

Generally, the results on studies investigating comparability upon adoption of IFRS indicate that accounting standards may not be the only and not a sufficient factor for accounting comparability.

4.4.1.2. Regulatory oversight

There are claims that a single set of accounting standards may not be sufficient to increase accounting comparability and that enforcement of accounting standards can be an important factor (e.g. Holthausen (2009); Schipper (2005)). The enforcement affects adherence to accounting standards and thus is a driver for variance in accounting outcomes (Holthausen (2009)).

Chen and Cheng (2007) find that differences between financial statement line-items of 104 Chinese firms preparing their financial statements in accordance with Chinese GAAP and IFRS significantly decreased after Chinese reforms imposed a stronger regulatory enforcement in 2001. They also show that not the differences in standards but the enforcement of standards has an effect on the magnitude of differences in line-items, providing evidence that weaker enforcement increases the variance in accounting outcomes across firms.

Bradshaw and Miller (2008) find that regulatory oversight can partly increase comparability for those items that are monitored. Also Barth et al. (2011) distinguish between firms located in countries with a high or low enforcement. Although they generally document increases in comparability between firms following U.S. GAAP and firms transitioning from domestic GAAP to IFRS, these are larger for IFRS adopters that are located in countries with a high enforcement.

Also studies measuring consequences of accounting comparability indirectly confirm the positive association between the degree of enforcement and accounting comparability. Florou and Pope (2009) find positive ownership effects attributed to changes in comparability upon IFRS adoption only for countries with strict legal enforcement and Wang (2011) fails to find positive

effects on transnational information transfers attributed to increased accounting comparability for countries with lax enforcement. DeFond et al. (2011) find that countries with a weak implementation credibility of accounting standards generally do not experience an increase in foreign mutual fund ownership as a consequence of improved comparability in post-IFRS adoption periods. Li (2009) observes decreases in costs of equity for mandatory IFRS adopters that are mainly driven by increases in disclosures and comparability only in strong legal enforcement environments.

Other consequences studies attributing observed effects only partly to changes in accounting comparability (Gordon and Shima (2011); Khurana and Michas (2011); Kim and Li (2011)) also find alleviating effects of weaker enforcement on US investments in foreign countries, the reduction of US home bias in US investors' stock portfolios and transnational information transfers.

4.4.1.3. Reporting incentives

Firms exploit discretion inherent in accounting standards to shape accounting outcomes dependent on individual reporting incentives. The following section summarizes studies that investigate the effect of incentives on accounting comparability.

Beuselinck et al. (2007) assess associations between accruals and cash flows of firms located in 14 EU member states. They analyze 25,110 firm year observations between the years 1991 and 2005. Results reveal larger cross-country differences for associations between accruals and positive cash flows in later periods of the analysis. However, timely loss recognition, across countries is more comparable in these periods. The results do not show a clear trend and indicate both, a decrease and an increase in accounting

comparability. Beuselinck et al. (2007) test the influence of reporting incentives as capital market pressure, debt levels and labor pressure on relations between accruals and cash flows. They find that timely loss recognition as well as earnings smoothing are negatively associated with capital market pressures and positively associated with labor pressure. Higher debt levels are positively associated with timely recognition of losses. As the incentives have an influence on accrual-cash flow relations they consequently have effects on accounting comparability.

Bradshaw and Miller (2008) investigate if capital market incentives affect the comparability of earnings properties between firms applying U.S. GAAP and firms transitioning from domestic to U.S. GAAP. Bradshaw and Miller (2008) use several proxies for capital market incentives. They expect firms with a larger number of different stock exchange listings and a dispersed ownership structure to benefit more from internationally recognized accounting standards. Financial statements audited by a Big 4 auditor are regarded as having a higher credibility. Growth-firms meet a greater challenge to raise debt-capital. Bradshaw and Miller (2008) expect these characteristics to have a positive influence on firm's incentives for a proper implementation of U.S. GAAP. They partition the sample into groups of firms with higher incentives and lower incentives and find increased compliance in disclosures for firms with higher incentives but do not find any effects on accounting outcomes. The results are contradictory to the findings of Beuselinck et al. (2007).

Cascino and Gassen (2010) investigate the measurement and disclosure compliance of German and Italian firms to 8 different IFRS standards. Cascino and Gassen (2010) argue that an increased level of compliance leads to an increased level of comparability. They identify different characteristics

influencing firms' incentives to comply with accounting standards. They find that the greater visibility of larger firms, the profitability of firms, the independence of the board, a Big 4 auditor, geographical aspects and early adoption have an influence on compliance. Cascino and Gassen (2010) provide evidence that different incentives among countries, regions and firms have an influence on financial accounting comparability. Also Liao et al. (2011) find that institutional factors drive managers' incentives to implement IFRS differently across countries. Assessing specific line items that are affected by estimates and choices of managers, they find that implementation of IFRS differs between France and Germany. They identify factors such as the legal system, religion, ownership structure and alignment of tax and financial reporting that potentially affect the different measurement and estimate choices in France and Germany. This is also in line with the findings of the input-based study of Kvaal and Nobes (2011) that indicate existence of national patterns in accounting practices under IFRS. They conclude that the use of accounting practices under IFRS is determined by accounting practices used before adoption of IFRS.

Wang (2011) distinguishes between countries with weak and strong reporting incentives based on an earnings management score developed by Leuz et al. (2003). She finds alleviating effects of weak reporting incentives on transnational information transfers assigned to improvements in accounting comparability.

4.4.2. Consequences of accounting comparability

We distinguish three categories of empirical studies investigating the consequences of accounting comparability. The first comprises studies

assessing the effects of comparability on the information environment of firms, followed by the second category of studies assessing the effect on investment allocation decisions on firm and country levels. The third category comprises studies investigating effects of comparability that are yet only scarcely assessed as effects on earnings management, cost of capital and on disclosures. A general challenge for the studies investigating the consequences of changes in accounting comparability is to disentangle effects resulting from comparability from effects induced by other factors. Generally, there are two types of studies. First, studies primarily investigating effects upon changes in the accounting standard system, e.g. IFRS adoption. We include these studies in our review if the observed effects are clearly attributed to changes in accounting comparability. Second, studies assessing consequences of accounting comparability that measure changes in comparability using direct measures of *de facto* comparability.

4.4.2.1. Information environment

This category comprises studies that analyze the effect of accounting comparability upon the information environment of firms. These studies measure effects on insiders' information advantages, transnational information transfers or the cost of information acquisition and information processing of users of financial statements, e.g. analysts.

Analyzing a sample comprising firms from 49 different countries between the years 1998 and 2004, Bae et al. (2008) assess whether foreign analyst following and foreign analysts' forecast accuracy are affected by differences in accounting standards. Specifically, they test the association between the number of foreign analysts following a firm and the GAAP

difference between the domicile country of the analysts and the analyzed firm. The tests are repeated with forecast accuracy of foreign analysts instead of foreign analyst following. Bae et al. (2008) find a negative impact of GAAP differences between two countries on the number of foreign analysts following and forecast accuracy of foreign analysts. The results of Bae et al. (2008) suggest that larger differences between accounting standards induce economic costs. Larger GAAP differences between two countries increase the information acquisition costs of analysts that outweigh their benefits of following a foreign firm.

Brochet et al. (2011) investigate changes in firms' information environment upon mandatory adoption of IFRS. Their sample comprises 2,616 yearly observations of firms that are listed on UK stock exchanges between the years 2003 and 2006. Brochet et al. (2011) exploit a special setting to isolate the effect induced by changes in comparability from other effects upon transition to IFRS. Brochet et al. (2011) perceive UK GAAP and IFRS as qualitatively similar and consequently attribute transition effects from UK GAAP to IFRS to changes in accounting comparability. According to Brochet et al. (2011) the change from UK GAAP to IFRS is a change between two accounting standard systems of high quality that convey the same level of information. Consequently a reduction in insiders' information advantages is attributed to improved accounting comparability as investors can better assess firm performances relative to other firms. Abnormal returns to insider stock purchases and analyst recommendation upgrades are used as proxies to capture insiders' information advantages. Using multivariate regression analysis Brochet et al. (2011) test if IFRS adoption has a negative effect on these abnormal returns. They find decreasing abnormal returns to insider stock

purchases and analyst recommendation upgrades, indicating reduced insiders' information advantages due to improved financial statement comparability upon adoption of IFRS.

Wu and Zhang (2010) assess the effect of mandatory IFRS adoption on the sensitivity of firms for relative performance evaluations. They investigate a sample consisting of European firms and 12,049 firm-year observations. Relative performance evaluations are used to assess a firms' performance in comparison to a foreign benchmark, i.e. its competitors. Relative performance evaluation mitigates distorting effects on firm performance induced by shocks in the economic environment if competitors are affected equally (Wu and Zhang (2010)). However, as Wu and Zhang (2010) state, shocks in the economic environment must be similarly reflected in earnings of the firm under evaluation and its benchmark. If the accounting treatment of economic events becomes more comparable, relative performance evaluations that are based on accounting data are applied more frequently (Wu and Zhang (2010)). Using CEO turnover as an outcome of relative performance evaluations, Wu and Zhang (2010) find an increased association with observed firm performances that are below the median performance of their foreign benchmarks in post-IFRS adoption periods. Wu and Zhang (2010) control for changes in accounting quality using a second benchmark group of domestic IFRS adopters. There is no change in the association of CEO turnovers and observed firm performances that are below the median performance of domestic benchmarks between pre- and post-IFRS adoption periods, mitigating the concern that results are driven by changes in accounting quality instead of accounting comparability. The evidence provided by Wu and Zhang (2010) suggests that the sensitivity of relative performance evaluations, i.e. the use of

information extracted from foreign competitors, is positively associated with increased cross-country accounting comparability. This supports the findings of Brochet et al. (2011).

Wang (2011) investigates if a firms' price and volume reactions to earnings announcements of foreign firms are stronger when identical or more similar accounting standards are applied. She analyzes firms from 46 countries comprising 26,349 firm-pair observations between the years 2001 and 2008. Wang (2011) argues that if financial statement information is more comparable, investors are able to better extract information from earnings signals of foreign peers. This information can be used for the valuation of firms out of the same industry that do not announce earnings. She finds significantly higher abnormal price and volume reactions to earnings signals of foreign peers for those firms that use the same set of accounting standards as their foreign peers. In addition, Wang (2011) finds significantly larger abnormal price and volume reactions for firms if accounting standards become more similar to the accounting standards used by their foreign peers. Wang (2011) assigns the increase in transnational information transfers to improvements in financial statement comparability. She controls for changes in reporting quality using a group of voluntary IFRS adopters that constantly follow IFRS over all analyzed periods. These firms are compared to a group of mandatory IFRS-adopters and a group of firms that constantly apply domestic GAAP. Testing the market reactions of the two latter groups to earnings signals of the voluntary adopters, she holds the quality of the earnings signals constant. Information transfer only increases for the mandatory IFRS-adopters in post-IFRS adoption periods. This supports the notion that the observed effects can

be assigned to changes in comparability rather than changes in accounting quality.

Kim and Li (2011) adopt a similar approach as Wang (2011) and investigate the effect of mandatory IFRS adoption on the transnational information transfer in the European Union. Using 3,501 firm pair observations they investigate firms from 20 different EU countries between the years 2002-2004 and 2006-2008. In contrast to Wang (2011) who focuses on changes in comparability, Kim and Li (2011) investigate the overall effect, i.e. changes in reporting quality and accounting comparability, of IFRS adoption on information transfers. However, by including both mandatory and voluntary IFRS adopters in their sample Kim and Li (2011) are also able to disentangle the effects of changes in reporting quality and accounting comparability. They test changes in the market reactions of voluntary or mandatory IFRS adopters to earnings signals of mandatory IFRS adopters to assess the overall effect of IFRS adoption on information transfers. Similar to Wang (2011) changes in market reactions of mandatory IFRS-adopters to earnings signals of voluntary adopters are exploited to assess effects of changes in comparability as the quality of the earnings signal is held constant. Results are compared to changes in market reactions of voluntary adopters to earnings signals of voluntary adopters. Thus, Kim and Li (2011) control for effects induced by other factors than mandatory adoption of IFRS. After finding only inconclusive results in their tests for overall effects of IFRS adoption, they focus on firms that are located in countries with strong enforcement mechanisms. Findings indicate that transnational information transfers increase for these firms in post-IFRS adoption periods. However, Kim and Li (2011) find only insignificant results when they disentangle this overall effect of IFRS adoption indicating that only

an increase in both, accounting quality and comparability induces the observed effects. Kim and Li (2011) find similar effects of more homogeneous accounting standards on transnational information transfers as Wang (2011) although only Wang (2011) can clearly assign the observed effects to increases in accounting comparability.

Similar to the studies of Kim and Li (2011) and Wang (2011), Campbell and Yeung (2011) test the effect of comparability on security pricing and also compensation contracting. In regard to security pricing an increased information transfer for firms in the same industry is expected if comparability improves, helping investors to better assess firm values upon earnings signals of competitors. In a similar vein as Wu and Zhang (2010), Campbell and Yeung (2011) assess if comparability leads to an increased accounting-based assessment of firm performances relative to performances of competitors. More specifically, they assess if accounting-based relative performance evaluations are increasingly used to determine executive compensation. They adopt an innovative approach to determine the degree of comparability between firms, using the statistical measure developed by De Franco et al. (2011). Comparability is measured directly from an output-perspective which is different from the studies of Wu and Zhang (2010) and Kim and Li (2011) who conclude an increase in comparability from IFRS adoption and isolate resulting effects from others. Campbell and Yeung (2011) find that comparability leads to a more efficient pricing of information derived from earnings signals of competitors into firms' stocks, indicating a positive association between comparability and intra-industry information transfers. However, they do not find an effect of comparability on the use of accounting-based relative performance evaluations. In regard to the latter finding, Campbell and Yeung

(2011) state that probably market-based relative performance evaluations are of higher relevance explaining the little effects of comparability on the use of accounting-based evaluations.

4.4.2.2. Investment allocation decisions

This section comprises studies that assess the effect of accounting comparability on foreign equity ownership or investment home bias of investors and foreign debt investments.

DeFond et al. (2011) investigate the relation between cross-border investments and increased accounting comparability after mandatory adoption of IFRS. They analyze a sample of EU firms from 14 different countries, comprising 5,460 firm-year observations between the years 2003 and 2007. DeFond et al. (2011) argue that benefits of increased comparability are realized only if IFRS are applied credibly and if the number of comparable industry peers following the same accounting standards increases sufficiently. The latter is captured by the number of industry peers following the same accounting standards prior to IFRS adoption relative to the number of industry peers following the same accounting standards after IFRS adoption. An earnings quality score developed by Leuz et al. (2003) is used as proxy for the credible application of IFRS. Foreign mutual fund ownership is used as proxy for cross-border investments. DeFond et al. (2011) find that foreign mutual fund ownership increases for firms that are located in countries in which IFRS is applied credibly and in which firms have a relatively larger increase in the number of comparable industry peers that use the same accounting standards. However, DeFond et al. (2011) do not document an increase in foreign mutual fund ownership for countries in which firms have only a weak increase in the

number of comparable industry peers. The findings of DeFond et al. (2011) suggest that benefits of comparability increase with the number of comparable industry peers.

Covrig et al. (2007) investigate the effect of voluntary adoption of IFRS on foreign mutual fund ownership between the years 1999 and 2002 in 29 countries. They find an increase in foreign mutual fund ownership for firms that voluntarily adopt IFRS. Although this effect of IFRS adoption is not clearly assigned to improvements in accounting comparability or quality, Covrig et al. (2007) additionally investigate regional funds that rely more on cross-country comparisons of firms and hence have a greater demand for increased accounting comparability than other funds. Covrig et al. (2007) find a relatively stronger positive association between foreign regional fund investments and IFRS adoption. This finding indicates benefits of increased accounting comparability on foreign mutual fund investments.

While Covrig et al. (2007) investigate voluntary IFRS adopters Florou and Pope (2009) investigate the effect of mandatory IFRS adoption on institutional ownership. Institutional ownership captures mutual fund investments as analyzed in Covrig et al. (2007) but also other institutional investors as e.g. pension funds or hedge funds. Florou and Pope (2009) find that the amounts invested and the number of institutional owners increases after transition to IFRS for countries with strict enforcement, low corruption and low reported earnings management. Florou and Pope (2009) assign this effect to the superiority of IFRS compared to other accounting standards rather than to an increased comparability of financial accounting data. However, they find that the increase of foreign institutional ownership is larger than the increase of domestic institutional ownership. This effect can be assigned to

comparability benefits of foreign investors as domestic investors lose their advantage in interpreting domestic GAAP. The finding supports the results of DeFond et al. (2011) and Covrig et al. (2007) indicating positive effects of improved comparability on institutional investments.

While the studies of DeFond et al. (2011), Covrig et al. (2007) and Florou and Pope (2009) investigate effects of comparability on investment allocation decisions from a firm-level perspective, the following studies investigate the effects adopting a macroeconomic perspective.

Khurana and Michas (2011) investigate changes in foreign equity holdings of US investors upon mandatory IFRS adoption by foreign countries. They investigate a sample comprising 85 countries of which 33 countries adopt IFRS between the years 2003 and 2007. IFRS are perceived as being more comparable to U.S. GAAP than other domestic accounting standards leading to comparability benefits for US investors and reducing their information processing costs. The tendency of investors to invest more extensively in domestic stocks is denoted as home bias. Khurana and Michas (2011) use two types of countries as benchmark for IFRS adoption countries, first, countries that constantly follow domestic accounting standards and second, countries that constantly follow IFRS over all analyzed periods. They find significant decreases in the US home bias for equity holdings of US investors for IFRS adoption countries in post-adoption periods relative to countries that constantly follow domestic GAAP and countries that constantly follow IFRS. Khurana and Michas (2011) attribute the observed effects to reduced processing costs of information for US investors that are partly induced by an increased accounting comparability.

Beneish et al. (2012) assess the effect of mandatory IFRS adoption on foreign equity and foreign debt investments. Analyzing a sample of 12 EU and 4 non-EU countries from 2003 to 2007 they find that foreign equity investments are not affected by IFRS adoption but foreign debt investments increase after adoption of IFRS. Beneish et al. (2012) test if this average effect induced by IFRS adoption can be assigned to an improvement in accounting comparability or quality. In order to disentangle these effects they distinguish if investing countries are either IFRS adoption countries or non-IFRS adoption countries. If investments from IFRS adoption countries increase, the observed effects are assigned to increases in accounting comparability and quality. If the investments from non-IFRS adoption countries increase the observed effects are assigned to an increase in accounting quality. Consequently, if Beneish et al. (2012) deduct the effect from non-IFRS adoption countries from effects from IFRS adoption countries they derive the effect induced by changes in accounting comparability upon adoption of IFRS. However, the difference between the observed effects is statistically insignificant suggesting that increases in comparability are either not existent or do not affect foreign debt investments. The findings of Beneish et al. (2012) are contrary to the findings of Khurana and Michas (2011). However, Khurana and Michas (2011) do not clearly disentangle effects of accounting comparability and other factors that might explain these mixed findings.

A closely related study by Gordon and Shima (2011) investigates 44 different countries and measures if US investments in a country increase when it adopts IFRS. Gordon and Shima (2011) generally do not find significantly larger US investments in countries that allow or mandate IFRS. In addition effects of the enforcement mechanisms and the legal system on the association

between US investments and the adoption of IFRS are assessed. Results indicate that US investments are only associated with IFRS adoption if countries have strong enforcement mechanisms which is in line with the results of Florou and Pope (2009).

Amiram (2009) finds that countries mandating IFRS have larger shares in equity portfolio holdings of foreign investors. He assigns this effect to a higher reporting quality and an increased familiarity of investors with IFRS. In addition he finds that investors located in countries that use IFRS invest significantly more in countries that use IFRS than investors located in countries that do not use IFRS. This result indicates that an increased accounting comparability has an influence on the investment decisions of investors. Still, the findings of Amiram (2009) are average effects that might also be induced by an increased reporting quality. Further results indicate that IFRS adopting countries experience a significant increase in foreign equity portfolio investments.

Lasmin (2011) finds that IFRS adoption is negatively associated with Foreign Direct Investment in 48 developing countries with weaker legal systems and enforcement mechanisms. However, like Amiram (2009) she does not disentangle the observed effects that could be induced by an increase in comparability or reporting quality. According to Lasmin (2011) the observed average effect can also be assigned to the fact that comparable standards do not necessarily lead to increased financial statement comparability if they are not properly implemented.

4.4.2.3. Earnings management, disclosure and cost of capital

This section comprises consequences studies that cannot be attributed to the prior studies. The studies investigate other effects of comparability such as impacts on earnings management, disclosure and cost of capital.

Sohn (2011) tests the effect of increased accounting comparability on earnings management activities. Investigating a sample comprising 32,211 firm-year observations from US firms between the years 1980 and 2009, he finds that accrual earnings management decreases when accounting comparability increases. Results also indicate that real earnings management is positively associated with an increase in comparability. The findings are in line with expectations as accrual earnings management becomes less likely if comparability between financial statements increases because it makes the accounting data more transparent. Managers shift to real earnings management activities as a substitute. Sohn (2011) uses the accounting comparability measure developed by De Franco et al. (2011) to assess comparability between firms and common earnings management measures to assess accruals-based earnings management and real earnings management. Sohn (2011) also investigates the influence of the information environment on the switch from accruals-based to real earnings management. He finds a limiting effect on the switch from accrual based earnings management to real earnings management for firms that have a good information environment. The same accounts for firms that are monitored by a “high quality” auditor. Overall the results indicate that financial statements become more transparent and real earnings management substitutes accrual earnings management with increasing comparability.

Li (2009) finds a reduction of cost of equity for mandatory IFRS adopters after transition to IFRS. She analyses a sample consisting of European firms, comprising 6,456 firm-year observations between the periods 1995 and 2006. Li (2009) measures the increase in comparability and disclosure for each country. The extent of additional disclosure is measured as the difference between prescribed disclosures under IFRS and required disclosures under previously used domestic GAAP. The change in comparability is measured as the amount of inconsistencies between IFRS and previously used domestic GAAP. Li (2009) finds that an increase in disclosure and comparability of financial accounting information has a decreasing effect on cost of equity.

Gong et al. (2009) investigate the association between earnings non-synchronicity and managers propensity to provide disclosures as well as the market reaction to these disclosures. The underlying assumption of the study is that earnings non-synchronicity increases the more variations in earnings can be explained by firm-specific factors (Gong et al. (2009)). Gong et al. (2009) mention that other factors can also have an influence on earnings non-synchronicity and cause differences among firms. One of these factors is differences in the accounting system. The approach adopted by Gong et al. (2009) neglects these factors and assumes that economic events are equally reflected in earnings of two comparable firms. Results indicate that increasing earnings non-synchronicity is associated with an increasing provision of voluntary disclosures by managers.

4.5. Summary and suggestions for future research

In recent studies, fewer analyses are conducted adopting an input-perspective on comparability. We suggest two reasons for this: First, measures

adopting an input-perspective often use index-based methodologies and compare a limited number of practices contained in accounting standards. Input-based measures that compare *de facto* comparability require extensive hand-collected datasets that are costly to generate. Accordingly, the sample size is limited. Second, input-based measures compare accounting practices contained in standards or accounting practices applied but neglect the actual outcomes. Comparable accounting outcomes for a given set of economic events is what standard setters regard as comparability, instead of comparable practices contained in accounting standards or comparable practices applied that are means to achieve that goal.

The input-based study of Aisbitt (2001) provides evidence that convergence of accounting standards increases comparability between accounting practices applied. Consequently, comparability from an output-perspective might be positively affected. Results of index-based studies adopting an output-perspective indicate this. They suggest that convergence of different sets of accounting standards reduces differences in accounting outcomes and hence increases *de facto* comparability (e.g. (Blanco and Osma (2004); Haverty (2006); Street et al. (2000))). The results are supported by findings of studies adopting an output-perspective using statistical measures. These studies find improvements in *de facto* comparability when accounting standards become more similar (Barth et al. (2011)) and also if a single set instead of different sets of accounting standards is applied (Bradshaw and Miller (2008)).

However, input-based studies do not provide evidence that adoption of IFRS increases comparability in accounting practices used (Kvaal and Nobes (2011); Murphy (2000)). Consequently, comparability from an output-

perspective might not improve upon adoption of IFRS. Indeed we document, that studies adopting an output-perspective investigating the effect of IFRS adoption fail to document increases in *de facto* comparability (Lang et al. (2010)) or find very limited effects on *de facto* comparability (Cascino and Gassen (2010); Liao et al. (2011)). The findings cast doubt on a positive association between the adoption of IFRS and an increase in *de facto* accounting comparability and suggest that accounting standards are not a sufficient factor in shaping accounting comparability.

Empirical evidence further suggests that regulatory oversight is an important factor determining accounting comparability. The findings of Chen and Cheng (2007) suggest that improved enforcement decreases differences between financial statements prepared under two different sets of standards. Studies adopting an output-perspective find positive effects of a stronger enforcement on accounting comparability (Barth et al. (2011); Bradshaw and Miller (2008)). Many studies investigating the consequences of accounting comparability only observe effects of accounting comparability if enforcement is strong (DeFond et al. (2011); Florou and Pope (2009); Li (2009); Wang (2011)), others find alleviating effects of accounting comparability if enforcement is lax (Khurana and Michas (2011)).

Aside from the enforcement of accounting standards, empirical research also investigates the effect of incentives on accounting comparability. Kvaal and Nobes (2011) who adopt an input-perspective find national patterns in the choice of accounting practices after adoption of IFRS, indicating that comparability from an output-perspective might also be affected by incentives. Beuselinck et al. (2007), in line with Cascino and Gassen (2010), identify incentives arising from capital market and labor pressures, board

independence, auditors as well as geographical aspects to have an impact on comparability from an output-perspective. Cascino and Gassen (2010) adopt an input- and output-perspective. They find differences in practices applied that are driven by incentives and conclude that these explain the limited comparability of accounting outcomes. By contrast, the findings of Bradshaw and Miller (2008) do not indicate an effect of capital market incentives on comparability of accounting properties.

For empirical studies adopting an output-perspective on comparability a clear trend is observed from index-based comparability studies analyzing very small samples (e.g. Adams et al. (1999); Blanco and Osma (2004); Hellman (1993); Street and Gray (1999); Weetman et al. (1998)) to more complex measures analyzing large-scale samples (e.g. Barth et al. (2011); Bradshaw and Miller (2008); DeFond et al. (2011)). There are currently no indications for a reversal of this trend. Early empirical studies assessing accounting comparability from an output-perspective often build on settings with firms providing financial data prepared under two different sets of accounting standards. The first index-based studies use data from 20-F reconciliations or voluntary reconciliations to compare domestic GAAP with international accounting systems as for example U.S. GAAP (e.g. Adams et al. (1999); Hellman (1993); Weetman et al. (1998)). With the widespread adoption of IFRS comparisons between domestic GAAP and international accounting standards become less important and index-based studies mainly focus on comparisons between IFRS and U.S. GAAP (e.g. Blanco and Osma (2004); Street et al. (2000)). The studies usually use hand-collected data and comprise a limited number of observations. A limitation of the studies is that results of the index-based studies might be distorted as mainly very large cross-listed

companies were analyzed that more or less self-select to report under U.S. GAAP in addition to domestic GAAP or IFRS. However, with the abandonment of the reconciliation requirements for foreign firms using IFRS by the SEC in 2007 (SEC (2007)), financial data prepared under U.S. GAAP and IFRS by one firm at one point in time is very scarce. Accordingly, studies conducting index-based comparisons from an output-perspective have become a descending branch of research.

Recent studies adopting an output-perspective come up with new statistical measures designed to grasp accounting comparability empirically. These measures are designed for large-sample tests focusing on summary measures derived from common databases (e.g. Barth et al. (2011); Bradshaw and Miller (2008); DeFond et al. (2011)). The new measures enable researchers to compare several accounting standards systems and to conduct extensive cross-country comparisons as well as a variety of sample partitions. However, there are also disadvantages as *de facto* comparability might be reflected in other factors that are not captured by the summary measures.

Literature investigating the consequences of accounting comparability is more prevalent than literature investigating its determinants. This seems surprising given the challenges in measurement and as observed effects must be clearly assigned to changes in accounting comparability.

We identify two types of studies measuring consequences of comparability. First, studies using direct measures to assess accounting comparability (Campbell and Yeung (2011); Sohn (2011)). Second, studies investigating the consequences of accounting comparability using special settings. The widespread adoption of IFRS is such a special setting. The notion that IFRS adoption leads to an increase in *de facto* comparability is prevalent in

most of the studies investigating consequences of changes in accounting comparability. Most studies investigate effects on accounting comparability induced by mandatory adoption of IFRS (e.g. Beneish et al. (2012); Brochet et al. (2011); DeFond et al. (2011); Li (2009)). Some studies also investigate effects induced by voluntary adoption of IFRS (e.g. Covrig et al. (2007)).

Evidence from the consequences studies suggests positive associations between accounting comparability and firms' information environment. Positive effects are observed for the usefulness of relative performance evaluations for investors (Brochet et al. (2011); Wu and Zhang (2010)) as well as transnational information transfers (Wang (2011)). However, the latter is found only in combination with improvements of accounting quality in the study of Kim and Li (2011).

There is compelling evidence that foreign institutional investments are affected by an increase in accounting comparability. DeFond et al. (2011) find a positive association of institutional investments with the number of comparable foreign industry peers and also Covrig et al. (2007) and Florou and Pope (2009) find positive effects of increased accounting comparability on foreign institutional investments. Evidence from a macroeconomic perspective is mixed. Khurana and Michas (2011) and Amiram (2009) find positive effects of improved accounting comparability on foreign equity holdings whereas Beneish et al. (2012) and Lasmin (2011) do not find any effects of increased accounting comparability on foreign debt and equity holdings or foreign direct investments. However, especially the study of Lasmin (2011) concentrates on developing countries with low enforcement that might limit *de facto* comparability.

The findings of the consequences studies are surprising as most of the studies find effects from changes in accounting comparability induced by IFRS adoption. Although there is evidence from determinants studies that a switch from different to a single set of accounting standards improves *de facto* comparability, determinants studies do not find improvements in *de facto* comparability upon adoption of IFRS. From this point of view the findings of consequences studies using IFRS-settings seem disputable. We offer three explanations for this conflicting evidence.

First, results of determinants studies investigating the impact of accounting standards on *de facto* comparability might be misleading as their measures capture *de facto* comparability only partially or not at all. Brüggemann et al. (2012) also document limited accounting effects but capital-market and macroeconomic effects upon mandatory adoption of IFRS and offer the strong focus on aggregated numbers as possible explanation. They suggest increased devotion to changes in comparability of other factors than summary measures provided by databases as aggregated numbers might not capture all changes in comparability. This suggestion offers a possibility for improvement of *de facto* comparability measures.

Second, the effects observed by consequences studies might be a result of other factors than a change in accounting comparability. Empirical studies investigating the consequences of accounting comparability find a variety of mechanisms to control for those factors. Often control groups are used to isolate the effects induced by changes in accounting comparability (Wu and Zhang (2010); Kim and Li (2011); Khurana and Michas (2011)). Brochet et al. (2011) argue that observed effects upon a switch between two qualitatively similar accounting standards can be assigned to changes in comparability and

DeFond et al. (2011) consider the change in the number of comparable industry peers. However, these research designs might not always be appropriate to isolate effects induced by changes in accounting comparability.

The third explanation is relevant for consequences studies using special settings such as, e.g., IFRS adoption to investigate changes in *de facto* comparability from an output perspective. A switch from different to a single set of accounting standards results in *de facto* comparability in some environments but this implication does not need to hold for all environments. Other determinants of accounting comparability such as enforcement and incentives might outweigh the effects and are often neglected. Then *de facto* comparability does not change when it is expected to change and effects induced by some determinants of accounting comparability are understated by empirical research.

Many of these concerns could be alleviated with further development and increased use of precise direct measures of *de facto* comparability adopting an output-perspective. The comparability measures will help to attribute observed effects to changes in accounting comparability. In addition, a measure adopting an output-based perspective that allows assessing *de facto* comparability supersedes indirect approaches, i.e. the need for events or settings from which a change in accounting comparability is concluded. Recently, studies start using the measure developed by De Franco et al. (2011) to assess consequences of accounting comparability (Campbell and Yeung (2011); Sohn (2011)). Research would benefit from further verification and development of more complex *de facto* comparability measures with an output-perspective that have recently evolved.

In addition the impact of comparability from an input-perspective on comparability from an output-perspective can be further assessed as it is highly relevant for standard setters. Empirical research can provide interesting insights if the use of alternative practices limits comparability from an output-perspective or is instead beneficial to a certain extent. Accordingly, standard setters can build on this information and eliminate or maybe even enhance options contained in accounting standards.

Another interesting setting providing future research opportunities is the current development in the US. A switch from U.S. GAAP to IFRS would offer interesting research opportunities. However, a phased-in adoption of IFRS is possible. In the latter case consequences of changes in accounting comparability would be observed over a longer time-period making it more challenging to control for other factors than accounting standards determining accounting comparability and to control for other factors with an impact on the effects assessed. However, a stepwise adoption of IFRS in the US would allow identifying accounting issues that especially limit accounting comparability and corresponding effects of their elimination.

4.6. References

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4.7. Appendix

Table 2: H-index

Name	Formula	Definition	Example
Herfindahl (H-) index (van der Tas (1988))	$H = \sum_{i=1}^n \rho_i^2$	<p>p = frequency of accounting practices n = number of alternative accounting practices</p> <p>Measures the concentration/relative frequency of applied accounting practices.</p>	<p>Costs of inventories can be measured with the first-in, first-out (FIFO) or the weighted average cost formula. If in a group of firms 50% percent use the FIFO method and 50% use the weighted average cost formula the H-index is calculated as follows:</p> $H = \sum_{i=1}^2 \rho_i^2 = 0.5^2 + 0.5^2 = 0.5$ <p>If instead 90% of firms use the FIFO method, the index has the following value:</p> $H = \sum_{i=1}^2 \rho_i^2 = 0.1^2 + 0.9^2 = 0.82$

Table 3: C-index

Name	Formula	Definition	Example
<p>C-index⁷ (van der Tas (1988), van der Tas (1992))</p>	$C = \frac{\sum_{j=1}^m (\alpha_j^2 - \alpha_j)}{(\sum_{j=1}^{m-1} \sum_{k=j+1}^m (\alpha_{jk}^2 - \alpha_{jk}))}$	<p>α_j = firms that apply accounting practice j α_{jk} = firms that apply practice j and k m = number of alternative practices n = total number of firms</p> <p>Measures the concentration/relative frequency of applied accounting practices but takes multiple reporting (i.e. the parallel application of two practices) into account.</p>	<p>Under IFRS investment property can optionally be measured at fair value or at cost with supplemental information providing fair values in the notes. Under U.S. GAAP investment property is measured at cost. If firm 1 measures investment property at fair value, firm 2 at cost and firm 3 at cost with disclosed fair values in the notes we derive two comparable pairs of firms: firm 1 and firm 3 as well as firm 2 and firm 3. The C-index is calculated as follows:</p> $C = \frac{2^2 - 2 + 2^2 - 2 - 0}{(3^2 - 3)} = \frac{2}{3}$

⁷ The formula presented is used if two alternative measurement methods are applied and has to be adapted if there are more alternative measurement methods as illustrated by van der Tas (1992).

Table 4: I-index

Name	Formula	Definition	Example
<p>I-Index (van der Tas (1988))</p>	$I = \sum_{i=1}^n (f_i^1 \times f_i^2)$	<p>f^1 = frequency of accounting practice i in country 1 f^2 = frequency of accounting practice i in country 2 n = number of accounting practice s</p> <p>Compares the concentration/relative frequency of accounting practices applied in one country to the concentration/relative frequency in another country without weighting the countries.</p>	<p>Costs of inventories are measured with the first-in, first-out (FIFO) or the weighted average cost formula in two different countries. 60% of firms use the FIFO method and the other 40% of firms use the weighted average cost formula in both countries. The I-index is calculated as follows:</p> $I = 0.6 \times 0.6 + 0.4 \times 0.4 = 0.52$

Table 5: Comparability-index

Name	Formula	Definition	Example
Comparability-index (Gray (1980))	$\text{Comparability index} = 1 - \left(\frac{NI_{US} - NI_{IFRS}}{ NI_{US} } \right)$	$NI_{US} =$ net income reported under one set of accounting standards (here U.S. GAAP) $NI_{IFRS} =$ net income reported under a second set of accounting standards (here IFRS) The index measures the deviation of a reported profit figure prepared under one set of accounting standards from the profit figure prepared under a second set of accounting standards. It has a neutral value of 1.	A firm prepares its consolidated financial statements under IFRS and is listed on a US stock exchange. Before 2008 this firm had to reconcile its profit to a profit figure prepared under U.S. GAAP. If IFRS profit is 100 and U.S. GAAP profit 75 the index is calculated as follows: $1 - \left(\frac{75 - 100}{ 75 } \right) = 1.33$ The value above the neutral value of 1 indicates a higher profit under IFRS and a deviation of 33%

5. Conclusion

This thesis addresses the decision usefulness of financial statements that is an important concept in financial reporting. I analyze the effects of a change in accounting standards on two factors that influence the decision usefulness of financial accounting information: informativeness and comparability of financial statements. Informativeness measures the ability of financial statements to capture or summarize information. Comparability means that similar economic events are reflected similarly in accounting outcomes and different economic events are reflected dissimilar.

Specifically, I investigate the effects upon transitions from U.S. GAAP to IFRS. Both accounting standard systems pursue the objective to convey financial reporting information to investors that is decision useful. Hence, the transitions from U.S. GAAP to IFRS provide an interesting setting to analyze the effects of differences between the accounting standard systems on informativeness and comparability of financial statements.

For the informativeness test a difference-in-differences setting is applied that isolates effects induced by a change in accounting standards. Thus, other factors that potentially affect informativeness as e.g. accounting incentives are hold constant. Full sample test results do not indicate a change in earnings informativeness for the entire sample of firms that transition from U.S. GAAP to IFRS. Firms that transition from U.S. GAAP to IFRS are required by IFRS 1 to provide a reconciliation of book value of equity and incomes prepared under previously applied accounting standards to book value of equity and incomes prepared under IFRS. Results of subsample tests suggest that informativeness increases for firms with large de facto differences between U.S. GAAP and IFRS incomes at the time point of first-time IFRS adoption.

This result indicates that financial statements capture or summarize information better in post-IFRS adoption periods for firms that have larger differences in incomes prepared under U.S. GAAP and IFRS at first-time adoption of IFRS. Given that the standard setters IASB and FASB converge their accounting systems, the results of the full-sample test indicate that overall only few differences between U.S. GAAP and IFRS remain that impact informativeness only marginally. However, if the impact of the accounting standard change on accounting outcomes is larger, informativeness improves.

Also the comparability test is conducted in a difference-in-differences design. Financial statements of the transitioning firms are compared to financial statements of firms that constantly follow IFRS. Results indicate that comparability increases when all firms follow IFRS accounting standards relative to pre-adoption periods when one group of firms follows U.S. GAAP and the other IFRS. However, transition effects induced by the use of exemptions provided by IFRS 1 and the covert option for capitalization of intangible assets of IAS 38 lower the comparability of book value of equity in post-IFRS adoption periods. Comparability of book value of equity is not affected if firms do not use exemptions provided by IFRS 1 and the covert option for capitalization of intangibles.

The third study documents findings of empirical comparability studies. Comparability can be investigated from two perspectives: an input-perspective and an output-perspective. The definition of comparability from an output perspective is in line with the IASBs' and FASBs' views on comparability. It is defined as the similar representation of similar economic events and dissimilar representation of different economic events. Comparability from an input-perspective assesses if the same principles are contained in accounting

standards or applied by firms. A variety of measures has evolved in comparability studies to assess comparability from the two different perspectives. The most commonly are introduced in the study. Studies investigating the determinants of comparability show that, aside from enforcement and incentives, the adoption of a single set of accounting standards or the convergence between two different sets of accounting standards have positive effects on comparability from an input- and output-perspective. However, results of studies investigating comparability from input- and output-perspectives after IFRS adoption are ambiguous. Many studies assessing the consequences of comparability use special settings from which changes in comparability are concluded. Surprisingly, often IFRS adoption is used as such a setting although determinants studies do not clearly indicate improvements in comparability in post-IFRS adoption periods. We suggest an intensified use of direct measures of comparability from an output-perspective in consequences studies that will help to alleviate current limitations inherent in these studies.

In summary results of the studies show that a change from U.S. GAAP to IFRS is likely to have positive effects on decision usefulness of financial statements, especially for firms that show larger de facto differences between financial reports prepared under U.S. GAAP and IFRS.

As, to the best of my knowledge, the German setting is the only one that provides a sufficient number of observations of U.S. GAAP to IFRS transitions, the resulting effects from U.S. GAAP to IFRS transitions are widely unexplored. This thesis investigates effects of transitions from U.S. GAAP to IFRS on two factors influencing decision usefulness of financial statements: informativeness and comparability. Future research could

concentrate on resulting capital market effects upon transitions from U.S. GAAP to IFRS, as e.g. costs of equity or debt capital, foreign ownership, or effects on analyst forecasts or credit ratings. But also contracting effects could be investigated, as e.g. effects on management compensations, dividends, regulatory consequences and taxation.

The empirical studies contained in this thesis investigate a German sample of firms that transitioned from U.S. GAAP to IFRS. Currently the US SEC considers mandatory adoption of IFRS in the United States. If IFRS are adopted in the US this will offer interesting research opportunities. Effects on decision usefulness could be further investigated and also consequences on the capital market as well as macroeconomic and contracting consequences.

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Affirmation – Statutory Declaration
According to § 10 No. 7 of the Doctoral Studies' Guide Lines
(As Amended on the 5th March 2008)

I hereby declare, that the

Dissertation

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Further persons have not been involved in the preparation of the presented dissertation as regards contents or in substance. In particular, I have not drawn on the non-gratuitous help of placement or advisory services (doctoral counsels / PhD advisors or other persons). Nobody has received direct or indirect monetary benefits for services that are in connection with the contents of the presented dissertation.

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