Relative Effects of IFRS Adoption and IFRS Convergence on Financial Statement Comparability

Stephen Lin*
Florida International University

William Riccardi
University of Albany, SUNY

Changjiang (John) Wang
University of Cincinnati

Corresponding author:

Stephen Lin
School of Accounting
College of Business
Florida International University
Miami, FL 33199
Email: lins@fiu.edu

We are grateful for the valuable comments from two anonymous reviewers, Ole-Kristian Hope, Katherine Schipper, Grace Pownall, Andrew Leone, Wayne Thomas, Ervin Black, Agnes Cheng, Jennifer Ho, Richard Morris, Ram Venkataraman, Shiheng Wang and workshop and conference participants at Florida International University, University of Texas at Arlington, University of Oklahoma, Hong Kong Polytechnic University, National Cheng Kung University, and National Cheng Chi University.

Relative Effects of IFRS Adoption and IFRS Convergence on Financial Statement Comparability

ABSTRACT

One of the primary objectives of both adoption of International Financial Reporting Standards (IFRS) and convergence between IFRS and U.S. Generally Accepted Accounting Principles (U.S. GAAP) is to increase financial statement comparability. Using a unique setting in Germany, we compare the effectiveness of these two methods in achieving this desired outcome. Our empirical tests show that both adoption and convergence led to an increase in comparability. However, difference-in-differences tests that examine the relative effects of these two regulatory efforts suggest that, in general, adoption of IFRS does not consistently provide a significant incremental increase in financial statement comparability beyond what is achieved through convergence. The findings of this study should be of interest to regulators and standard-setters as they assess alternative methods of achieving accounting standard globalization.

Relative Effects of IFRS Adoption and IFRS Convergence on Financial Statement Comparability

1. INTRODUCTION

Using a unique setting in Germany as a natural experiment, this study examines the respective and relative effects of a mandatory adoption of International Financial Reporting Standards (IFRS) from U.S. Generally Accepted Accounting Standards (U.S. GAAP) and the convergence between U.S. GAAP and IFRS on financial statement comparability (hereafter, "comparability").

This study is motivated by the two approaches used by different countries as they aligned their domestic accounting standards with IFRS over the last decade. Countries such as the member states of the European Union (E.U.) directly switched to IFRS from their domestic accounting standards in 2005 (hereafter, "adoption") while other countries, such as U.S., Japan and China, chose to gradually converge their national accounting standards with IFRS (hereafter, "convergence").[1] Prior research comparing the benefits of adoption versus convergence is limited.

The U.S., the largest economy in the world, has included both adoption and convergence as potential strategies to achieve international accounting harmonization. The U.S. has been converging U.S. GAAP with IFRS since the Norwalk Agreement (2002). The U.S. has also considered whether a mandatory switch to IFRS from U.S. GAAP would be beneficial to publicly-listed firms in the U.S. (SEC's Roadmap, 2008; SEC's Work Plan,

[1] Note, however, that the approach taken by individual countries may differ with respect to convergence. For example, convergence as referenced within this study—between U.S. GAAP and IFRS—has resulted in changes to both sets of standards. Conversely, China has chosen to adopt certain IFRS so far but has promised to fully converge Chinese GAAP to IFRS in the near future. There has been convergence between IFRS and Japanese GAAP since 2005. Certain qualified Japanese companies were permitted to use IFRS beginning in 2010.

2010, 2011, 2012) following the E.U. adoption of IFRS in 2005. Since the decision of adopting IFRS in the U.S. has been pending for many years and the progress towards converging standards has begun to diminish in recent years, the ongoing policy deliberation about the alignment between IFRS and U.S. GAAP appears to be much more complicated and controversial than in other countries. There is no systematic evaluation and analysis about the relative costs and benefits of adoption and convergence so far, most likely driven by the lack of data since no U.S. companies have adopted IFRS.

Both adoption and convergence share the same goal of developing a single set of high-quality global accounting standards. One important aspect of the intended benefits of both approaches of alignment with IFRS is to increase the comparability of financial statements prepared by firms located in different countries (The Norwalk Agreement 2002; SEC Roadmap 2008). Previous studies (e.g. Yip and Young, 2012; Cascino and Gassen, 2015) have examined the extent to which adoption affects comparability across different countries. However, little is known about the effect of convergence on comparability and whether the effects of adoption and convergence on comparability might differ. An analysis on the relative benefit of adoption and convergence would help regulators and standard-setters as they assess alternative methods of achieving accounting standard globalization.

Intuitively, one might expect that adoption would eliminate any accounting differences and significantly improve the comparability between firms following U.S. GAAP and others that report under IFRS. However, there are several reasons why IFRS adoption may not necessarily improve comparability. First, since IFRS are more principles-based, the comparability of financial statements reported under IFRS could be adversely affected by managerial discretion (Schipper 2003). Second, since the IASB does not have

authority to impose compliance with IFRS within individual countries, there are significant international variations related to IFRS implementation and practices (Nobes, 2006; Nobes, 2011; Cascino and Gassen, 2015). In other words, lack of enforcement and different versions of IFRS could significantly reduce comparability. Finally, due to the differences in institutional and economic factors across countries, accounting standards alone may not necessarily result in comparable accounting outcomes (Ball 2006; Holthausen 2009; Cascino and Gassen 2015).

On the other hand, the convergence projects between the FASB and IASB aim to make their existing financial reporting standards fully compatible as soon as is practicable and to coordinate their future work programs to ensure that once achieved, compatibility is maintained (The Norwalk Agreement, 2002). However, many criticized that the process of convergence has been slow and ineffective, with some convergence projects being completed successfully while others were completed with limited success. There are also projects that were either discontinued or resulted in diverged standards in recent years. Henry, Lin, and Yang (2009) find that the convergence projects have reduced the accounting differences between IFRS and U.S. GAAP, but significant differences remain.

Adoption and convergence are different in many aspects. Adoption immediately eliminates any accounting differences and therefore could cause significant changes in accounting practices in a very short period of time. Convergence, however, only removes major accounting differences and allows certain differences to exist, which would have a less significant impact on accounting practices. In theory, comparability achieved through convergence would be no different from adoption if all accounting standards were converged over a relatively short period of time. Moreover, convergence may result in

changes to either or both sets of accounting standards, whereas adoption replaces one set of standards with the other. Therefore, it is unclear ex ante whether adoption would lead to a greater increase in comparability than convergence.

The unique environment of the German market allows us to analyze these issues.[2] Prior to the adoption of IFRS by the E.U., the German government permitted firms to prepare their financial statements in accordance with German GAAP, U.S. GAAP or IFRS. After the mandatory adoption of IFRS by the E.U. in 2005, all German firms began to report under IFRS.[3] Therefore, the German market provides a natural setting where there are firms that switched to IFRS from U.S. GAAP and other firms that continued to apply IFRS throughout our sample period of 2002-2010. In addition, German regulators concurrently introduced a new enforcement regulation not only to support the implementation of IFRS but also to ensure full compliance (Daske, Hail, Leuz, and Verdi 2013; Christensen, Hail, and Leuz 2013), which renders the adoption of IFRS in Germany more credible.

Following prior research, this study employs various pair-based measures to operationalize comparability. To do so, we identify a set of German firms that switched from U.S. GAAP to IFRS (hereafter, "German U.S. GAAP firms") and match these firms with German firms that applied IFRS throughout the sample period (hereafter, "German IFRS firms"). We attribute any detected changes in the comparability between these paired firms from the pre- to post- adoption period to adoption. We then use the same German

[2] We are unable to use other countries' data to investigate these questions due to a lack of the required institutional setting and insufficient number of observations. We provide more detailed discussion in footnote 8.

[3] When firms cross-listed outside of Germany, they were permitted to delay adoption of IFRS until no later than 2007, including those firms cross-listing in U.S. capital markets. After we impose the sample selection criteria, no remaining firms are cross-listed on U.S. exchanges.

IFRS firms and form a second matched sample with U.S. firms that reported consistently under U.S. GAAP.[4] Since these two types of firms did not undergo a switch in their accounting standards during the sample period, we attribute any changes in the comparability between these firms from the pre- to post- adoption periods to convergence. We then employ a difference-in-differences regression model to examine whether adoption provides an incremental effect on comparability beyond convergence after controlling for certain firm characteristics and a potential self-selection bias.

Our findings suggest that comparability between the matched German U.S. GAAP and IFRS firms improves after the mandatory adoption of IFRS in Germany in 2005, which confirms this expected benefit of IFRS adoption. We also find that comparability between the matched German IFRS and U.S. firms improves over the same time period, which also supports the intended benefit of ongoing convergence projects between the Boards. However, our difference-in-differences regression results suggest that adoption does not consistently provide a significant incremental increase in comparability beyond continued convergence. These findings are robust to various empirical specifications and after controlling for the effect of the new enforcement regulation.

To complement the above empirical findings, we have performed three additional tests that involve hand-collection of financial statement data. First, following previous studies (e.g. Street et al. 2000; Haverty 2006; Henry et al. 2009), we measure the "adoption effect" by the scaled accounting differences in net income and shareholders' equity between IFRS and U.S. GAAP. In theory, adoption should immediately eliminate any

[4] In supplemental tests, we also consider all the German IFRS firms and match them with U.S firms to offer a broader representation of the convergence effect. We continue to document improved comparability and discuss these results more fully in later sections.

accounting differences if companies fully comply with IFRS. We find that a switch to IFRS from U.S. GAAP in Germany would reduce accounting differences in net income and shareholders' equity by approximately 5% and 3%, respectively, based on the reconciliation disclosure provided by a sample of German U.S. GAAP firms, which is economically material. Second, we follow Cascino and Gassen (2015) to investigate the extent to which the German U.S. GAAP firms included in our sample are in compliance with IFRS in the post-adoption period.[5] Specifically, we investigate the average levels of both measurement and disclosure compliance as required by IFRS in the areas that have been identified as key accounting differences. We find that average measurement and disclosure compliance rates are high except for two disclosure items within pension and post-employment benefits. Third, we measure the "convergence effect" by comparing the average measurement and disclosure compliance rates for those completed convergence projects up to 2010 between a sample of German IFRS firms and matched U.S. firms. We find that the average measurement and disclosure compliance rates are high for both samples of firms and are generally comparable between them, except for limited items in segment reporting and business combinations. In sum, the additional validation tests complement our earlier empirical findings that both adoption and convergence increase comparability given the high level of compliance with IFRS in Germany. This finding is also consistent with the fact that Germany concurrently introduced a new enforcement regulation to ensure full compliance with IFRS in 2005.

This study offers several contributions to the literature. First, previous studies (e.g., Barth et al. 2012; Yip and Young 2012; Cascino and Gassen 2015) find that a switch to

[5] Using firms in German and Italy, Cascino and Gassen (2015) find that adoption of IFRS from local GAAP *per se* does not, rather high-level compliance with IFRS increase accounting comparability.

IFRS from non-U.S. domestic accounting standards generally increases comparability. Our results show that comparability also increases when firms switched to IFRS from U.S. GAAP, despite skepticism that such a shift in the reporting regime may not necessarily lead to more comparable reporting. Second, this study is the first to investigate the respective and relative effects of adoption and convergence on comparability using a unique setting in Germany. Our results suggest that both adoption and convergence improve comparability but adoption may not be necessarily more beneficial than convergence in achieving greater comparability. Moreover, there remains a possibility that financial reporting quality could decline following a switch from U.S. GAAP to IFRS (Lin, Riccardi, and Wang 2012). We believe that our findings provide timely evidence as countries and world market and accounting regulators evaluate alternative venues to achieve accounting standard globalization.

Our study is not without caveats. First, the sample size is relatively small because there are a limited number of German firms that reported using U.S. GAAP before adopting IFRS. Second, although the unique setting in Germany may circuitously reflect a potential setting in the U.S. if the U.S. decides to switch to IFRS, the results of this study may not have direct implications for the U.S. Moreover, this study compares the effect of a "full" adoption of IFRS with a "partial" (ongoing) convergence between U.S. GAAP and IFRS due to a limited time frame and data availability. The outcome could be different if U.S. regulators continued toward achieving "full" convergence, such as the strategy of convergence with IFRS used by Canada. Additionally, the reporting and regulatory environment in Germany is substantially different from the U.S. Finally, the decision between whether or not the U.S. should adopt IFRS and, similarly, whether or not

convergence should continue are influenced by a variety of factors, including control over the standard-setting process, compliance costs, and political issues which are unrelated to the actual or perceived improvements in the financial reporting process.

2. INSTITUTIONAL BACKGROUND

2.1 Adoption and Convergence and their impacts on Comparability

Of the 140 jurisdictions whose profiles have been posted by IASB,[6] 116 jurisdictions (83%) require IFRS for all or most domestic public companies. These jurisdictions, such as the E.U. member states, directly switched to IFRS from their domestic accounting standards over the last decade. However, the remaining 24 jurisdictions[7], such as Japan, China, and the U.S, have been converging their domestic accounting standards with IFRS. The goal of both adoption and convergence is to develop a single set of high-quality global accounting standards that could be used for both domestic and cross-border financial reporting as a means to increase comparability. The FASB (2014) states that seeking more comparable global accounting standards is consistent with its core mission. It also argues that investors, companies, auditors, and other participants in the U.S. financial reporting system will benefit from the increased comparability that can result from the closer alignment of standards used internationally.[8] The FASB also believes that more comparable standards have the potential to reduce costs for both users and preparers

[6] Please refer to http://www.ifrs.org/Use-around-the-world/Documents/Financial-Reporting-Standards-World-Economy-June-2015.pdf.

[7] These jurisdictions include Bermuda, Bolivia, Cayman Islands, China, Egypt, Guatemala, Guinea-Bissau, Honduras, India, Indonesia, Japan, Macao, Madagascar, Nicaragua, Niger, Panama, Paraguay, Saudi Arabia, Suriname, Switzerland, Thailand, United States, Uzbekistan, and Vietnam.

[8] The FASB further states that greater comparability is achieved through (1) developing high quality standards, (2) actively participating in the development of IFRS, and (3) enhancing relationships and communications with other national standard setters.

of financial statements and make worldwide capital markets more efficient.

In an attempt to achieve the goal of improved comparability, the SEC and FASB have worked together with the IASB over the last decade to converge U.S. GAAP and IFRS through several major and short-term joint projects to remove the major differences between the two sets of standards. Appendix A shows a list of the joint projects and their progress between the Boards. Moreover, beginning in 2007, the SEC allowed foreign registrants to report their financial statements using IFRS without reconciliation to U.S. GAAP, signaling the acceptance of IFRS as sufficiently high quality and indicating that they have become reasonably comparable with U.S. GAAP.

A Roadmap (SEC 2008) was issued to provide the timeline for the potential adoption of IFRS in the U.S. if the proposed seven milestones were achieved. However, no decision has been reached so far regarding whether and/or when U.S. firms may be permitted or required to prepare their financial statements in accordance with IFRS (SEC 2012). The delay in reaching a decision has been due, in part, to inconsistent views from the SEC on the potential benefits of IFRS adoption and resistance from the stakeholders in the U.S.[9] Moreover, the reluctance to adopt IFRS in the U.S. could be driven by the potential for the FASB to relinquish control over accounting standard-setting and give such authority to a foreign international body located in London (Bogopolsky, 2015).[10]

Academics have also expressed their opinions on both sides of the debate. Bradshaw et al. (2010) propose that continued convergence between the Boards is

[9] While the former SEC Chairman, Christopher Cox, supported adoption of IFRS (SEC 2008), his successor, Mary Schapiro, preferred not to make such a decision, and instead supported the continuation of the convergence projects.

[10] https://www.ifac.org/global-knowledge-gateway/business-reporting/discussion/does-ifrs-have-future-us. Published in IFAC 2015.

preferable to adoption of IFRS by U.S. firms in the near future. In contrast, Jamal et al. (2010) argue that it is unlikely to achieve comparability and consistency of financial reporting on a global basis through convergence and instead propose that U.S. firms be allowed to choose between U.S. GAAP and IFRS.

To the best of our knowledge, no study has examined whether adoption or convergence provided different benefits in terms of comparability. This is a timely and important question given the importance of comparability to global capital markets, dichotomous approaches used by countries to align their domestic accounting standards with IFRS, and the ongoing policy deliberation in the U.S. Germany provides an ideal setting to investigate this issue. We discuss the main characteristics of the German markets in the following section.

2.2 The German Market, Adoption of IFRS, and Enforcement Implementation

In March 1997, the German government opened the New Market (Neue Markt) in an effort to attract international investors to small- and medium-sized, high-growth corporations. Firms that opted to list securities in this market were required to follow either U.S. GAAP or IFRS.[11] The government later permitted all publicly-listed companies to choose among German GAAP, U.S. GAAP, or IFRS beginning April 1998 (German Parliament, "*Law to Facilitate the Raising of Capital*"). Although originally successful, the economic downturn in the early part of the last decade led to the closure of the New Market in 2002. Many German firms, however, chose to continue reporting under U.S. GAAP until they were mandated to switch to IFRS in 2005. Similarly, there are also many German

[11] IASs are the standards that were developed by the International Accounting Standards Committee (IASC), the predecessor of the International Accounting Standards Board (IASB). Some of IASs are still effective. Hence, this study uses IFRS to include both IAS and IFRS.

firms that continued to apply IFRS before the mandatory adoption of IFRS on January 1, 2005.

In addition to the mandatory adoption of IFRS effective on January 1, 2005, there were concurrent changes in other aspects of the reporting environment of German firms, particularly with respect to enforcement. Effective from the fourth quarter of 2005, the Financial Reporting Enforcement Panel ("FREP") was created to oversee publicly-listed firms' compliance with reporting standards. The FREP can recommend that the financial regulatory authority in Germany, the Bundesanstalt für Finanzdienstleistungsaufsicht ("BaFin"), take action in cases of noncompliance. Prior studies find that enforcement is an important institutional factor that renders the adoption of IFRS effective rather than firms merely adopting these standards as a label (Daske et al. 2013). Thus, while it is difficult to disentangle the effects of adoption and enforcement, without these enforcement changes the effect of adoption would be potentially undermined. Consistent with this notion, Christensen et al. (2013) find that improvements in market liquidity around mandatory IFRS adoption are limited to firms in E.U. countries that also enacted concurrent changes in enforcement.[12] More importantly, Cascino and Gassen (2015) find that compliance with IFRS is an important factor to warrant increased comparability after IFRS adoption, even in a country with strong enforcement like Germany.

The unique setting in Germany allows us to form samples of adoption firms and convergence firms and employ the difference-in-differences method to examine the respective and relative effect of adoption of IFRS and convergence between IFRS and U.S. GAAP on comparability.

[12] Finland, the Netherlands, Norway, and the United Kingdom are among other European countries to impose new enforcement regulations alongside IFRS adoption in 2005.

3. Prior Research and Hypothesis Development

Previous studies find that a switch from local accounting standards to IFRS increases comparability among non-U.S. firms and between U.S. firms and non-U.S. firms. For instance, Yip and Young (2012) find that the mandatory adoption of IFRS in the E.U. increases cross-country comparability, measured by the similarity of accounting functions, the degree of information transfer, and the similarity of the information content of accounting numbers. Barth et al. (2012) find that the comparability between foreign and U.S. firms increased after foreign firms adopted IFRS. In the setting of Germany, German U.S. GAAP and German GAAP firms were required to switch to IFRS in 2005 while German IFRS firms continued to use IFRS after 2005. Following the extant literature, we predict that comparability in Germany should increase after all German firms report in accordance with IFRS after 2005. We state our first hypothesis in the null form:

H1: A switch to IFRS from U.S. GAAP does not increase the comparability between German U.S. GAAP and IFRS firms after IFRS adoption in 2005.

Continued convergence can also achieve increased comparability between firms reporting under U.S. GAAP and IFRS in Germany since the convergence projects between the Boards strive to not only reduce the major accounting differences between the two sets of standards but also jointly issue accounting standards in the future. Consistent with this notion, using the IFRS-to-U.S. GAAP reconciliation disclosure in cross-listed firms' Form 20-F, Henry et al. (2009) find that the accounting differences between IFRS and U.S. GAAP during 2004-2006 significantly decreased after the launch of the convergence projects between the Boards although significant accounting differences remain. In addition, using the model of mapping earnings to return, Barth et al. (2012) find that

comparability between non-U.S. firms that apply IFRS and U.S. firms is strongest in more recent years, which is at least partially due to the ongoing convergence between U.S. GAAP and IFRS. In the setting of Germany, convergence projects between the Boards should have increased the comparability between German IFRS and matched U.S. firms when all else being equal. We state our second hypothesis in the null form:

H2: Convergence does not increase the comparability between German U.S. GAAP and matched U.S. firms.

Following the prior research, the above two hypotheses predict that both adoption and convergence could increase comparability, but it is unclear whether a mandatory adoption would lead to a significant, incremental increase in comparability beyond what is achieved through convergence. On one hand, adoption should immediately eliminate any accounting differences between German U.S. GAAP and IFRS firms if both groups of firms fully comply with IFRS. On the other hand, comparability may be compromised by the nature of principles-based IFRS that are normally more flexible and offer more discretionary choices than U.S. GAAP. Thus, there is a possibility that comparability may not significantly increase after IFRS adoption. Consistent with this notion, Cascino and Gassen (2015) find that comparability only marginally increases after 29 countries switched to IFRS. Using sample firms from both Germany and Italy, they also find that only high level of compliance warrants increased comparability.

Convergence may have the same effect on comparability as adoption if the "major" accounting differences are significantly reduced or eliminated by converged accounting standards. For example, SFAS 123 was modified to be consistent with IFRS 2 that the

value of employee share options be expensed as of the grant date. Similarly, SFAS 141 and IFRS 3 were revised word for word, which resulted in a high degree of convergence when dealing with business combinations. However, unlike adoption, which could immediately eliminate any accounting differences, convergence could only reduce the major accounting differences for the following two reasons. First, convergence projects only cover certain short-term and the major accounting differences between IFRS and U.S. GAAP (the Norwalk Agreement 2002) and do not attempt to eliminate all their differences. Second, convergence is a continuous process, which will take a relatively long time to converge U.S. GAAP and IFRS. Hence, the accounting differences between the two sets of standards may exist for a long time. Consistent with this notion, Henry et al. (2009) find that significant accounting differences remain after convergence.

Prior research has not provided clear evidence on the relative effect of adoption and convergence on comparability, we therefore state our final hypothesis in the null form.

H3: Adoption does not provide an incremental increase in comparability beyond what is achieved by convergence.

4. RESEARCH DESIGN

4.1 Measuring the Adoption and Convergence Effects on Comparability

Following previous studies, we use a matched sample research design in assessing changes in financial statement comparability. We first identify German firms that reported under U.S. GAAP in 2002, 2003, and 2004 and adopted IFRS by mandate in 2005 (German U.S. GAAP firms). We then match these firms with German firms that applied IFRS throughout the entire sample period (German IFRS firms). Specifically, each German U.S.

GAAP firm is matched with a German IFRS firm that is in the same industry (based on 2-digit SIC codes) at the end of 2004. We classify the sample period into the pre- (2002-2004) and post-adoption (2006-2010) periods,[13] and assess the change in comparability between these paired firms from the pre- to post-adoption period and attribute this change in comparability to adoption.

We follow the same procedure described above and create a second matched sample that consists of the same German IFRS firms included in the first matched sample and U.S. domestic firms that consistently applied U.S. GAAP during the entire sample period.[14] We then assess the change in comparability between these paired firms in the second matched sample from the pre- to post-adoption period. Since these firms were both affected by the convergence projects between the FASB and IASB, we attribute this change in comparability to convergence.

To examine whether IFRS adoption provides an incremental increase in comparability beyond convergence, we pool these two matched samples and employ the following difference-in-differences regression model to separate the change in comparability driven by convergence and adoption, respectively from other potential economic factors.[15]

$$\begin{aligned} COMP^{n}_{ij,t} = \quad & \alpha_0 + \alpha_1 POST_{ij,t} + \alpha_2 ADOPT_{ij,t} + \alpha_3 POST*ADOPT_{ij,t} + \\ & \alpha_4 MV\_Ratio_{ij,t} + \alpha_5 SALESGROW\_Ratio_{ij,t} + \alpha_6 MB\_Ratio_{ij,t} + \\ & \alpha_7 LEVERAGE\_Ratio_{ij,t} + INDUSTRY + \varepsilon_{i,t} \end{aligned} \qquad (1)$$

[13] We do not include 2005 (the adoption year) in our analyses to mitigate concerns that detected changes are confounded by some temporary effect during the transition to IFRS.

[14] In supplemental tests, we also consider all the German IFRS firms and match them with U.S firms to offer a broader representation of the convergence effect.

[15] As a robustness test, we also include the interaction terms between control variables and *POST*. Our results are qualitatively similar.

In Equation (1), $COMP^{n}_{ij,t}$ represents a comparability metric (n = 1, 2, or 3) for the matched pair of firms *i* and *j* in period *t*. We measure the comparability metrics in such a way that a larger (or less negative) value indicates a greater comparability. *POST* is an indicator variable equal to 1 if *t* is after 2005. *ADOPT* is an indicator variable equal to 1 if the matched pair of firms *i* and *j* consists of a German U.S. GAAP and a German IFRS firm and 0 if the matched pair of firms consists of a German IFRS firm and a U.S. firm. The coefficient on *POST* captures the effect of convergence on comparability as it reflects changes in comparability for the matched German IFRS firms and U.S. firms. Our variable of interest is the interaction term of *POST*ADOPT*. A positive and significant coefficient on this term (α_3) suggests that adoption provides an incremental increase in comparability beyond convergence.

We also follow Yip and Young (2012) to include *MV_Ratio,* measured as the ratio of the relative market values of the firms included in each matched pair, to control for the possibility that changes in firm size over time among the matched firms impacts comparability. In addition, only a small proportion of German firms chose to voluntarily adopt U.S. GAAP before 2005, which raises the concern about a potential self-section bias. Leuz (2003) finds that New Market firms reporting under different sets of accounting standards generally produce financial information of similar quality based on a variety of liquidity measures. To further address this concern, we follow prior studies (Leuz 2003; Christensen et al. 2008) and include the ratio of the matched firms' sales growth (*SALESGROW_Ratio*), market-to-book (*MB_Ratio*), and leverage (*LEVERAGE_Ratio*), as these factors have been shown to be associated with accounting standard choice. We also control for industry fixed effects.

4.2 Comparability Metrics

We follow the literature to use three different comparability measures. De Franco, Kothari, and Verdi (2011) posit that accounting comparability can be described as the degree to which accounting functions similarly translate economic events (proxied by stock return) into financial statement information (proxied by reported earnings). We estimate the following regression to model each firm's accounting function:

$$NI/P_{i,t} = \alpha^i + \beta^i RET_{i,t} + \varepsilon_{i,t} \quad (2)$$

where $NI/P_{i,t}$ is calculated as net income before extraordinary items per share divided by stock price at the beginning of the year for firm i in period t. $RET_{i,t}$ is the stock return of firm i in period t, adjusted for dividends and stock splits. The coefficients (α^i and β^i) represent the estimated accounting function of firm i. Following Yip and Young (2012), we estimate Equation (2) at the firm level using semi-annual data separately in the pre- and post-adoption periods.

We construct the first comparability metric as follows. First, for each matched pair of German U.S. GAAP firm (firm i) and German IFRS firm (firm j), we estimate Equation (2) separately at the firm-level to obtain the coefficients representing firm i's accounting function (α^i and β^i) and the coefficients representing firm j's accounting function (α^j and β^j). Second, for firm i in each semi-annual period t, we calculate the expected value of *NI/P* using its own accounting function (α^i and β^i) and the corresponding matched firm j's accounting function (α^j and β^j), yielding two expected *NI/P* ($E NI/P^i_{i,t}$ and $E NI/P^j_{i,t}$). The absolute value of the difference between the two expected *NI/P*s, computed as $|E NI/P^i_{i,t} - E NI/P^j_{i,t}|$, is defined as $COMP^1\_USGAAP$. Third, we repeat this process for firm j in each semi-annual period and obtain two expected *NI/P* ($E NI/P^j_{j,t}$ and $E NI/P^i_{j,t}$). Again, the

absolute value of the difference in the two expected *NI/P*s, computed as $|E NI/P^{j}_{j,t} - E NI/P^{i}_{j,t}|$, is defined as $COMP^{1}\_IFRS$. Fourth, we calculate the mean of $COMP^{1}\_USGAAP$ and $COMP^{1}\_IFRS$ to obtain the first comparability metric ($COMP^{1}$). We multiply $COMP^{1}\_IFRS$, $COMP^{1}\_USGAAP$, and $COMP^{1}$ by (-1) so that a larger (or less negative) value indicates greater comparability. We repeat these steps to obtain $COMP^{1}\_IFRS$, $COMP^{1}\_US$, and $COMP^{1}$ for the matched German IFRS firms and U.S. firms.

We next consider the comparability measure employed by Barth et al. (2012) based on the mapping of earnings levels and changes into stock returns.

$$RET_{i,t} = \delta^{i}_{0} + \delta^{i}_{1} NI/P_{i,t} + \delta^{i}_{2} \Delta NI/P_{i,t} + \delta^{i}_{3} LOSS_{i,t} + \delta^{i}_{4}(LOSS_{i,t} * NI/P_{i,t}) + \delta^{i}_{5}(LOSS_{i,t} * \Delta NI/P_{i,t}) + \varepsilon_{i,t} \quad (3)$$

In Equation (3), $RET_{i,t}$ is the stock return of firm *i* in period *t*, measured from nine months before until three months after fiscal year end and adjusted for dividends and stock splits, *NI/P* is net income per share scaled by stock price at the beginning of the fiscal year, and *ΔNI/P* is the annual change in net income per share scaled by stock price at the beginning of the fiscal year. We also include an indicator variable equal to one for firms with negative net income in year *t* (*LOSS*) and allow the coefficients on *NI/P* and *ΔNI/P* to differ for loss firms (Hayn 1995).

The procedure to obtain our second comparability metric ($COMP^{2}$) from Equation (3) is identical to the procedure described above for $COMP^{1}$ with the following exception. Data limitations make the estimation of firm-level regressions impractical due to the small number of observations for each firm in the pre- and post-adoption periods. We therefore follow prior studies (Lang, Maffet, and Owens 2010; Barth et al. 2012) and estimate

Equation (3) at the industry level (based on 2-digit SIC codes) and separately for the pre- and post- periods for each group of firms.

The above two comparability measures rely on the fundamental association between earnings and stock returns that might have changed following IFRS adoption. We therefore follow the approach used in Cascino and Gassen (2015) and construct a third comparability measure based on the mapping of operating cash flows into accruals. This measure does not only capture a central aspect of the accounting recognition process (Dechow 1994; Ball and Shivakumar 2005) but also has the advantage of capturing fundamental economic events via cash flows.

$$ACC_{i,t} = \delta^{i}_{0} + \delta^{i}_{1} CFO_{i,t} + \varepsilon_{i,t} \quad (4)$$

In Equation (4), *ACC* is total accruals, deflated by lagged total assets. *CFO* is cash flow from operations, deflated by lagged total assets. The procedures to obtain our third comparability metric ($COMP^3$) from Equation (4) are identical to the procedures to obtain $COMP^2$.

4.3 Information Transfer

Information transfer occurs when new information about one firm is released and market participants use this information to adjust the stock prices of the non-announcing firms accordingly. To the extent that comparability between firms improves due to adoption or convergence, market participants should be able to increase the use of the information released from one firm to re-evaluate the equity value of other similar firms. Following Yip and Young (2012), we employ the following regression model to test whether adoption and convergence separately improves information transfer:

$$|CAR\_NA_{i,t}| = \gamma_0 + \gamma_1 INFORMATION_{j,t} + \gamma_2 POST_t + \gamma_3 POST_t * INFORMATION_{j,t} + \gamma_4 NUMEST_{j,t} + \gamma_5 SIZE_{j,t} + \gamma_6 LOSS_{j,t} + INDUSTRY + \varepsilon_{i,t} \quad (5)$$

$|CAR\_NA_{i,t}|$ is the absolute value of cumulative abnormal return of a non-announcing firm i, which captures the market reaction of the non-announcing firm surrounding the corresponding announcing firm's earnings announcement. *POST* is an indicator variable equal to one if year t is after 2005. *NUMEST* is equal to the number of analysts providing forecast information for firm j in year t and controls for varying levels of analyst following that may influence the market's use of new information. *LOSS* is an indicator variable equal to one if firm j reports negative earnings in year t, and *INDUSTRY* represents dummy variables to control for industry fixed-effects. Following prior studies (Byard, Mashruwala, and Suh 2011; Yip and Young 2012; Wang 2014), we employ two measures to proxy for *INFORMATION*: the absolute value of abnormal stock returns of the announcing firm surrounding its earnings announcement and the announcing firm's analyst forecast error, measured by the absolute value of the difference between actual earnings and the most recent median earnings forecast, scaled by stock price at the beginning of the year.

We use the following equation to examine if adoption provides an incremental increase in information transfer beyond convergence.

$$|CAR\_NA_{i,t}| = \gamma_0 + \gamma_1 INFORMATION_{j,t} + \gamma_2 POST_t + \gamma_3 POST_t * INFORMATION_{j,t} + \gamma_4 NUMEST_{j,t} + \gamma_5 SIZE_{j,t} + \gamma_6 LOSS_{j,t} + \gamma_7 ADOPT + \gamma_8 POST * ADOPT + \quad (6)$$

$$\gamma_9 ADOPT*INFORMATION_{j,t} +$$

$$\gamma_{10} POST*ADOPT*INFORMATION_{j,t} + INDUSTRY + \varepsilon_{i,t}$$

We estimate the above equation for all three categories of firms. *ADOPT* is equal to 1 if the matched firms *i* and *j* are the German U.S. GAAP and German IFRS firm pairs, 0 if the matched firms *i* and *j* are the U.S. and German IFRS firm pairs. Our variable of interest is *POST*ADOPT*INFORMATION*. A significant and positive coefficient on this interaction term (γ_{10}) would suggest that adoption provides an incremental information transfer beyond convergence.

To calculate *CAR_NA* and *CAR_A* we estimate the following market model:[16]

$$RET_{i,t} = \alpha^i + \beta^i RET_{m,t} + \varepsilon_{i,t} \quad (7)$$

$RET_{i,t}$ is the stock return of firm *i* on day *t*, and $RET_{m,t}$ is the stock return of the firm's domestic market on day *t*.[17] The coefficients of α^i and β^i are estimated using data from 185 to 6 days before the earnings announcement date of the announcing firm. The abnormal stock return of firm *i* on day *t* is calculated as $U_{i,t} = RET_{i,t} - (\alpha^i + \beta^i RET_{m,t})$; *CAR_NA* (*CAR_NA*), the cumulative abnormal return of a non-announcing firm (announcing firm), is therefore the sum of its abnormal returns in the three days surrounding the earnings announcement of the announcing firm.

[16] We also measure abnormal return as the market adjusted stock return. The results are qualitatively similar.

[17] For German firms, the market return index is DAX. For U.S. firms, the market return index is the weighted average market return.

5. SAMPLE AND DATA

We obtain accounting standards data for German firms from Worldscope. We classify German U.S. GAAP firms (German IFRS firms) as firms that reported under U.S. GAAP (IFRS) in the pre-adoption period (2002-2004) and reported under IFRS in the post-adoption period (2006-2010).[18] We identify 74 (206) German U.S. GAAP (German IFRS firms). From the 74 German U.S. GAAP firms, we eliminate 8 firms with insufficient data requirements and 3 firms that cannot be matched based on industry. We then match the remaining 63 firms to German IFRS firms based on industry, fiscal year, and size. We then eliminate 16 firm-pairs whose closest match based on the firms' market value of equity is inadequate.[19] Thus, the final sample consists of 47 pairs of German U.S. GAAP and German IFRS firms. We form our second matched sample using the same criteria, but match the German IFRS firms with U.S. firms. Appendix B lists all the company names, firm identification number (DSCD) in Datastream, and two-digit SIC codes. We obtained all accounting data from Worldscope and stock return and market index data from Datastream.

We are aware of the relative small sample size in this study and therefore interpret our results with caution. However, prior studies (e.g., Leuz 2003; Bartov, Goldberg, and Kim 2005) also use a small sample of German firms to investigate the effect of adoption of U.S. GAAP and IFRS on accounting quality. For instance, the final sample size of German U.S. GAAP firms used in Leuz (2003) is 29 (93) firms for 1999 (2000). Limiting

[18] We follow the Appendix A of Daske et al. (2013) in coding accounting standards based on Worldscope (WS), "Accounting Standards Followed" (Field 07536).
[19] Specifically, we calculate a ratio of the matched pair firms' market values and exclude those matched pairs where this ratio is less than 0.50 or greater than 2 (Barth et al. 2012).

our setting to a single country could mitigate potentially confounding issues such as differing levels of economic development, institutional factors, etc. (Francis et al. 2014).[20]

Panel A of Table 1 summarizes our sample selection process. Panels B and C of Table 1 present the industry distribution of sample firms for the semi-annual and annual analyses, respectively. A majority of the sample firms are in business services, industrial equipment, electronic equipment, medical instruments and supplies, and management services industries.

[Table 1]

Table 2 presents descriptive statistics for the input variables used to compute comparability metrics and for the subsequent analyses. To mitigate the effects of outliers on our inferences, we winsorize all continuous variables used in our analyses at the top and bottom 1% for the primary tests.[21] Panel A presents the descriptive statistics for the variables that are used to construct $COMP^1$. Both net income (*NI/P*) and stock return (*RET*) are measured for each semi-annual period. In contrast, Panel B shows the descriptive statistics for the variables that are used to construct $COMP^2$ and $COMP^3$. *RET* is computed from nine months before until three months after fiscal year end while *NI/P* is the annual net income per share scaled by the stock price at the beginning of the fiscal period. The

[20] We have also investigated non-German E.U. firms and non-E.U. firms that switched to IFRS from U.S. GAAP. We find that only 22 non-German E.U. firms switched to IFRS from U.S. GAAP, but only 9 of these firms have sufficient data to construct the comparability measure developed by De Franco et al. (2011). The results using these firms show that IFRS adoption increases comparability for non-German E.U. firms, but the increase is not statistically significant. We do not report the results due to its small sample size. We do not find any non-E.U. firms that switched to IFRS from U.S. GAAP during our test period, although we find that some firms continued to use U.S. GAAP (such as Canadian and Israeli firms that cross list in the US markets) and IFRS (such as non-E.U. and some Asian firms) throughout the test period.

[21] Since our sample is relatively small, we also use the non-parametric bootstrapping method to estimate the variability and bias of our parametric estimate. Specifically, we construct 500 samples and estimate our primary models 500 times. The results are consistent with our main finding that adoption does not consistently provide an incremental increase to comparability beyond convergence based on the comparability measures from De Franco et al. (2011), Barth et al. (2012), and Cascino and Gassen (2015).

size of the firm (*MV*) is measured at the end of each fiscal year. *ΔNI/P* is the annual change in net income per share. *LOSS* is an indicator variable that is equal to 1 if *NI/P* is negative, 0 otherwise. *ACC* is total accruals, calculated as net income less operating cash flows, deflated by lagged total assets. *CFO* is cash flows from continuing operations deflated by lagged total assets. *T*-statistics based on differences in the means (non-directional) show that *RET*, *NI/P*, and *MV* for all three groups of our sample firms are not statistically different, indicating that the matched firms are similar in terms of their stock performance, profitability, and firm size. Univariate tests indicate that German U.S. GAAP firms tend to have lower sales growth and leverage than German IFRS firms while U.S. firms tend to have lower leverage than German IFRS firms.[22]

[Table 2]

The estimated parameters of models (2), (3), and (4) in the pre- and post-adoption periods are important for constructing three comparability measures in this study. Untabulated results show that across three different groups of firms and in both pre- and post-adoption periods, the parameters of estimating $COMP^1$, i.e. the coefficient of regressing earnings on return, are consistent with the prediction that earnings and return are positively associated. The R-squared values are within a reasonable range (between 0.06 and 0.14). Similarly, the parameters of estimating $COMP^2$, i.e. the coefficients of regressing return on earnings, change in earnings, loss, the interaction of loss and earnings and the interaction of loss and change in earnings, are generally consistent with the predictions. We find that return is positively associated with earnings and change in

[22] We also match each German U.S. GAAP firm with U.S. firms that from the same industry sector (based on the two-digit SIC). Untabulated results show that German U.S. GAAP firms are generally smaller, rely more on debt, and have lower market-to-book ratio and sales growth than average U.S. firms. We have controlled for these factors in our regression analysis.

earnings, and is negatively associated with loss except for German IFRS firms. We also find that return is negatively associated with the interaction of loss and earnings across three groups of firms and is negatively associated with the interaction of loss and change in earnings except for U.S. firms. The R-squared values (between 0.24 and 0.47) of estimating $COMP^2$ appear to be much higher than those of estimating of $COMP^1$. Finally, the parameters of $COMP^3$, i.e. the coefficient of regressing earnings on operating cash flows, are consistent with the prediction that earnings and operating cash flow are negatively associated across three different groups of firms. Their R-squared values are within a wider range (between 0.06 and 0.27). Overall, we find that the estimated parameters for our comparability measures are generally consistent with our prediction.

6. EMPIRICAL RESULTS

6.1 Comparability Metrics and Effects of Adoption and Convergence on Comparability

Table 3 presents a univariate analysis of the comparability metrics and firm characteristic ratios for the German U.S. GAAP and IFRS matched firm pairs. Panel A of Table 3 reports the descriptive statistics for the variables related to the analysis of $COMP^1$. The mean (median) of $COMP^1$ increases from -0.303 (-0.093) in the pre-adoption to -0.077 (-0.047) in the post-adoption period, and the differences are statistically significant at the 1% level. Panel B reports the correlations (Pearson correlations are below while Spearman correlations are above the diagonal) of $COMP^1$ and firm characteristic ratios for the German U.S. GAAP and IFRS firm matched pairs. The Pearson correlation matrix presents that $COMP^1$ is positively correlated with *POST* (0.295) indicating that comparability is higher in the post adoption period. $COMP^1$ is negatively correlated with *MV_Ratio* and *LEVERAGE_Ratio* (-0.326 and -0.190, respectively), indicating that comparability is lower

when German U.S. GAAP and IFRS firms have greater difference in firm size and leverage. The Spearman correlation matrix presents consistent results. Panel C reports the descriptive statistics for the variables related to the analysis of $COMP^2$ and $COMP^3$. The mean (median) of $COMP^2$ increases from -0.528 (-0.300) in the pre-adoption period to -0.205 (-0.100) in the post-adoption period, and the differences are statistically significant at the 1% level. Similarly, the mean (median) of $COMP^3$ increases from -0.052 (-0.035) in the pre-adoption period to -0.024 (-0.017) in the post-adoption period. Again, the differences are statistically significant at the 1% level. The Pearson correlation matrix reported in Panel D shows that both $COMP^2$ and $COMP^3$ increase in the post adoption period (0.325 and 0.346, respectively); $COMP^2$ and $COMP^3$ are also positively corrected (0.332). Results are consistent in the Spearman correlation matrix.

Table 3 also provides descriptive statistics for the relative market value (*MV_Ratio*), sales growth (*SALESGROW_Ratio*), market-to-book (*MB_Ratio*), and leverage (*LEVERAGE_Ratio*) of matched firm pairs. There is consistent evidence in both Panels A and C that German U.S. GAAP firms have higher market capitalization than their matched German IFRS firms but the difference reduces in the post-adoption period. Both the means and medians of *SALESGROW_Ratio*, *MB_Ratio*, and *LEVERAGE_Ratio* in the pre- and post-adoption periods are not statistically different at conventional significance levels.

[Table 3]

We next turn to the comparability between matched German IFRS and U.S. firms. Panel A of Table 4 reports the descriptive statistics for the variables used for the analysis of $COMP^1$. The mean (median) of $COMP^1$ increases from -0.277 (-0.109) in the pre-

adoption period to -0.088 (-0.052) in the post-adoption period, and the differences are statistically significant at the 1% level[23]. Panel B reports the correlations (Pearson correlations are below while Spearman correlations are above the diagonal) of $COMP^1$ and firm characteristic ratios for the German IFRS and U.S. firm matched pairs. The Pearson correlation matrix shows that $COMP^1$ is positively correlated with *POST* (0.296) indicating that comparability increases in the post adoption period. $COMP^1$ is also negatively correlated with *MV_Ratio* and *LEVERAGE_Ratio* (-0.144 and -0.178 respectively), indicating that comparability is lower when German IFRS and U.S. firms have greater difference in firm size and leverage. In Panel C of Table 4, we report the results of $COMP^2$ and $COMP^3$. The mean (median) of $COMP^2$ increases from -0.76 (-0.387) in the pre-adoption period to -0.303 (-0.176) in the post-adoption period, and these changes are also statistically significant at the 1% level. Similarly, the mean (median) of $COMP^3$ increases from -0.67 (-0.047) in the pre-adoption period to -0.053 (-0.046) in the post-adoption period, and the change is statistically significant at the 1% (10%) level.[24] The Pearson correlation matrix reported in Panel D shows that both $COMP^2$ and $COMP^3$ are positively correlated (0.385), and that both $COMP^2$ and $COMP^3$ are positively associated with *POST* (0.310 and 0.169, respectively), indicating that comparability increases in the post adoption period.

[23] We winsorized *COMP* and its two components separately. Therefore, the mean of *COMP* is not exactly equal to the average of its two components' means.

[24] We also examine the parameters of the models that we have used to construct the various comparability measures. Untabulated results show that all the regression parameters are not significantly different between the pre- and post-adoption periods, except that the intercepts for German U.S. GAAP and German IFRS firms when using $COMP^1$. These results suggest that the observed increases in comparability are due to greater predictability between matched firm pairs rather than the changing relationship within firms in the pre- and post-adoption periods.

Descriptive statistics for relative market values (*MV_Ratio*), sales growth (*SALESGROW_Ratio*), market-to-book (*MB_Ratio*), and leverage (*LEVERAGE_Ratio*) of matched pairs show consistent evidence that U.S. firms have higher market-to-book ratios than their matched German IFRS firms, but the difference reduces in the post-adoption period. The means and medians of *SALESGROW_Ratio*, *MV_Ratio*, and *LEVERAGE_Ratio* in the pre- and post-adoption periods are not significantly different at conventional levels.

[Table 4]

To illustrate the changes in comparability over the sample period, we convert the univariate results by year into the graphs presented in Figure 1 and highlight the following trends. First, for $COMP^1$, there is a sharp increase in comparability over the sample period using both the means and medians based on both adoption (*ADOPT_MEAN* and *ADOPT_MED*) and convergence (*CONV_MEAN* and *CONV_MED*). Moreover, it is important to note that the increase in comparability is relatively stable after the cutoff in 2005. Second, although a similar pattern is observed for $COMP^2$, the effect does not appear to be sustained throughout the entire sample period. Finally, for $COMP^3$, there is a jump in comparability based on the effect of adoption, which is sustained throughout the post-adoption period. On the other hand, while there appears to be an increasing trend for convergence based on $COMP^3$, it is a much less drastic effect.

[Figure 1]

In sum, we find that both adoption and convergence increase the comparability between IFRS and U.S. GAAP. We next examine whether there is any incremental effect of adoption of IFRS beyond what is achieved through convergence.

6.2 Regression Results: Incremental Effect of Adoption Relative to Convergence

Table 5 reports the regression results from estimating Equation 1. Reported *p*-values are based on robust standard errors clustered at the firm-pair level. The coefficient on *POST* is positive and statistically significant at the 1% level when comparability is measured as either $COMP^1$ or $COMP^2$ and at the 10% level when comparability is measured as $COMP^3$. These results are consistent with our earlier univariate results that convergence appears to have a significant effect on improving comparability. The coefficients on *POST*ADOPT,* however, are insignificant when comparability is measured as either $COMP^1$ or $COMP^2$, but it is significant at the 5% level when comparability is measured as $COMP^3$. Overall, our results suggest that IFRS adoption does not appear to have consistently provided a significant, incremental increase in comparability beyond what is achieved through convergence.

[Table 5]

6.3 Evidence from Information Transfer

We follow Yip and Young (2010) and Cascino and Gassen (2015) to provide results for information transfer. Table 6 reports that for German U.S. GAAP and IFRS firms, the coefficient on *POST*INFORMATION* is significantly positive at the 10% level when *INFORMATION* is measured using the absolute value of the announcing firm's abnormal returns surrounding its earnings announcement (*ABS_CAR_A*), although it is not significant when *INFORMATION* is measured using the absolute value of the announcing firm's analyst forecast error (*ABS_FE_A*).[25] This suggests that information transfer

[25] Further analysis indicates that consistent with Lin et al. (2012) earnings quality of German U.S. GAAP firms, measured by the earnings response coefficient, reduces after these firms switched to IFRS in 2005. In contrast, earnings quality of German IFRS firms marginally increases after 2005.

marginally improves after German U.S. GAAP firms switched to IFRS. For U.S. and German IFRS firms, however, the coefficient on *POST*INFORMATION* is insignificant when using either measure for *INFORMATION*, suggesting that convergence may not be a significant driver of improvements in information transfer. Wang (2014) finds that information transfer is generally weaker between firms located in different countries, which might explain the lack of a finding with respect to convergence. Finally, we find that the coefficient on the interaction term of *POST*ADOPT*INFORMATION* is insignificant in both model specifications, suggesting that there is no incremental effect of IFRS adoption beyond convergence on information transfer.

[Table 6]

6.4 Robustness Tests

We have performed a variety of additional tests to ensure that our results are robust to alternative research design choices.

Economic change effect due to the recent financial crisis

To further investigate whether our main findings are affected by the recent financial crisis, we compare the results for 2002-2008 and 2002-2010 and find that results using both test periods are qualitatively consistent.

Control for the Impact of Enforcement

Germany passed financial reporting enforcement regulation in 2005 to ensure full compliance with IFRS, which is a potentially confounding event with IFRS adoption. Strong enforcement could significantly limit managerial discretion, which in turn can increase the comparability of financial statements prepared by companies. Christensen et al. (2013) argue that both enforcement and IFRS adoption are bundled and cannot be easily

separated in countries like Germany.

The difference-in-differences method employed in this study should mitigate the above concern because both the adoption and convergence effects are likely to be affected by the enforcement regulation. To further shed light on whether enforcement affects comparability and whether the enforcement effect dominates our finding, we conduct the following additional tests. First, we measure the effect of enforcement by examining the change in comparability of the pair matched German IFRS firms (i.e., one German IFRS firm is matched with another German IFRS firm) in the pre- and post-adoption periods.[26] Conceptually, since all German IFRS firms complied with the same accounting standards, any increased comparability between the pair matched German IFRS firms over the sample period can be attributed to enforcement.

We then compare the previously observed adoption effect with any change in comparability driven by enforcement. The model used to investigate this issue is as follows:

$$\begin{aligned} COMP^{n}_{ij,t} = \quad & \alpha_0 + \alpha_1 POST_t + \alpha_2 ADOPT\_ENF_{ij,t} + \alpha_3 POST_t * ADOPT\_ENF_{ij,t} \\ & + \alpha_4 MV\_Ratio_{ij,t} + \alpha_5 SALESGROW\_Ratio_{ij,t} + \alpha_6 MB\_Ratio_{ij,t} + \\ & \alpha_7 LEVERAGE\_Ratio_{ij,t} + INDUSTRY + \varepsilon_{it} \end{aligned} \quad (8)$$

where $COMP^{n}_{ij,t}$ denotes one of the three comparability metrics ($COMP^{1}_{ij,t}$, $COMP^{2}_{ij,t}$ or $COMP^{3}_{ij,t}$) for the matched pair with firms *i* and *j* in period *t*; *POST* is an indicator variable

[26] We create the matched sample for the same German IFRS firms used in the adoption and convergence samples. We match each of these German IFRS firms with another German IFRS firm in the same industry (based on 2-digit SIC codes) and has the most similar size (measured as market value of equity) at the end of 2004. We exclude those matched pairs where *MV_ratio* is less than 0.50 or greater than 2. We further impose the requirement of not having mutual match. In other words, if one German IFRS firm *i* is matched with one German IFRS firm *j*, we don't allow firm *j* to be matched with firm *i*.

equal to 1 if year *t* is after 2005; *ADOPT_ENF* is an indicator variable equal to 1 for the matched pairs consisting of a German U.S. GAAP firm and a German IFRS firm; 0 for the matched pairs consisting of a German IFRS firm and another German IFRS firm. Other variables are as previously defined.

Table 7 shows that the coefficients on *POST* are positive and significant in 2 out of 3 cases, suggesting that enforcement increases comparability. More importantly, we find that *POST*ADOPT_ENF* is statistically significant at conventional levels when using $COMP^2$ and $COMP^3$. In other words, we find evidence that increased comparability caused by the mandatory adoption of IFRS is greater than the increased comparability that might be attributable to financial reporting enforcement in Germany. This is the first study to document the joint effects of IFRS adoption and concurrent changes in enforcement within a single country setting.

[Table 7]

Comparability between German U.S. GAAP firms and U.S. firms after IFRS adoption

Both German U.S. GAAP and U.S. firms used U.S. GAAP to prepare their financial statements in the pre-adoption period. However, in the post-adoption period, German U.S. GAAP firms prepare their financial statements under the IFRS. To the extent that firms using the same accounting standards are more comparable than firms that use different accounting standards, we expect to observe a decrease in accounting comparability between German U.S. GAAP firms and U.S. firms in the post-adoption period relative to pre-adoption period. We investigate this issue using the following model:

$$COMP^{n}_{ij,t} = \alpha_0 + \alpha_1 POST_t + \alpha_2 REVERSE_{ij,t} + \alpha_3 POST_t * REVERSE_{ij,t} + \alpha_4 MV\_Ratio_{ij,t} + \alpha_5 SALESGROW\_Ratio_{ij,t} + \alpha_6 MB\_Ratio_{ij,t} + \alpha_7 LEVERAGE\_Ratio_{ij,t} + INDUSTRY + \varepsilon_{i,t}, \quad (9)$$

where *REVERSE* is an indicator variable equal to 1 for the matched pairs consisting of a German U.S. GAAP firm and a U.S. firm; 0 for the matched pairs consisting of a U.S. firm and a German IFRS firm. The other variables are as previously defined. The coefficient on *POST* represents the convergence effect on improving comparability. Consistent with this prediction, Table 8 shows that *POST*REVERSE* is negative and significant at conventional levels using the comparability measures of $COMP^2$ and $COMP^3$, indicating that accounting comparability between German U.S. GAAP firms and U.S. firms decreases significantly in the post-adoption period after controlling for the convergence effect.

[Table 8]

Using all German IFRS firms as the Basis to Measure the Convergence Effect

This study uses matched firm pairs of German U.S. GAAP and German IFRS firms to investigate the adoption effect. The same German IFRS firms used for investigating the adoption effect are used to match U.S. firms to investigate the convergence effect. To maximize the sample size and potentially provide a better estimate of the increased comparability driven by convergence, we repeat our analyses using all German IFRS firms and their matched U.S. firms to investigate whether our previous findings continue to hold. We find that convergence led to an improvement in comparability over our sample period for two out of three comparability measures although the magnitude of increased comparability appears to be smaller. Our difference-in-differences tests, however, show that in this specification adoption does provide a significant, incremental increase in comparability beyond what is achieved by convergence for two out of three comparability measures. This finding is consistent with the general belief that full adoption should provide a higher degree of comparability than partial convergence in our setting. However,

because this test uses additional firms that are not matched with our German U.S. GAAP firms, it is likely that the variability of sample firms' reported accounting numbers increases. Thus, this finding should be interpreted with caution.

Trade-off between Treatment Effect and Population Generalization

This study relies on matched firms for our main empirical tests. There are some concerns over the tradeoff between the treatment effect and population generalization. Cram, Karan, and Stuart (2009) argue that the matching approach that is widely used in accounting literature reflects a trade-off between identifying the treatment effects and generalizing the results to the full population. As a result, the matching approach could reduce the power of tests or bias empirical results due to systematic differences in the subsamples from the full population. We address this concern in two ways. First, we include pair fixed-effects as additional control variables. Second, we use the pair-wise difference as the dependent variable and regress it directly on *POST*. Untabulated results are robust to both of these adjustments.

Adoption and Convergence Compliance

Our finding that adoption does not provide incremental benefits in comparability beyond convergence may have several possible confounding explanations. In this section, we investigate these potential explanations.

First, it is possible that companies attempted to align their accounting practices such that the effect of adoption would result in limited accounting standards changes. For example, German U.S. GAAP firms might make accounting choices that are closer to IFRS before 2005 or make accounting choices that are closer to U.S. GAAP after 2005 to minimize accounting standards changes. As one example, German U.S. GAAP firms may switch to FIFO from LIFO (not permitted by IFRS) before 2005 to comply with IFRS

earlier although this switch would cause significant accounting changes before IFRS adoption. To investigate this possibility, we obtained financial statements for a sample of German U.S. GAAP (15) firms that switched to IFRS in 2005 and provided financial statements in English for 2004 and 2006 on their websites. We find that none of our sample firms had switched to FIFO from LIFO in 2004. We believe that the first scenario is rare because U.S. GAAP generally have less accounting choices than IFRS with inventory methods being one of the very few exceptions.[27] The second scenario could happen if the accounting choices under IFRS and U.S. GAAP are the same or if IFRS have more accounting choices than U.S. GAAP. For example, German U.S. GAAP firms may continue to use FIFO for inventory valuation after 2005 and continue to value investment properties at cost after 2005 in order to minimize accounting changes. This is possible since both U.S. GAAP and IFRS allow the FIFO method (the cost method) for inventory (investment properties). We find that it is a common practice that firms continue to follow the same reporting practices under U.S.GAAP if they are also permitted by IFRS. While it is possible that these and other accounting issues may have resulted in a somewhat more limited effect of adoption, it is difficult to attribute such choices to discretionary choices intended to minimize the effect of adoption of IFRS.

Second, adoption may not provide incremental increase in comparability beyond convergence if the major accounting differences are small. To investigate these possibilities, we perform two additional tests using the same sample of German U.S. GAAP firms. First, we investigate the magnitude of accounting differences and the key items

[27] We also investigate whether the first scenario could apply to any accounting items causing major accounting differences, including share-based payment, pension and post employee benefits, intangible assets, impairment, and business combinations. We find that in all cases, IFRS have more accounting choices than U.S. GAAP, which exclude the possibility of the first scenario.

causing the differences. Panel A of Table 9 shows that adoption would reduce accounting difference in net income and shareholders' equity by 5% and 3%, respectively, which is economically material. We also find that the major accounting differences are related to share-based payment, pension and post-employee benefits, intangible assets, impairment, and business combinations. Third, German U.S. GAAP firms may not have been in full compliance with IFRS after adoption., To address this concern, we investigate whether German U.S. GAAP firms followed the measurement and disclosure compliance requirements following IFRS adoption for the above key items that cause major accounting differences. Panel B of Table 9 shows that the average measurement and disclosure compliance rates are high for those major differences except for two specific items related to the pensions and post-employment benefits disclosure. This evidence is generally consistent with the fact that Germany is one of the very few countries with new enforcement regulation to ensure firms to fully comply with IFRS. Thus, we can reasonably conclude that for our sample of firms, lack of compliance is unlikely to be an explanation for a muted adoption effect.

We also validate the results for the convergence effect by comparing the average measurement and disclosure compliance rates for both German IFRS firms and matched U.S. firms. We only include those standards related to the "completed" convergence projects up to 2010, such as share-based payment, discontinued operations, borrowing costs, segment reporting, and business combinations. Our sample firms include 15 German IFRS firms with financial statements in English on their websites for the period 2005-2010 and a sample of matched U.S. firms. Panel C of Table 9 shows that in general the average measurement and disclosure compliance rates are high and comparable for both groups of

firms, except for a few specific items related to segment reporting. In summary, we find evidence that compliance is high after accounting standards changes due to convergence.

[Table 9]

7. CONCLUSION

This study is motivated by the fact that many countries used either the adoption or convergence approach when they aligned their domestic accounting standards with IFRS over the last decade. IFRS adoption could eliminate any accounting differences between IFRS and domestic accounting standards in a short period of time, but the principles-based nature of IFRS and the use of different versions of IFRS across different countries could significantly reduce comparability after IFRS adoption. On the other hand, IFRS convergence aims to reduce the major accounting differences between IFRS and domestic accounting standards, but it does not attempt to eliminate all the accounting differences. With respect to U.S. GAAP, prior research finds that significant differences between IFRS and U.S. GAAP remain after the continued convergence between the two sets of standards over the last decade. Hence, it is unclear ex ante whether adoption provides a greater increase in comparability than convergence. Using a setting unique to Germany, this study investigates whether the adoption of IFRS and convergence between IFRS and U.S. GAAP provide a significant increase in comparability, respectively and whether adoption or convergence provides a greater increase in comparability.

Using various comparability and information transfer metrics, this study finds that both adoption and convergence increase comparability. Results using the difference-in-differences method, however, show that IFRS adoption does not consistently provide a significant, incremental increase in comparability beyond what is achieved by convergence

between IFRS and U.S. GAAP. Results for change in information transfer yield similar inferences. Our findings are robust to a number of alternative empirical specifications and persist after controlling for the impact of the enforcement regulation in Germany that coincided with IFRS adoption in 2005. The findings of this study should be of interest to regulators and standard-setters as they continue to debate alternative methods of achieve accounting standard globalization.

As a caveat, our results should be interpreted with caution in the context of the U.S. because they are primarily based on the experience of a sample of German firms. It is unclear whether these results would be observed if U.S. firms are allowed to adopt IFRS or if U.S. GAAP are fully converged to IFRS.

Appendix A. Summary of Revisions to Accounting Standards over Sample Period

Revisions made to IFRS and US GAAP

Short term (S) or Major (M) project	IFRS affected	U.S. GAAP affected	Topic of Standard	Effective Year**	Completed**
S		SFAS 151	Invesntory	2005	2004
S		SFAS 154	Accounting Changes	2005	2004
S		SFAS 153	Non-monetary Assets	2005	2004
S	IFRS 2	SFAS 123	Share-based payment	2005	2004
S	IAS 36*		Asset Impairments	2004 2009 2010 2014	Discontinued
S	IAS 40*		Investment property	2005 2009 2014	FASB only project
S	IFRS 5*		Noncurrent assets held for sale and discontinued operations	2005 2009 2010 2016	2004
S	IAS 10*		Events after reporting period	2005 2007	FASB only
S	IAS 23*		Borrowing costs	2009	2008
S	IAS20		Government grant	2009	Discontinued
S	IFRS 8*		Operating segments	2009 2010 2014	2006
S	IAS 12*		Income Tax	2012 2016	Discontinued
S	IFRS 11*		Joint arrangement	2013 2016	2011
M	IAS 38*		Intangible Assets	2004 2009 2014 2016	Discontinued
M	IAS 17*		Lease Accounting	2005 2010 2019	Active
M	IAS 39 and IFRS 9*		Financial instruments	2005 2006 2008 2009 2010 2014 2018	Active
M	IAS 28 and IFRS 12*		Investments in associates	2005, 2009, 2013	Active
M	IFRS 7*		Financial instruments	2007 2008 2009 2010 2011 2013 2015 2016	Active
M	IAS 32*		Presentation of Financial Instruments	2005 2007 2009 2010 2013 2014	Active
M	IFRS 12*		Interests in Joint Ventures	2013 2014 2016	Active
M	IFRS 4*		Insurance contracts	2005 2006	Active
M	IFRS 3*	SFAS 141R	Business Combinations	2009 2010 2014	2008
M	IAS 19*		Employee Benefits	2005 2006 2009 2013 2014 2016	Active
M	IFRS 10 *		Consolidated financial statements	2013 2014 2016	2011
M	IFRS 13*		Fair value measurement	2013 2014	2011
M	IFRS 15*		Revenue Recognition	2017	Active
M			Conceptual framework	2012	IASB only

* indicates that these topics have been addressed by both the FASB and IASB

** multiple effective dates are due to subsequent revisions

Note:

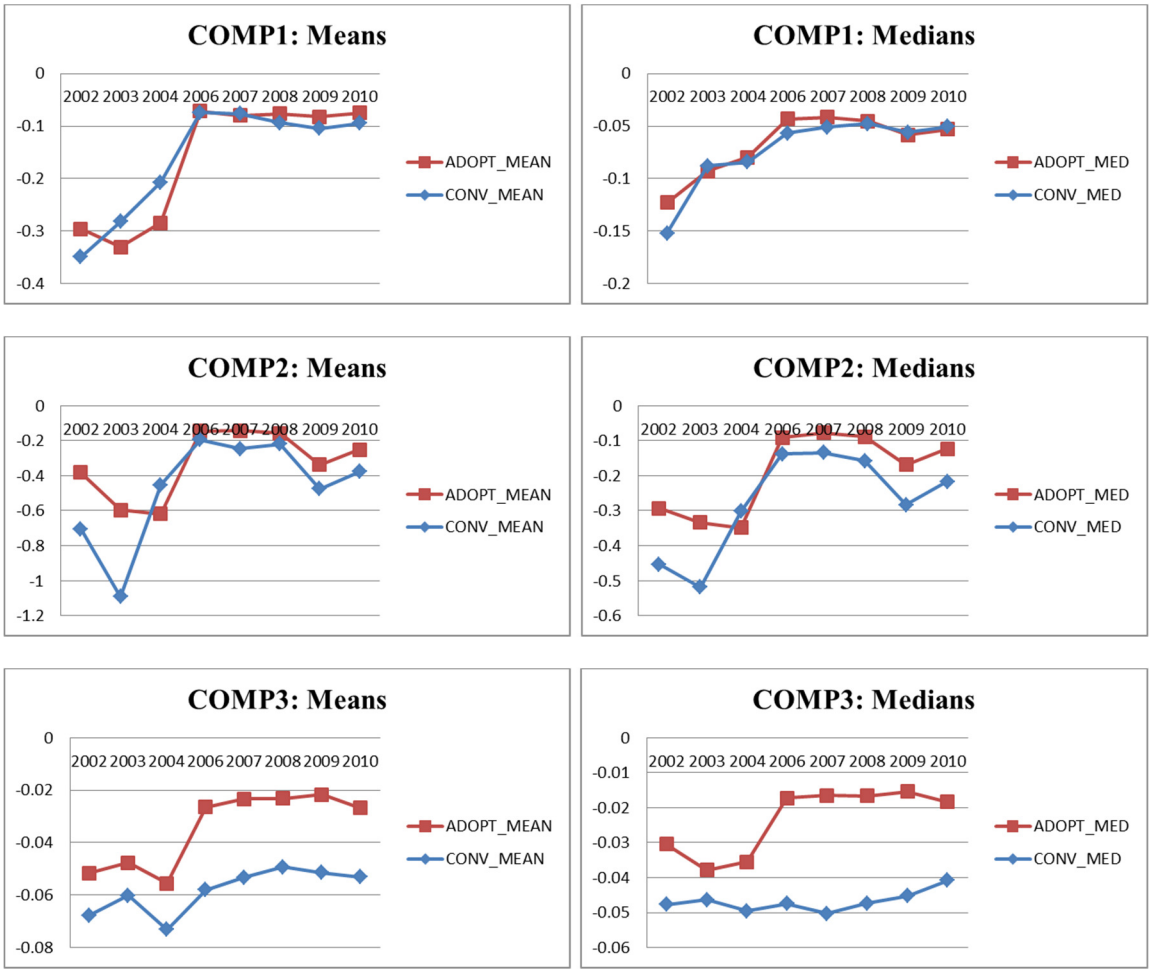
(1) The above summary is based on the information provided by Deloitte's www.IASPLUS.com website and the FASB's progress report of convergence projects;

(2) The scope of the convergence projects between IASB and FASB has changed over time. Some of the joint projects eventually became IASB- or FASB-only research projects. For example, investment properties became a FASB-only project, and the conceptual framework is now an IASB-only project. Some projects were added to the agenda and became joint projects between the Boards although they are not officially part of the Memorandum of Understanding.

Appendix B: The list of firms used in this study

German US GAAP firms		Matched German IFRS firms		Matched US firms		
DSCD	Name	DSCD	Name	DSCD	Name	Two digit SIC
143787	SCHWARZ PHARMA AG	676138	STADA ARZNEIMITTEL AG	545281	ALKERMES	28
944429	LEONI AG	929099	SALZGITTER AG	544465	MUELLER INDS.	33
896674	AIXTRON SE	929021	GILDEMEISTER AKTIENGESELLSCHAFT	320624	KADANT	35
505049	DATA MODUL AG	13703L	NORDEX SE	944605	ASTRO-MED	35
929057	GEA GROUP AG	671294	HEIDELBERGER DRUCKMASCHINEN AG	152553	CAMERON INTERNATIONAL	35
686002	MUEHLBAUER HOLDING AG & CO. KGAA	929060	KSB AKTIENGESELLSCHAFT	867437	INTEVAC	35
679205	PFEIFFER VACUUM TECHNOLOGY AG	992562	KOENIG & BAUER AG	905640	TENNANT	35
280724	QUANMAX AG	13906U	GCI INDUSTRIE AG	951985	DATARAM	35
698163	SUESS MICROTEC AG	775165	TA TRIUMPH-ADLER AG	997092	MET-PRO	35
697126	ADVA AG OPTICAL NETWORKING	899187	R. STAHL AG	998258	COMMS.SYS.	36
695996	BASLER AG	13489T	SUNWAYS AG	515674	KOSS	36
276355	DIALOG SEMICONDUCTOR PLC	899187	R. STAHL AG	895708	GLOBECOMM SYSTEMS	36
275583	ELMOS SEMICONDUCTOR AG	271001	FUNKWERK AG	923732	DIODES	36
681070	EUROMICRON AG COMMUNICATION & CONTROL	671264	LOEWE AG	921638	SPARTON	36
14360D	INIT AG	687848	FIRST SENSOR AG	680656	AXT	36
929030	CONTINENTAL AG	929560	MAN SE	891180	AUTOLIV	37
270903	BIOLITEC AG	270950	JETTER AG	906473	KEWAUNEE SCIENTIFIC	38
698271	ECKERT & ZIEGLER STRAHLEN- UND MEDIZINTE	296156	GERATHERM MEDICAL AG	322881	AETRIUM	38
13703E	PULSION MEDICAL SYSTEMS AKTIENGESELLSCHAFT	686654	STRATEC BIOMEDICAL AG	889785	MEADE INSTS.	38
13966W	W.O.M. WORLD OF MEDICINE AG	697998	AAP IMPLANTATE AG	674605	ROCKWELL MEDICAL	38
275350	WAVELIGHT AG	263860	LINOS AG	326270	PERCEPTRON	38
143373	HANNOVER RUECKVERSICHERUNGS AG	755575	GENERALI DEUTSCHLAND HOLDING AG	28341F	ASSURANT	63
290206	JUBII EUROPE NV	25700Q	AIG INTERNATIONAL REAL ESTATE AG	988513	MESA RTY.TST.	67
283998	118000 AG	690098	TELEPLAN INTERNATIONAL N.V.	286165	ONVIA	73
290298	BECHTLE AG	290300	GRENKELEASING AG	26477P	PRTF.REC.ASSOCS.	73
264716	CAATOOSEE AG	13643N	LS TELCOM AG	271101	INTERNET PATENTS	73
275367	CANCOM IT SYSTEME AG	688731	INTEGRALIS AG	546951	POWERSECURE INTL.	73
290814	CYCOS AG	275600	FABASOFT AG	13690C	CHINA RECYCLING ENERGY	73
295708	IBS AG	698000	TRIA IT-SOLUTIONS AG	895340	ONSTREAM MEDIA	73
698008	IDS SCHEER AG	290300	GRENKELEASING AG	292904	SOHU.COM	73
681876	INTERSHOP COMMUNICATIONS AG	674733	TTL INFORMATION TECHNOLOGY AG	894171	SIMULATIONS PLUS	73
280754	MOOD AND MOTION AG	296750	ALLGEIER HOLDING AG	274611	EGAIN COMMS.	73
288754	NET AG	698267	SHS VIVEON AG	13487R	KIT DIGITAL	73
285246	PIRONET NDH AG	291264	ISRA VISION AG	292701	CLICKSOFTWARE TECHS.	73
697532	REALTECH AG	690168	ALL FOR ONE STEEB AG	875647	VERSANT	73
291742	RUECKER AG	275579	NORCOM INFORMATION TECHNOLOGY AG	325905	DATAWATCH	73
276452	SINNERSCHRADER AG	296420	IVU TRAFFIC TECHNOLOGIES AG	895699	HELIOS & MTSN.INFO.TECH.	73
285242	SOFTLINE AG	13702V	TRIPLAN AKTIENGESELLSCHAFT	546908	ACORN ENERGY	73
269520	SYSKOPLAN AG	686119	COMARCH SOFTWARE UND BERATUNG AG	687080	DATALINK	73
265624	SYZYGY AG	695251	UTIMACO SAFEWARE AG	883830	WILLIS LSE.FIN.	73
681668	TDS INFORMATIONSTECHNOLOGIE AG	698992	GFT TECHNOLOGIES AG	517924	RCM TECHS.	73
697528	TELEGATE AG	290300	GRENKELEASING AG	26477P	PRTF.REC.ASSOCS.	73
287938	BKN INTERNATIONAL AG	273296	CONSTANTIN FILM AG	518029	RENTRAK	78
697712	DEUFOL AG	295059	D+S EUROPE AG	938166	VSE	87
276459	PLAUT AG	265104	ORBIS AG	867192	INDUSTRIAL SVS.OF AM.	87
686274	PLENUM AG	298717	CATALIS SE	867192	INDUSTRIAL SVS.OF AM.	87
295686	SYGNIS PHARMA AG	298717	CATALIS SE	670150	BIOANALYTICAL SYS.	87

Figure 1: Changes in Comparability Metrics over Sample Period



Note: ADOPT_MEAN and CONV_MEAN indicate the mean increased comparability caused by adoption and convergence, respectively. ADOPT_MED and CONV_MED indicate the median increased comparability caused by adoption and convergence, respectively.

The plotted points on each graph are the corresponding annual predicted values.

REFERENCES

Ball, R., and Shivakumar, L., 2005. Earnings Quality in U.K. Private Firms. *Journal of Accounting and Economics* 39: 83-128.

Ball, R. 2006. International financial reporting standards (IFRS): pros and cons for investors. *Accounting and Business Research*. 36(1): 5-27.

Barth, M. E., W. R. Landsman, M.H. Lang, and C. Williams. 2012. Are IFRS-based and US GAAP-based amounts comparable? *Journal of Accounting and Economics*. 54(1): 68-93.

Bartov, E., S. Goldberg, and M. Kim. 2005. Comparative value relevance among German, US and International Accounting Standards: A German stock market perspective. *Journal of Accounting, Auditing & Finance* 20(2): 95-119.

Bradsaw, M., C. Callahan, J. Ciesielski, E. A. Gordon, L. Hodder, P. E. Hopkins, M. Kohlbeck, R. Laux, S. McVay, T. Stober, P. Stocken, and T. L. Yohn. 2010. Response to the SEC's proposed rule—roadmap for the potential use of financial statements prepared in accordance with International Financial Reporting Standards (IFRS) by U.S. issuers. *Accounting Horizons*: 24(1): 117-128.

Byard, D., S. Mashruwala, and J. Suh. 2011. Does the U.S. GAAP reconciliation enhance comparability? Evidence from the SEC's elimination of the IFRS to U.S. GAAP reconciliation. Working Paper, Baruch College-CUNY.

Cascino, S. and J. Gassen. 2015. What drives the comparability effect of mandatory IFRS adoption? *Review of Accounting Studies*: 1-41.

Christensen, H., E. Lee, and M. Walker. 2008. Incentives or standards: what determines accounting quality changes around IFRS adoption? *Working Paper, University of Manchester*.

Christensen, H., L. Hail, and C. Leuz. 2013. Mandatory IFRS reporting and changes in enforcement. *Journal of Accounting and Economics*. 56(2): 147-177.

Cram, D., V. Karan, and I. Stuart. 2009. Three threats to validity of choice-based and matched sample studies in accounting research. *Contemporary Accounting Research*. 26(2): 477–516.

Daske, H., L. Hail, C. Leuz, and R. Verdi. 2013. Adopting a label: heterogeneity in the economic consequences around IAS/IFRS adoption. *Journal of Accounting Research*. 51(3): 495-547.

Dechow, P. M. 1994. Accounting earnings and cash flows as measures of firm performance: The role of accounting accruals. *Journal of accounting and economics.* 18(1): 3-42.

De Franco, G., S.P. Kothari, and R.S. Verdi. 2011. The benefits of financial statement comparability. *Journal of Accounting Research*: 49: 895-931.

Financial Accounting Standards Board (FASB). 2014. Comparability in international accounting standards—an overview. Retrieved from http://www.fasb.org/jsp/FASB/Page/SectionPage&cid=1176156245663.

Francis, J., M. Pinnuck, and O. Watanabe. 2014. Auditor style and financial statement comparability. *The Accounting Review.* 89(2): 605-633.

Haverty, J. 2006. Are IFRS and U.S. GAAP converging? Some evidence from People's Republic of China companies listed on the New York Stock Exchange. *Journal of International Accounting, Auditing & Taxation* 15: 48–71.

Hayn, C. 1995. The information content of losses. *Journal of Accounting and Economics*. 20(2): 125-153.

Henry, E., S. Lin, and Y.W. Yang. 2009. The European-US GAAP gap: IFRS to US GAAP Form 20-F reconciliations. *Accounting Horizons*. 23(2): 121-150.

Holthausen, R. W. 2009. Accounting standards, financial reporting outcomes, and enforcement. *Journal of Accounting Research.* 47(2): 447-458.

Jamal, K., S. Penman, R. Bloomfield, T. E. Christensen, R. Colson, Moehrle, J.A. Ohlson, G. Previts, T. Stober, S. Sunder, R. L. Watts. 2010. A framework for financial reporting standards: issues and a suggested model. *Accounting Horizons.* 24(3): 471-485.

Lang, M.H., M.G. Maffett, and E.L. Owens. 2010. Earnings comovement and accounting comparability: the effects of mandatory IFRS adoption. *Working Paper, University of Rochester.*

Leuz, C. 2003. IAS versus U.S. GAAP: information asymmetry-based evidence from Germany's New Market. *Journal of Accounting Research*. 41(3): 445-472.

Lin, S., W. Riccardi, and C. Wang. 2012. Does accounting quality change following a switch from U.S. GAAP to IFRS? Evidence from Germany. *Journal of Accounting and Public Policy.* 31(6): 641-657.

Nobes, C. 2006. Survival of International Accounting Differences under IFRS: Towards a New Research Agenda, *Accounting and Business Research*. 36(3): 233-245.

Nobes, C., 2011, International Variations of IFRS Adoption and Practice, Certified Accountants Educational Trust.

Memorandum of Understanding, The Norwalk Agreement, 2002, *Financial Accounting Standards Board*, Connecticut, U.S.A.

U.S. Securities & Exchange Commission (SEC). 2008. Roadmap for the potential use of financial statements prepared in accordance with International Financial Reporting Standards by U.S. issuers. *Release No. 33-8982; 34-58960*.

U.S. Securities and Exchange Commission (SEC). 2012. Work plan for the consideration of incorporating International Financial Reporting Standards into the financial reporting system for U.S. issuers. *Final Staff Report* (July 13). Washington, DC: Government Printing Office.

Schipper, K. 2003. The introduction of international accounting standards in Europe: implications for international convergence. *European Accounting Review*. 14(1): 101-126.

Street, D., and S. Gray. 1999. How wide is the gap between IASC and U.S. GAAP? Impact of the IASC comparability project and recent international developments. *Journal of International Accounting, Auditing & Taxation* 8 (1): 133–164.

Yip, R. and R. Young. 2012. Does mandatory IFRS adoption improve information comparability? *The Accounting Review*. 87(5): 1767-1789.

Wang, C. 2014. Accounting standards harmonization and financial statement comparability: evidence from transnational information transfer. *Journal of Accounting Research*. 52(4): 955-992.

White, H. 1980. A heteroskedasticity-consistent covariance matrix estimator and a direct test for heteroskedasticity. *Econometrica.* 48: 817– 838.

Table 1: Sample Selection and Industry Composition

Panel A: German U.S. GAAP firms selection

Comparability Metrics	*COMP* [1]	*COMP* [2,3]
Data type	Semiannual	Annual
German firms that use U.S.GAAP in 2002, 2003 and 2004; and use IFRS 2006, 2007, 2008, 2009, 2010	74	74
Exclusions:		
Firms with missing price or earnings data	(8)	(5)
Firms that cannot be matched to German IFRS firms based on industry	(3)	(2)
Firms with inadequate match based on size	(16)	(15)
Firms in industries with less than two firms	N/A	(7)
Total number of German U.S. GAAP firms in each sample	47	45

Panel B: Industry composition for German U.S. GAAP firms with COMP [1]

Industry	2-digit SIC	Frequency	Percent
Pharmaceuticals & Chemicals	28	1	2.13
Steel, Iron, and Minerals	33	1	2.13
Industrial Equipment	35	7	14.89
Electronic Equipment	36	6	12.77
Motor Vehicles and Equipment	37	1	2.13
Medical Instruments and Supplies	38	5	10.64
Insurance	63	1	2.13
Holding and Investment	67	1	2.13
Business Services	73	19	40.41
Motion Pictures	78	1	2.13
Management Services	87	4	8.51
Totals		47	100.00

Panel C: Industry composition for German U.S. GAAP firms with COMP [2,3]

Industry	2-digit SIC	Frequency	Percent
Industrial Equipment	35	7	15.56
Electronic Equipment	36	7	15.56
Medical Instruments and Supplies	38	7	15.56
Business Services	73	20	44.43
Management Services	87	4	8.89
Totals		45	100.00

This table presents the sample selection procedure and industry composition for German firms that switched from U.S. GAAP to IFRS in 2005 (i.e. German U.S. GAAP firms). Panel A shows the numbers of German U.S. GAAP firms with semi-annual basis comparability metric *COMP*[1] and annual basis comparability metric *COMP*[2] and *COMP*[3] respectively. Panel B and panel C display the industry compositions for those firms respectively.

.

Table 2: Descriptive Statistics: Input Variables of Comparability Metrics and Firm Characteric Variables

Panel A:Input variables for COMP [1] and firm characteristic variables

	German U.S. GAAP firms (n = 701)			German IFRS firms (n = 694)			U.S. firms (n = 709)					
	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev	*t* -statistic[#]	*t* -statistic[##]	*t* -statistic[###]
NI/P	-0.069	0.021	0.410	-0.050	0.024	0.620	-0.030	0.018	0.229	0.67	0.78	2.54
RET	-0.018	0.031	0.425	-0.019	0.010	0.396	0.004	0.053	0.459	0.06	1.08	0.92
MV	484.969	50.52	1537.49	522.217	55.19	1588.9	485.512	68.61	1408.47	0.44	0.46	0.01
SALESGROW	0.047	0.036	0.361	0.099	0.052	0.345	0.103	0.068	0.347	2.75	0.26	3.01
MB	1.998	1.405	2.555	1.601	1.242	1.368	2.421	1.551	3.486	3.62	5.78	2.60
LEVERAGE	0.429	0.402	0.214	0.539	0.567	0.225	0.402	0.396	0.212	9.39	11.78	2.40

Panel B:Input variables for COMP [2,3] and firm characteristic variables

	German U.S. GAAP firms (n = 347)			German IFRS firms (n = 336)			U.S. firms (n = 339)					
	Mean	Median	Std Dev	Mean	Median	Std Dev	Mean	Median	Std Dev	*t* -statistic[#]	*t* -statistic[##]	*t* -statistic[###]
RET	-0.038	-0.004	0.700	-0.038	-0.01	0.665	-0.007	0.000	0.665	0.00	0.58	0.58
NI/P	-0.035	0.043	0.266	-0.047	0.046	0.302	-0.058	0.035	0.384	0.58	0.41	0.82
ΔNI/P	0.075	0.015	0.394	0.145	0.013	0.646	0.117	0.014	0.587	1.73	0.70	1.01
LOSS	0.352	0.000	0.478	0.333	0.000	0.472	0.372	0.000	0.484	0.50	1.04	0.55
ACC	-0.053	-0.049	0.110	-0.054	-0.034	0.117	-0.067	-0.060	0.134	0.11	1.35	1.40
CFO	0.058	0.066	0.125	0.053	0.05	0.106	0.058	0.074	0.155	0.51	0.47	0.01
MV	216.65	46.11	555.914	171.631	41.65	342.486	299.914	56.01	1140.71	1.27	1.98	1.22
SALESGROW	0.066	0.043	0.415	0.107	0.053	0.391	0.104	0.072	0.380	1.31	0.09	1.25
MB	2.005	1.392	3.312	1.668	1.253	1.621	2.928	1.522	9.012	1.68	2.52	1.79
LEVERAGE	0.408	0.384	0.204	0.520	0.547	0.223	0.394	0.359	0.219	6.87	7.39	0.83

Panel A and Panel B report the descriptive statistics for the input variables used to derive *COMP[1]*, *COMP[2]*, and *COMP[3]*, as well as firm characteristic variables for all three groups of firms used in this study: German U.S. GAAP firms, German IFRS firms, and U.S. firms. In Panel A, *NI/P* is net income per share scaled by the stock price at the beginning of the semi-annual period. *RET* is the semiannual stock return. In Panel B, *RET* is computed from nine months before until three months after fiscal year end (i.e., annual stock return). *NI/P* is the annual net income per share scaled by the stock price at the beginning of the fiscal period. *ΔNI/P* is the annual change in net income per share. *LOSS* is an indicator variable that is equal to 1 if *NI/P* is negative, 0 otherwise. *ACC* is total accruals, calculated as net income less operating cash flows, deflated by lagged total assets. *CFO* is cash flows from continuing operations deflated by lagged total assets. In both Panels A and B, *MV* is the company's total market value, in millions of Euros, at the end of the fiscal period. *SALESGROW* is the percentage change in sales. *MB* is the market-to-book ratio, calculated as the market value of equity divided by the book value of equity. *LEVERAGE* is total liabilities divided by total assets. #, ##, and ### indicate the corresponding *t*-statistic based on the difference in the means (non-directional) between German U.S. GAAP firms and German IFRS firms, between U.S. firms and German IFRS firms, and between German U.S. GAAP firms and U.S. firms, respectively.

Table 3: Descriptive Statistics of Comparability Metrics and Relative Firm Characteristic Ratios for German U.S. GAAP Firm and German IFRS Firm Matched Pairs

Panel A: COMP[1] and firm characteristic ratios for the German U.S. GAAP and IFRS firm matched pairs

	Pre-adoption (n = 263)			Post-adoption (n = 391)				
	Mean	Median	Std Dev	Mean	Median	Std Dev	*t* -statistic	Wilcoxon *Z*
COMP [1]	-0.303	-0.093	0.552	-0.077	-0.047	0.102	-7.90	-6.26
MV_Ratio	2.985	1.128	10.521	1.515	0.910	1.702	2.71	4.42
SALESGROW_Ratio	0.331	0.456	6.178	0.832	0.476	5.614	-1.07	-1.07
MB_Ratio	1.876	1.138	2.217	1.695	1.122	2.073	1.07	0.75
LEVERAGE_Ratio	0.888	0.816	1.275	0.756	0.736	0.925	1.53	1.31

Panel B: The correlations of COMP[1] and firm characteristic ratios for the German U.S. GAAP and IFRS firm matched pairs

	COMP [1]	*POST*	*MV_Ratio*	*SALESGROW_Ratio*	*MB_Ratio*	*LEVERAGE_Ratio*
COMP [1]	1.000	**0.245**	**-0.130**	*0.083*	-0.034	**-0.138**
POST	**0.295**	1.000	**-0.173**	0.042	-0.030	-0.051
MV_Ratio	**-0.326**	**-0.106**	1.000	0.010	**0.461**	*-0.093*
SALESGROW_Ratio	*0.084*	0.042	-0.035	1.000	0.014	-0.152
MB_Ratio	-0.031	-0.042	**0.111**	0.049	1.000	0.060
LEVERAGE_Ratio	**-0.190**	-0.060	0.002	-0.058	**0.105**	1.000

Panel C: COMP[2], COMP[3], and firm characteristic ratios between German U.S. GAAP and IFRS firm matched pairs

	Pre-adoption (n = 126)			Post-adoption (n = 199)				
	Mean	Median	Std Dev	Mean	Median	Std Dev	*t* -statistic	Wilcoxon *Z*
COMP [2]	-0.528	-0.300	0.66	-0.205	-0.100	0.264	-6.17	-6.91
COMP [3]	-0.052	-0.035	0.051	-0.024	-0.017	0.022	-6.62	-4.42
MV_Ratio	3.082	1.186	10.755	1.724	1.124	1.856	1.74	1.99
SALESGROW_Ratio	0.835	0.385	7.281	1.848	0.494	8.617	-1.09	-0.93
MB_Ratio	1.845	1.074	2.285	1.672	1.145	2.003	0.72	-0.16
LEVERAGE_Ratio	0.775	0.746	1.664	0.760	0.681	1.167	0.09	0.62

Panel D: The correlations of COMP[2], COMP[3], and firm characteristic ratios between German U.S. GAAP and IFRS firm matched pairs

	COMP [2]	*COMP* [3]	*POST*	*MV_Ratio*	*SALESGROW_Ratio*	*MB_Ratio*	*LEVERAGE_Ratio*
COMP [2]	1.000	**0.407**	**0.384**	-0.049	0.064	-0.045	0.023
COMP [3]	**0.332**	1.000	**0.245**	-0.067	-0.008	*-0.102*	0.029
POST	**0.325**	**0.346**	1.000	*-0.110*	0.052	0.009	-0.034
MV_Ratio	*-0.125*	-0.056	*-0.096*	1.000	0.014	**0.431**	-0.077
SALESGROW_Ratio	0.013	0.014	0.061	-0.025	1.000	0.058	*-0.140*
MB_Ratio	-0.076	-0.062	-0.040	*0.106*	0.018	1.000	0.023
LEVERAGE_Ratio	-0.063	*-0.124*	-0.005	-0.001	-0.004	**0.164**	1.000

This table presents the descriptive statistics and correlations (Pearson correlation is below while Spearman correlation is above the diagonal) of the comparability metrics and firm characteristic ratios for the German U.S. GAAP and German IFRS firm matched pairs in the pre- (2002-2004) and post- (2006-2010) adoption periods. The last two columns report the statistical differences in the means (*t*-test) and medians (Wilcoxon *z*-test) of these variables across the pre- and post-adoption periods. Panels A and B are based on the semiannual sample. Panels C and D are based on the annual sample. *COMP*[1], *COMP*[2], and *COMP*[3] are the

comparability metrics. All the comparability measures are multiplied by (-1) so that a larger (or less negative) metric value indicates greater comparability. *MV_Ratio*, *SALESGROW_Ratio*, *MB_Ratio*, and *LEVERAGE_Ratio* are the relative market value, sales growth, market-to-book, and leverage ratios of the matched German U.S. GAAP firm and German IFRS firm.

Table 4: Descriptive Statistics of Comparability Metrics and Relative Firm Characteristic Ratios for U.S. Firm and German IFRS Firm Matched Pairs

Panel A: COMP[1] and firm characteristic ratios between U.S. firm and German IFRS firm matched pairs

	Pre-adoption (n = 242)			Post-adoption (n = 411)				
	Mean	Median	Std Dev	Mean	Median	Std Dev	*t*-statistic	Wilcoxon *Z*
COMP [1]	-0.277	-0.109	0.466	-0.088	-0.052	0.102	-7.90	-7.65
MV_Ratio	2.100	1.383	2.622	2.297	1.14	4.178	-0.66	3.74
SALESGROW_Ratio	0.388	0.208	8.363	0.923	0.474	7.627	-0.83	-0.93
MB_Ratio	2.862	1.421	3.981	1.948	1.17	2.99	3.33	3.68
LEVERAGE_Ratio	0.995	0.712	1.208	0.949	0.729	0.855	0.56	0.02

Panel B: The correlations of COMP[1] and firm characteristic ratios between U.S. firm and German IFRS firm matched pairs

	COMP [1]	*POST*	*MV_Ratio*	*SALESGROW_Ratio*	*MB_Ratio*	*LEVERAGE_Ratio*
COMP [1]	1.000	**0.300**	*-0.083*	**0.135**	-0.025	**-0.179**
POST	**0.296**	1.000	**-0.147**	0.036	**-0.144**	-0.001
MV_Ratio	**-0.144**	0.026	1.000	-0.024	**0.334**	0.000
SALESGROW_Ratio	0.047	0.033	**-0.146**	1.000	*-0.070*	*-0.085*
MB_Ratio	0.009	**-0.129**	*0.073*	*-0.079*	1.000	0.053
LEVERAGE_Ratio	**-0.178**	-0.022	0.010	0.061	0.055	1.000

Panel C: COMP[2], COMP[3], and firm characteristic ratios between U.S. firm and German IFRS firm matched pairs

	Pre-adoption (n = 122)			Post-adoption (n = 193)				
	Mean	Median	Std Dev	Mean	Median	Std Dev	*t*-statistic	Wilcoxon *Z*
COMP [2]	-0.760	-0.387	0.965	-0.303	-0.176	0.421	-5.77	-7.64
COMP [3]	-0.067	-0.047	0.049	-0.053	-0.046	0.033	-3.04	-1.97
MV_Ratio	2.098	1.395	2.394	2.704	1.453	4.933	-1.27	1.30
SALESGROW_Ratio	0.539	0.094	7.097	2.296	0.487	11.715	-1.49	-1.35
MB_Ratio	2.69	1.417	3.501	1.93	1.195	2.857	2.10	2.32
LEVERAGE_Ratio	0.914	0.67	1.812	0.948	0.686	0.92	-0.22	-0.05

Panel D: The correlations of COMP[2], COMP[3], and firm characteristic ratios between U.S. firm and German IFRS firm matched pairs

	COMP [2]	*COMP* [3]	*POST*	*MV_Ratio*	*SALESGROW_Ratio*	*MB_Ratio*	*LEVERAGE_Ratio*
COMP [2]	1.000	**0.226**	**0.431**	-0.071	*0.130*	-0.063	-0.074
COMP [3]	**0.385**	1.000	*0.111*	-0.043	-0.061	-0.021	-0.073
POST	**0.310**	**0.169**	1.000	-0.073	0.076	*-0.131*	0.003
MV_Ratio	*-0.142*	-0.086	0.071	1.000	-0.061	**0.355**	0.068
SALESGROW_Ratio	0.052	*-0.120*	0.084	*-0.095*	1.000	-0.047	-0.092
MB_Ratio	-0.034	0.017	*-0.118*	0.037	*0.138*	1.000	0.075
LEVERAGE_Ratio	*-0.101*	-0.075	0.012	0.033	*0.106*	0.051	1.000

This table presents the descriptive statistics and correlations (Pearson correlation is below while Spearman correlation is above the diagonal) of the comparability metrics and firm characteristic ratios for the U.S. firm and German IFRS firm matched pairs in the pre- (2002-2004) and post- (2006-2010) adoption periods. The last two columns report the statistical differences in the means (*t*-test) and medians (Wilcoxon *z*-test) of these

variables across the pre- and post-adoption periods. Panels A and B are based on the semiannual sample. Panels C and D are based on the annual sample. $COMP^1$, $COMP^2$, and $COMP^3$ are the comparability metrics. All the comparability measures are multiplied by (-1) so that a larger (or less negative) metric value indicates greater comparability. *MV_Ratio*, *SALESGROW_Ratio*, *MB_Ratio*, and *LEVERAGE_Ratio* are the relative market value, sales growth, market-to-book, and leverage ratios of the matched U.S. firm and German IFRS firm.

Table 5: Incremental Effects of Adoption on Comparability beyond Convergence

	$COMP^1$		$COMP^2$		$COMP^3$	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-0.621	0.003	-1.125	<.0001	-0.107	<.0001
ADOPT	-0.015	0.731	0.221	0.074	0.015	0.017
POST	0.197	0.003	0.453	<.0001	0.014	0.063
*POST*ADOPT*	0.009	0.859	-0.149	0.227	0.013	0.047
MV_Ratio	-0.013	<.0001	-0.010	0.034	0.000	0.814
SALESGROW_Ratio	0.002	0.059	0.002	0.132	0.000	0.107
MB_Ratio	0.012	0.211	-0.001	0.934	0.000	0.391
LEVERAGE_Ratio	-0.024	0.291	-0.027	0.162	-0.001	0.315
INDUSTRY	Yes		Yes		Yes	
Model	11.7336		24.7129		33.9325	
Adjusted R-square	0.3102		0.2133		0.2953	
Number of Observations	1307		640		640	

This table reports the difference-in-differences results derived from estimating Equation (1), which is used to assess the incremental effect of IFRS adoption from U.S. GAAP on comparability beyond convergence between U.S. GAAP and IFRS.

$$COMP^n_{ij,t} = \alpha_0 + \alpha_1 POST_{ij,t} + \alpha_2 ADOPT_{ij,t} + \alpha_3 POST*ADOPT_{ij,t} + \alpha_4 MV\_Ratio_{ij,t} + \alpha_5 SALESGROW\_Ratio_{ij,t} + \alpha_6 MB\_Ratio_{ij,t} + \alpha_7 LEVERAGE\_Ratio_{ij,t} + INDUSTRY + \varepsilon \quad (1)$$

$COMP^n_{ij,t}$ denotes one of the three comparability metrics ($COMP^1$, $COMP^2$ or $COMP^3$) for the matched pair with firm *i* and firm *j* in period *t* (the subscripts are omitted in the table). $COMP^1$, $COMP^2$ and $COMP^3$ are defined in Tables 3 and 4. A larger (or less negative) metric value indicates greater comparability; *POST* is an indicator variable equal to 1 if year t is after 2005; *ADOPT* is an indicator variable equal to 1 for the matched pairs consisting of a German U.S. GAAP firm and a German IFRS firm; 0 for the matched pairs consisting of a U.S. firm and a German IFRS firm. *MV_Ratio*, *SALESGROW_Ratio*, *MB_Ratio*, and *LEVERAGE_Ratio* are the relative market value, sales growth, market-to-book, and leverage ratios of the matched pairs. *INDUSTRY* represents dummy variables to control for industry fixed effects. Reported *p*-values (two-tailed) are based on the *t*-statistics using the White (1980) heteroskedasticity-adjusted robust variance estimates, further clustered at firm-pair level.

Table 6: Regression Results of Information Transfer

	German U.S. GAAP and German IFRS firm pairs				*German IFRS and U.S. firm pairs*				*Pooled Sample: Incremental Effect*			
	INFORMATION =				*INFORMATION =*				*INFORMATION =*			
	ABS_CAR_A		*ABS_FE_A*		*ABS_CAR_A*		*ABS_FE_A*		*ABS_CAR_A*		*ABS_FE_A*	
	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	0.028	0.004	0.028	0.002	0.030	<.0001	0.025	0.000	0.032	<.0001	0.029	<.0001
INFORMATION	-0.021	0.291	-0.002	0.774	-0.043	0.189	-0.041	0.145	0.004	0.809	-0.005	0.344
POST	-0.012	0.003	-0.008	0.057	-0.009	0.010	-0.006	0.021	-0.015	<.0001	-0.011	0.005
POST*INFORMATION	**0.100**	**0.062**	**0.014**	**0.636**	**0.057**	**0.240**	**0.004**	**0.954**	**0.083**	**0.062**	**0.017**	**0.542**
NUMEST	0.000	0.257	0.000	0.270	0.000	0.861	0.000	0.802	0.000	0.479	0.000	0.782
SIZE	0.000	0.787	0.000	0.941	0.000	0.833	0.000	0.789	0.000	0.968	0.000	0.720
LOSS	0.002	0.524	0.004	0.116	-0.006	0.052	0.006	0.019	-0.003	0.140	0.005	0.005
ADOPT	-	-	-	-	-	-	-	-	-0.004	0.316	-0.005	0.087
*ADOPT*POST*	-	-	-	-	-	-	-	-	0.008	0.076	0.007	0.059
*ADOPT*INFORMATION*	-	-	-	-	-	-	-	-	-0.066	0.063	-0.031	0.291
ADOPT*POST*INFORMATION	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-0.003**	**0.963**	**-0.016**	**0.835**
INDUSTRY	YES		YES		YES		YES		YES		YES	
YEAR	YES		YES		YES		YES		YES		YES	
Model	196.530		157.488		10.278		9.791		250.996		218.956	
Adjusted R-square	0.0941		0.0921		0.0649		0.0659		0.0694		0.0689	
Number of Observations	1,202		1,202		1,925		1,925		3,127		3,127	

This table reports the regression results for information transfer due to IFRS adoption and convergence between IFRS and U.S. GAAP from estimating Equations (5) and (6). All of the continuous variables are winsorized at the top and bottom one percent.

$$ABS\_CAR\_NA_{i,t} = \gamma_0 + \gamma_1 INFORMATION_{j,t} + \gamma_2 POST + \gamma_3 POST*INFORMATION_{j,t} + \gamma_4 NUMEST_{j,t} + \gamma_5 LOSS_{j,t} + INDUSTRY + \varepsilon_{i,t} \quad (5)$$

$$ABS\_CAR\_NA_{i,t} = \gamma_0 + \gamma_1 INFORMATION_{j,t} + \gamma_2 POST + \gamma_3 POST*INFORMATION_{j,t} + \gamma_4 NUMEST_{j,t} + \gamma_5 LOSS_{j,t} + \gamma_6 ADOPT + \gamma_7 POST*ADOPT + \gamma_8 ADOPT*INFORMATION_{j,t} + \gamma_9 POST*ADOPT*INFORMATION_{j,t} + INDUSTRY + \varepsilon_{i,t} \quad (6)$$

CAR_NA is the cumulative abnormal return of a non-announcing firm *i* to measure the market reaction of the non-announcing firms surrounding corresponding announcing firm *j*'s earnings announcement (-1,+1). *ABS_CAR_NA* is absolute value of *CAR_NA*. *INFORMATION* is equal to either the matched announcing firm *j*'s absolute value of abnormal stock returns (*ABS_CAR_A*) or analyst forecast error (*ABS_FE_A*). *ABS_CAR_A* is the absolute value of abnormal stock returns of announcing firm surrounding its earnings announcement (-1,+1); *ABS_FE_A* is the absolute value of announcing firm's analyst forecast error, measured as the difference between actual earnings and the most recent median earnings forecast, scaled by stock price at the beginning of the year; *POST* is an indicator variable equal to 1 if year *t* is after 2005, 0 otherwise. *ADOPT* is an indicator variable equal to 1 for the matched pairs consisting of German U.S. GAAP and German IFRS firms, 0 for the matched pairs consisting of U.S. firm and German IFRS firm. *NUMEST* is equal to the number of analysts providing forecast information for firm *j* in year *t*; *LOSS* is an indicator variable equal to 1 if firm *j* reports negative earnings in year *t,* 0 otherwise. *INDUSTRY* represents dummy variables to control for industry fixed effects. Reported *p*-values (two-tailed) are based on *t*-statistics using the White (1980) heteroskedasticity-adjusted robust variance estimates.

Table 7: Incremental Effects of Adoption on Comparability beyond Enforcement

	$COMP^1$		$COMP^2$		$COMP^3$	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-0.748	0.001	-1.005	0.019	-0.092	<.0001
ADOPT_ENF	0.150	0.187	-0.059	0.513	-0.015	0.006
POST	0.286	0.000	0.143	0.197	0.010	0.055
*POST*ADOPT_ENF*	-0.096	0.363	0.176	0.095	0.018	0.045
MV_Ratio	-0.077	0.008	0.002	0.666	0.000	0.099
SALESGROW_Ratio	0.006	0.031	-0.019	0.390	0.000	0.805
MB_Ratio	0.016	0.181	-0.002	0.683	0.000	0.849
LEVERAGE_Ratio	-0.002	0.894	0.000	0.853	0.000	0.850
INDUSTRY	Yes		Yes		Yes	
Model	6.47		13.3711		63.689	
Adjusted R-square	0.3973		0.1693		0.3929	
Number of Observations	1171		573		573	

This table reports the difference-in-differences results from estimating Equation (8), which is used to assess the incremental effect of IFRS adoption from U.S. GAAP on comparability beyond what may be caused by enforcement. The enforcement effect is derived from changes in comparability between matched pairs of German IFRS firms.

$$COMP^n_{ij,t} = \alpha_0 + \alpha_1 POST_{ij,t} + \alpha_2 ADOPT\_ENF_{ij,t} + \alpha_3 POST*ADOPT\_ENF_{ij,t} + \alpha_4 MV\_Ratio_{ij,t} + \alpha_5 SALESGROW\_Ratio_{ij,t} + \alpha_6 MB\_Ratio_{ij,t} + \alpha_7 LEVERAGE\_Ratio_{ij,t} + INDUSTRY + \varepsilon \quad (8)$$

$COMP^n_{ij,t}$ denotes one of the three comparability metrics ($COMP^1$, $COMP^2$ or $COMP^3$) for the matched pair with firm *i* and firm *j* in period *t* (subscripts are omitted in the table). $COMP^1$, $COMP^2$ and $COMP^3$ are defined in Tables 3 and 4. A larger (or less negative) metric value indicates greater comparability; *POST* is an indicator variable equal to 1 if year t is after 2005; *ADOPT_ENF* is an indicator variable equal to 1 for the matched pairs consisting of a German U.S. GAAP firm and a German IFRS firm; 0 for the matched pairs consisting of a German IFRS firm and another German IFRS firm. *MV_Ratio*, *SALESGROW_Ratio*, *MB_Ratio*, and *LEVERAGE_Ratio* are the relative market value, sales growth, market-to-book, and leverage ratios of the matched pairs. *INDUSTRY* represents dummy variables to control for industry fixed effects. Reported *p*-values (two-tailed) are based on the *t*-statistics using the White (1980) heteroskedasticity-adjusted robust variance estimates, further clustered at firm-pair level.

Table 8: Comparability between German U.S. GAAP firms and U.S. firm after IFRS adoption

	$COMP^1$		$COMP^2$		$COMP^3$	
	Estimate	p-value	Estimate	p-value	Estimate	p-value
Intercept	-0.541	0.003	-1.444	<.0001	-0.119	<.0001
REVERSE	0.059	0.338	0.126	0.147	0.013	0.006
POST	0.185	0.002	0.477	0.000	0.014	0.059
*POST*REVERSE*	-0.064	0.301	-0.243	0.046	-0.011	0.050
MV_Ratio	-0.007	0.052	-0.022	0.066	-0.001	0.025
SALESGROW_Ratio	0.000	0.967	0.004	0.219	0.000	0.335
MB_Ratio	0.013	0.144	0.010	0.011	0.000	0.771
LEVERAGE_Ratio	-0.001	0.950	0.002	0.873	0.001	0.514
INDUSTRY	Yes		Yes		Yes	
Model	6.706		13.5905		39.904	
Adjusted R-square	0.2462		0.2041		0.3003	
Number of Observations	1,313		642		642	

This table reports the difference-in-differences results from estimating Equation (9), which is used to assess whether the depart from using U.S. GAAP has reduced the comparability between German U.S. GAAP firms and U.S. firms, with the control of effects from convergence between IFRS and U.S. GAAP on comparability.

$$COMP^n_{ij,t} = \alpha_0 + \alpha_1 POST_{ij,t} + \alpha_2 REVERSE_{ij,t} + \alpha_3 POST*REVERSE_{ij,t} + \alpha_4 MV\_Ratio_{ij,t} + \alpha_5 SALESGROW\_Ratio_{ij,t} + \alpha_6 MB\_Ratio_{ij,t} + \alpha_7 LEVERAGE\_Ratio_{ij,t} + INDUSTRY + \varepsilon \quad (9)$$

$COMP^n_{ij,t}$ denotes one of the three comparability metrics ($COMP^1$, $COMP^2$ or $COMP^3$) for the matched pair with firm *i* and firm *j* in period *t* (the subscripts are omitted in the table). $COMP^1$, $COMP^2$ and $COMP^3$ are defined in Tables 3 and 4. A larger (or less negative) metric value indicates greater comparability; *POST* is an indicator variable equal to 1 if year t is after 2005; *REVERSE* is an indicator variable equal to 1 for the matched pairs consisting of a German U.S. GAAP firm and a U.S. firm; 0 for the matched pairs consisting of a U.S. firm and a German IFRS firm. *MV_Ratio*, *SALESGROW_Ratio*, *MB_Ratio*, and *LEVERAGE_Ratio* are the relative market value, sales growth, market-to-book, and leverage ratios of the matched pairs. *INDUSTRY* represents dummy variables to control for industry fixed effects. Reported *p*-values (two-tailed) are based on the *t*-statistics using the White (1980) heteroskedasticity-adjusted robust variance estimates, further clustered at firm-pair level.

Table 9: Adoption and Convergence Effects

Panel A: Accounting Differences

Company	Accounting differences	|Difference in NI|	|NI (USGAAP)|	Percentage	|Difference in EQ|	|EQ(USGAAP)|	Percentage
SYZYGY AG	1	40	2,895	1.38%	0	55,737	0.00%
DIALOG SEMICONDUCTOR PLC	1,2,3	533	5,743	9.28%	12,908	121,135	10.66%
SINNERSCHRADER AG	1	8	531	1.51%	0	8,054	0.00%
JUBII EUROPE NV		0	45,476	0.00%	0	146,198	0.00%
PFEIFFER VACUUM TECHNOLOGY AG	1, 4, 5, 6	159	22,748	0.70%	633	112,631	0.56%
INTERSHOP COMMUNICATIONS AG	1, 7	145	8,921	1.63%	0	2,655	0.00%
REALTECH AG		0	1,760	0.00%	0	42,442	0.00%
CONTINENTAL AG	7, 8	61,000	1,096,400	5.56%	94,900	2,842,300	3.34%
LEONI AG	8, 9, 10, 11, 12	5,551	33,225	16.71%	6,437	371,340	1.73%
GFK AG	1, 2, 5, 7, 8, 13, 14	10,367	63,502	16.33%	8,036	264,786	3.03%
EVOTEC AG	9,10	6,391	84,203	7.59%	8,498	102,010	8.33%
CEOTRONICS AG	1,3	51	1,001	5.09%	63	10,756	0.59%
ARTNET AG	1	8	518	1.54%	0	1,056	0.00%
JUNGHEINRICH AG	5,7, 8, 14	3,760	45,568	8.25%	8,057	391,772	2.06%
CLAAS KGAA	1,5,6,7, 8	380	21,497	1.77%	62,730	311,641	20.13%
Average (1,000 Euros or %)		5,893	95,599	**5.16%**	13,484	318,968	**3.36%**

Note:

Accounting difference	Issues	Total # of incurance
1*	Stock based compe	9
2	Goodwill	2
3	Intangible assets	2
4	Valuation	1
5*	Income tax	3
6	Minority interest	2
7*	Research and Devel	4
8*	Pension	5

Accounting difference	Issues	Total # of incurance
9*	Impairment of fixed assets	2
10*	Impairment of intangiable assets (including goodwill)	2
11	Sales from development contract	1
12	Depreciation	1
13	Provision	1
14	Consolidation	2
15	Leases	1

Panel B: Adoption Compliance Test

Topic	Subtopic	Criteria Tested	Applicable to:	Percent Compliant
Stock-based Compensation			7 firms	
	Measurment Compliance	Does the entity state that equity investments are valued as the fair value of goods/services received?	N/A	N/A
	Disclosure Compliance	Does the entity provide general description of stock-based compensation arrangements?	7	100%
		Does the entity provide a description of determination of "fair value of goods or services received"?	N/A	N/A
		Does the entity disclose the effect on Profit / Loss for the current period?	7	100%
Pensions & Post-employment Benefits			9 firms	
	Measurment Compliance	Does the entity state that post-employment benefits are recognized at net present value of future oblivations?	7	78%
	Disclosure Compliance	Does the entity provide general description of post-employment benefit plans?	9	100%
		Does the entity disclose methods used to determine actuarial gains/loss?	9	100%
		Does the entity provide a reconciliation between actual and book pension liability?	5	56%
		Does the entity provide reconciliation between the beginning and end of the period value of the pension obligation?	6	67%
Asset Impairments			13 firms	
	Measurment Compliance	Does the entity disclose determination of the recoverable amount?	13	100%
		Does the entity disclose use of an annual impairment test for goodwill?	12	92%
	Disclosure Compliance	Is basis for determining "value in use" disclosed?	13	100%
		Is basis for determining "fair value less cost to sell" disclosed?	13	100%
Intangible Assets			15 firms	
	Measurment Compliance	The entity does **NOT** capitalize research, start-up, or advertising costs	15	100%
		Does the entity directly state that it *generally* expenses R&D?	14	93%
	Disclosure Compliance	Is useful life and/or amortization rate disclosed?	15	100%
		Is the amortization method disclosed?	15	100%
		Does the entity provide a reconciliation of the carrying amount of intangibles from the beginning to the end of the period?	15	100%
Business Combinations			6 firms	
	Measurment Compliance	Does the entity disclose use of the acquisition (purchase) method?	6	100%
		Does the entity disclose use of the recognition principle or the measurement principle in valuing acquired assets and assumed liabilities? (Directly or indirectly)	6	100%
		Does the entity separately disclose any capitalized goodwill (recognized gain on bargain purchases)?	5	83%
	Disclosure Compliance	Does the entity disclose detailed information about the acquired companies and related accounts?	6	100%

Panel C: Convergence Compliance Test

Topic	Subtopic	Criteria Tested (based on IFRS)	US GAAP		IFRS	
			Applicable to:	Percent Compliant	Applicable to:	Percent Compliant
Stock-based Compensation			15 firms		6 firms	
	Measurment Complian	Does the entity state that equity investments are valued as the fair value of goods/services received?	N/A	N/A	N/A	N/A
	Disclosure Compliance	Does the entity provide general description of stock-based compensation arrangements?	15	100%	6	100%
		Does the entity provide a description of determination of "fair value of goods or services received"?	15	100%	5	83%
		Does the entity disclose the effect on Profit / Loss for the current period?	14	93%	5	83%
Discontinued Operations			4 firms		1 firm	
	Measurment Complian	None				
	Disclosure Compliance	Does the entity report net profit/loss from discontinued operations on the face of income statement?	4	100%	1	100%
		Does the entity separately disclose the net profit/loss from discontinued operations from continuing operations?	4	100%	1	100%
		Does the entire disclose the adjustments to discontinued operation in prior year separately?	N/A	N/A	N/A	N/A
		Does the entity reclassify and included discontinued operations in income from continuing operations when they are ceased?	N/A	N/A	N/A	N/A
Borrowing Costs			0 firms		2 firms	
	Measurment Complian	Does the entity only consider the costs directly attributable to the acquisition, construction, and production of a qualifying asset	0	0%	2	100%
	Disclosure Compliance	Does the entity disclose the amount of borrowing costs capitaled during the period?	0	0%	2	100%
		Does the entity diclose the capitalization rate used?	0	0%	2	100%

Panel C: Convergence Compliance Test (Cont.)

Topic	Subtopic	Criteria Tested (based on IFRS)	US GAAP		IFRS	
			Applicable to:	Percent Compliant	Applicable to:	Percent Compliant
Segmental Reporting			12 firms		13 firms	
	Measurment Complian	Does the entity disclose management decision approach?	4	33%	13	100%
	Disclosure Compliance	Does the entity disclose how operating segments are identified?	12	100%	13	100%
		Does the entity disclose the judgements made by management in applying the aggregation criteria?	4	33%	1	8%
		Does the entity disclose the profit or loss for each reportable segment?	12	100%	13	100%
		Does the entity disclose the total asset and liability for each reportable segment?	12	100%	12	92%
		Does the entity provide the information about the measurement of segment profit or loss, segment assets and segment liabilitie?*	3	25%	5	38%
		Does the entity provide a reconciliation of the totals of segment revenues, profit or loss, assets, and liabilities?	6	50%	9	69%
		Does the entity provide Information about each product and service or groups of products and services?	11	92%	13	100%
		Does the entity provide analyses of revenues and certain non-current assets by geographical areas?	10	83%	13	100%
		Does the entity provide information about the transaction with major customers?	6	50%	6	46%
Business Combinations			3 firms		2 firms	
	Measurment Complian	Does the entity disclose use of the acquisition (purchase) method?	3	100%	0	0%
		Does the entity disclose use of the recognition principle or the measurement principle in valuing acquired assets and assumed liabilities?	3	100%	2	100%
		Does the entity separately disclose any capitalized goodwill (recognized gain on bargain purchases)?	3	100%	1	50%
	Disclosure Compliance	Does the entity disclose detailed information about the acquired companies and related accounts?	3	100%	2	100%
		Does the entity report any follow-up information related to adjustments of past business combinations?	N/A	N/A	1	50%

This table summarizes our findings based on data hand-collected from firms' financial statements. In Panel A, we examine the overall impact of IFRS adoption on firms' net income and equity based on the 15 accounting differences listed. This data is collected from German U.S. GAAP firms' reconciliation disclosure of previously reported U.S. GAAP and restated IFRS financial statements.

In Panel B, we examine compliance with measurement and disclosure requirements for five major accounting differences affected by IFRS adoption by German U.S. GAAP firms. Data is collected from firms' 2006 financial statements that are provided in English. Each question or criteria listed is based on the IASB's listed disclosure requirements for each individual accounting standard.

Similarly, in Panel C, we examine compliance with U.S. GAAP by U.S. firms and IFRS by German IFRS firms. These firms include 15 randomly selected German IFRS firms and their matched U.S. firms. The standards tested for compliance are based on the accounting differences found to be potentially significant based on our analysis in Panel A.

In both Panels B and C, the percent compliant are based on the total number of firms to which the standard is applicable. N/A indicates that while the overall standard was applicable to some firms, the individual criteria was not.