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Holger Daske

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Holger Daske[†]

ECONOMIC BENEFITS OF ADOPTING IFRS OR US-GAAP - HAVE THE EXPECTED COSTS OF EQUITY CAPITAL REALLY DECREASED?[*]

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[†] Holger Daske, Professur für Betriebswirtschaftslehre, insb. Wirtschaftsprüfung (Accounting and Auditing), J.W. Goethe-Universität Frankfurt am Main, Mertonstr. 17-25, D-60325 Frankfurt/M.
e-mail: daske@wiwi.uni-frankfurt.de

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Abstract

The question whether the adoption of International Financial Reporting Standards (IFRS) will result in measurable economic benefits is of special policy relevance in particular given the European Union's decision to require the application of IFRS by listed companies from 2005/2007. In this paper, I investigate the common conjecture that internationally recognized high quality reporting standards (IAS/IFRS or US-GAAP) reduce the cost of capital of adopting firms (e.g. Levitt 1998; IASB 2002). Building on Leuz/Verrecchia (2000), I use a set of German firms which pre-adopted such standards before 2005, but investigate the potential economic benefits by analyzing their expected cost of equity capital utilizing and customizing available implied estimation methods (e.g. Gebhardt/Lee/Swaminathan 2001, Easton/Taylor/Shroff/Sougiannis 2002, Easton 2004).
Evidence from a sample of about 13,000 HGB, 4,500 IAS/IFRS and 3,000 US-GAAP firm-month observations in the period 1993-2002 generally fails to document lower expected cost of equity capital and therefore measurable economic benefits for firms applying IAS/IFRS or US-GAAP. Accordingly, I caution to state that reporting under internationally accepted standards, per se, lowers the cost of equity capital of adopting firms.

JEL Classification: M41

1. Introduction

The mandatory adoption of IFRS by listed companies in the European Union (EU) from 2005/2007 is an important step towards the evolution of global standards of accounting and shall ensure high quality and comparability across the EU countries (see Regulation (EC) No 1606/2002). The nature of potential economic benefits of that decision remains a subject of discussion, however. Regulators, financial statement preparers and users alike have commonly expressed the view that higher accounting quality and disclosure under internationally recognized standards such as IAS/IFRS or US-GAAP lower the cost of capital of adopting firms. The former SEC chairman Arthur Levitt once summarized this view by stating that "The truth is, high standards lower the cost of capital" (Levitt 1998).

This view has traditionally been based on the theory that higher information quality either lowers the estimation risk of future returns (e.g. Clarkson/Guedes/Thompson 1996) or that it lowers the information asymmetries between managers and outside investors, thus increases liquidity and ultimately lowers the required rates of return (e.g. Diamond/Verrecchia 1991). However, more recent analytical research has shown that this relationship does not hold under all conditions (Barth/Clinch/-Shibano 1999). Further, empirical evidence on the association between disclosure and the cost of capital has produced mixed evidence so far, either measured within an accounting regime (e.g. Botosan 1997) or across different accounting regimes (Leuz/Verrecchia 2000, Leuz 2003). To summarize, it is neither theoretically nor empirically clear that international reporting per se lowers the cost of capital (Ewert 1999).

My study addresses this issue empirically by taking advantage of the recent transition process in Germany in which a considerable number of firms started to report their results under IAS/IFRS or US-GAAP instead of local financial reporting standards (HGB). For these firms, I measure the effect of this reporting strategy on their expected cost of equity capital. The German setting is particularly suitable for such an experiment as we have here worldwide the highest number of IFRS adopters as of today and the effects should be particularly strong given the the reputation of German accounting as one of the most discrete in the EU, if not worldwide.

Whereas Leuz/Verrecchia (2000) and Leuz (2003) examine bid/ask-spreads, trading volume and share price volatility as proxies for the information asymmetry component of the cost of equity capital, I extend the literature by estimating *directly* the expected cost of equity capital effects applying recent advances in accounting and finance in determining the cost of equity capital as an implied rate of return of a valuation model utilizing consensus earnings forecasts and share price. I employ both empirical implementations of the Residual Income Valuation model (RIV, Gebhardt/Lee/Swaminathan (GLS) 2001; Easton/Taylor/Shroff/Sougiannis (ETSS) 2002) and of the Capitalized Earnings model of Ohlson/Juettner-Nauroth (2000) (OJN, Gode/Mohanram 2002, Easton 2004). These can be considered the current "state-of-the-art" estimation methods and have specific complementing features (see Hail/Leuz 2003).

I further extend these estimation procedures for the specific needs of research measuring the effect of a specific event, such as the switch in the reporting standards, on a firm's required rates of return: First, I propose a method for monthly (instead of yearly) estimation which increases sample size and thus statistical power when using the RIV model (utilized in GLS 2001 and ETSS 2002). Second, I put forward bootstrapped sampling procedures in order to test for significant differences in the parameters when simultaneously estimating the expected cost of equity capital and the long-term growth rate of earnings in a regression framework for a portfolio of stocks before and after the event (utilized in ETSS 2002 and Easton 2004).

Applying this methodology to a set of around 75 switch- and 280 initial international reporting firms and a total sample size of about 13,000 HGB, 4,500 IAS/IFRS and 3,000 US-GAAP firm-month observations in the period from 1993 to 2002, I fail to document lower expected cost of equity capital for firms pre-adopting an international reporting strategy; this result holds equally for IAS/IFRS and for US-GAAP adopters. In cross-sectional regressions of the expected cost of equity capital estimates on reporting dummies (IAS/IFRS; US-GAAP) and on variables controlling for other risk factors (e.g. beta, size, book-to-market), the reporting dummies show to be insignificant whereas the relevant control variables generally show up to be significant in the hypothesized direction. Applying time-series analysis, I compare the absolute and relative risk premium for the switch companies' one/two/three years before to after the switch "event" and find

statistically significant increases in the absolute risk premia, but insignificant changes in the relative risk premia after non-local GAAP adoption when controlling for the general market trend. When using simultaneous estimation methods (ETSS 2002 and Easton 2004) combined with data-based simulation on the switch firms' subset, I find again rising cost of equity capital post IAS/IFRS and US-GAAP adoption. Finally, when comparing over a period from 1997 to 2001 two portfolios of firms from similar industries measured yearly at the same points in time, but reporting under local versus under international standards, I find inconclusive results for the two portfolios. Accordingly, given these results based on a variety of different empirical tests showing either unchanged or even increasing cost of equity capital after international GAAP adoption, I would rather caution to state that international reporting, per se, lowers the cost of equity capital of adopting firms.

In sum, my research contributes to the discussion of the potential economic consequences of introducing IFRS globally and in particular in the EU by 2005/2007. The remainder of the paper is organized as follows: Section 2 discusses potential economic consequences of introducing IFRS. Section 3 presents the research design, the data sample and finally my results utilizing the German setting. Section 4 concludes.

2. Economic Consequences of Introducing IFRS

The importance of IFRS is clearly documented in the most recent "GAAP convergence" survey in 2002 revealing that 95 percent of the 59 surveyed countries either have adopted intend to adopt, or intend to converge with IFRS for publicly traded companies.[1] In particular, the European Union (EU) requires listed companies to adopt IFRS by 2005/2007. This Regulation (EC) No 1606/2002 of July 2002 represents a most significant change in the nature and level of EU reporting requirements since the start of the EU accounting harmonization efforts and was labelled an accounting revolution (Wagenhofer 2003, p. 1). Given the size and importance of the EU capital markets, it is also considered a key step towards the evolution of a global set of accounting standards.

[1] See GAAP Convergence (2002). See also IASB (2002a), p. 2 for a list of counties adopting IFRS around the world. The FASB and the IASB have a formal liaison relationship ("The Norwalk Agreement") and a short-term convergence project on their agendas. See IASB (2002b), p. 1.

The nature of economic benefits and costs of adopting IFRS within and across countries remains a subject of discussion, however (see Pownell/Schipper (1999) and Schipper (2000) for a discussion). Still, a benefit versus cost analysis is key when assessing the quality of accounting standards and when rationalizing IFRS in favour of local standards customized according to the needs of a particular financial system.[2] While the direct cost of adopting IFRS in the firm's accounting systems have been estimated by adopting firms and/or their consultants in applied business journals[3], the total economic costs[4] and particularly benefits are even more difficult to quantify.[5] The increased transparency and quality as compared to most local reporting requirements as well as the perceived increased comparability of financial reports under IFRS across countries and markets should make it less difficult and costly for investors to compare the opportunities and risk involved in investments in global markets. While these are not ends in themselves, transparency and comparability should ultimately result in lower rates of return investors require for providing funds and thus in lower cost of capital for adopting firms.

Decreasing cost of capital as an underlying rationale has often been expressed by the IASB[6], regulators around the globe adopting IFRS[7], and has also been put forward to reason the EU's decision. For example, Fritz Bolkestein, the European Commissioner for Internal Markets, assessed that IFRS are "vital because a single set of accounting standards will help reduce the cost of capital".[8] Straighter to the point, Arthur Levitt, the former SEC Chairman, once summarized "The truth is, high quality standards lower the cost of capital".[9] The motivation and claim that international reporting standards are expected to lower the adopter's cost of capital nowadays are commonly found in the media and applied business journals[10] and is

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[2] See, for example, the AAA's Financial Accounting Standards Committee (1998), also Gebhardt (2000).
[3] See, for example, Köhler/Marten/Schlereth/Crampton (2003), pp. 2619-2620.
[4] In addition to the direct cost of transforming a firm's accounting system, there can be further indirect such as proprietary cost. For a discussion, see, for example, Breker/Naumann/Tielmann (1999), p. 148.
[5] See, for example, Ballwieser, W., "Rechnungslegung im Umbruch", *Frankfurter Allgemeine Zeitung*, March 3, 2004.
[6] See IASB (2002a), p. 6.
[7] See, for example, the Australian Financial Reporting Council, on: http://www.frc.gov.au/content/info_paper.asp.
[8] Quoted from Bolkestein, F. "One currency, one accounting standard: Unless the European Union adopts a single set of rules, it risks losing the benefits of the euro", *Financial Times*, June 14, 2000.
[9] Quoted from Levitt (1998), p. 82.
[10] See, for example, Schindler, J./Schurbohm, A., "Mit IAS das babylonische Sprachengewirr beenden", *Frankfurter Allgemeine Zeitung*, April 9, 2001.

frequently referred to by the involved parties in Europe, particularly in countries where companies have already adopted international reporting. This thought equally applies to financial statement preparers,[11] financial analysts,[12] or auditors.[13]

Academic research, however, has found it difficult to document systematically the perceived benefits and the accomplishments of the declared objectives of introducing IFRS when using data of firm's which already have adopted some form of international reporting (IAS/IFRS or US-GAAP). While some studies have focused on the intermediate goals of achieving comparability (Chen/Sun/Wang 2002) or increased transparency and accounting quality (Ball/Robin/Wu 2003), research trying to estimate the effects on the ultimate goal of achieving measurable economic benefits in form of a reduction of the firm's cost of capital is still scarce (Leuz/Verrecchia 2000, Leuz 2003).

2.1. Financial Reporting, Information Quality and the Cost of Capital

There are two key premises which establish a connection between the adoption of international reports and a reduction in firm's cost of capital: First, financial reporting under IFRS and/or US-GAAP must lead to higher information quality as compared to local GAAP. Second, higher information quality must ultimately effect and reduce a firm's cost of capital.

The claim of higher information quality of IFRS and US-GAAP as compared to accounting regimes outside the "Anglo-Saxon" sphere is based on the higher quantity of required disclosures as well as the supposed higher information content of their accounting numbers. Within the EU, this specifically applies to the Continental European countries with a French or German accounting origin which have been criticised as too discrete and too heavily influenced by tax avoidance strategies (see Leuz/Verrecchia 2000).

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[11] See, for example, Pellens/Tomaszeweski (1999), p. 201-203, Stahl (2002), p. 34.
[12] See, for example, Marten/Schlereth/Crampton/Köhler (2002), p. 2010. This survey was conducted with the German Association of Security Analysts (DVFA Deutsche Vereinigung für Finanzanalyse und Asset Management).
[13] See Breker/Naumann/Tielmann (1999), p. 145 from the German Association of Chartered Accountants (IDW Institut der Wirtschaftsprüfer) or Illingworth (2003) for the Institut of Chartered Accountants in England & Wales.

That both IFRS and US-GAAP require higher levels of disclosure than local regulations in these Continental European countries can be considered generally accepted.[14] This understanding equally applies today to the business community[15] and regulators[16] as academic studies have largely supported this view when comparing disclosure rules of these different reporting standards as well as actual disclosures in annual reports of companies applying either local GAAP, IAS/IFRS or US-GAAP.[17] But IFRS and US-GAAP have not only added disclosure requirements, they also have different recognition and measurement rules affecting the accounting numbers. Whether these rules possess higher information quality, however, is still subject to intense discussions in the EU.[18] For example, the French President Jacque Chirac has recently questioned the quality of IFRS.[19] Empirically, the vast majority of studies applying a variety of empirical experiments support the notion that US-GAAP have higher information quality in their earnings than Continental European accounting regimes.[20] Since IAS/IFRS figures empirically are documented to be closer to US-GAAP than any other accounting regime (e.g. Harris/Muller 1999), similar better-quality properties are predicted.

Whether IFRS or US-GAAP, "the two leading contenders in the global competition among financial reporting regimes" (Leuz 2003, p. 446), are really of comparable information quality or whether US-GAAP is superior to IFRS is another controversy.[21] While proponents of IFRS argue that their quality have improved substantially over time especially with the completion of the Comparability/Improvement Project, are now relatively close to US-GAAP with only minor differences remaining and give sufficient disclosures which allow

[14] Note however, that although former studies in the field assume that higher information quantity also increases information quality that does not necessarily has to be the case. See Botosan/Plumlee (2002) or Schrand/Verrecchia (2002).
[15] For example in Germany, 89% of the surveyed financial analysts in Köhler/Marten/Schlereth/Crampton (2002), p. 2008 and 84% of the surveyed company representatives in Köhler/Marten/Schlereth/Crampton (2003), p. 2616, agree that IFRS or US-GAAP have higher transparency and a higher quantity of disclosure than local HGB standards.
[16] See, for example, Van Hulle (2003).
[17] See, for example, Ballwieser (1997). For detailed comparision, Born (2002); Hayn/Graf Waldersee (2002). Note that this result is documented despite the finding that many firms do not fully comply with all disclosure rules. See Glaum/Street (2002) or Gebhardt/Heilmann (2004).
[18] See, for example, Schildbach (2004) for questioning IFRS in the Continental European institutional setting.
[19] See, for example, AccountancyAge.com, "Poor old Jacque Chirac", www.accountancyAge.com, July 31, 2003.
[20] These include value relevance studies (e.g. Harris/Lang/Möller 1994) or timeliness and conservatism studies (e.g. Ball/Kothari/Robin 2000).
[21] For similarities and differences between IFRS and US-GAAP, see The IASC-U.S. Comparison Project (1999).

investors to draw their own conclusion in case of divergence, IFRS opponents argue that still material differences between the two standards remain and US-GAAP are still better-quality since IFRS are less detailed, allow higher flexibility and require fewer disclosures (see Leuz 2003 for an in-depth discussion). Empirically, however, the few studies available generally do not support the claims that US-GAAP produce financial statements of higher information quality. Although Harris/Muller (1999) do find that US-GAAP are incrementally value relevant to IAS when examining Form 20-F reconciliations to US-GAAP, Ashbaugh/Olssen (2002) find similar value relevance for IAS and US-GAAP when looking at a sample of non-US firms listed on London's SEAQ. On top, taking quality one step further and analyzing potential different economic consequences, Leuz (2003) finds statistically insignificant and only economically small differences in bid-ask spread and share turnover between IAS and US-GAAP adopting firms at Germany's former New Market.

This result would also be consistent with an alternative view that rather than by the reporting standards, accounting quality is predominately determined by a firm's reporting incentives created by its institutional environment and market forces (Leuz/Nanda/Wysocki 2003, Ball/Robin/Wu 2003). Applied to the EU case and given the similar reporting incentives preparers face after adopting IFRS or US-GAAP, this view would expect similar accounting quality within a country irrespectively of the reporting regime applied (local GAAP, IFRS or US-GAAP).

Despite these concerns, it can still be considered the predominant view that IFRS and/or US-GAAP being customized towards the needs of outside investors have higher information quality for public capital markets than most local regimes as it forms the basis for the increasing acceptance or adoption of IFRS globally. Whether higher information quality, however, ultimately effects and decreases the cost of capital is yet another question. Although there is no role for such additional information in the CAPM context, three main streams of analytical research have provided possible explanations based on either liquidity risk, estimation risk or misalignment risk in investment decisions.

The first stream links information quality and cost of capital through the effects of voluntary disclosure on a stock's liquidity (see Verrecchia 2001 for a survey). In these models, less-informed investors may be forced to trade with better-informed

market participants in case of future liquidity shocks. These information asymmetries introduce adverse selection into stock transactions and hence reduce market liquidity. Thus, in order to motivate unwilling potential investors to acquire shares in illiquid markets, firms must issue their shares at a discount, which results in fewer funds raised and hence higher cost of capital. A firm's commitment to increased disclosure which turns private into public information, in turn, reduces information asymmetries among market participants, increases liquidity, and hence reduces the cost of capital (see Diamond/Verrecchia 1991, Baiman/Verrecchia 1996). This disclosure effect, however, is not as clear when incorporating a third party of rational investors which individually decide whether to acquire private information or not. When based on more precise financial statement information these investors' cost of getting informed decrease more than their benefits for such activity decline, this "expertise acquisition" effect may result in even more private information acquisition, thus less liquidity and higher cost of capital in case it overcompensates the basic "direct GAAP" effect (Barth/Clinch/Shibano 1999). In sum, under these types of models, the final effect largely depends on the constellations of the model parameters and remains an empirical question (Ewert 1999). Still, the effect of decreasing cost of capital when public disclosure mitigates private information is more recently underlined by Easley/O'Hara (2004) using a different type multi-assets rational expectations model.

The second stream of theoretical research claims that higher information quality lowers a firm's cost of capital by reducing nondiversifiable estimation risk. As investors have to estimate the parameters of a security's return or its payoff-distribution based on available information when forming an optimal portfolio, they face estimation risk in addition to the systematic risk they bear (e.g. Coles/-Loewenstein/Suay 1995). Additional information can reduce estimation risk and thus will be rewarded by risk-averse investors. However, as there is much discussion about the diversibility and pricing of such estimation risk when aggregating across firms in a portfolio (Clarkson/Guedes/Thompson 1996), its validity remains largely an empirical question.

The last and most recent stream probably provides the most direct theoretical link between the quality of information in financial statements and the cost of capital. Leuz/Verrecchia (2004) present a capital market model with rational expectations in which better information improves the coordination between firms and outside

investors regarding a firm's investment decisions and thus reduces misalignment risk between the two parties. In this scenario, higher information quality affects not only investors' perception of a firm's future cash flows, but instead market participants are also better enabled to affect the firm's real decisions and future cash flows. Anticipating this effect, investors will consequently require a lower risk premium for high-quality reporting firms, even when aggregating across firms in a portfolio.

Empirical research has tested these theoretical predictions by analysing the relationship between information quality of financial statements, measured both within and across GAAP regimes, and a firm's cost of capital, estimated either directly or by using related proxies.

When measuring different levels of information quality within a GAAP regime, one line of investigation documents that higher voluntary disclosure can lead to a reduction in a firm's cost of equity capital (Botosan 1997, Hail 2002) and cost of public debt (Sengupta 1998). However, this evidence is rather weak and highly depends on research specification (Botosan/Plumlee 2002). The second area shows in addition that firms with certain desirable properties of earnings which increase information quality exhibit empirically lower expected cost of equity capital (Francis/LaFond/Olsson/Schipper 2003).

When analyzing the impact of different information quality across GAAP regimes on a firm's cost of capital, a switch from local financial reporting to IAS/IFRS and/or US-GAAP can be seen as an even stronger signal of increasing information quality rather than voluntary disclosure or certain earnings attributes within one accounting regime which is reversible by managerial discretion in the future. An international reporting strategy, instead, represents a credible commitment to increased public investor orientation. That is because although, for example, IFRS adoption is voluntary in the EU before 2005, the higher disclosure rules under IFRS are mandatory once a firm has committed itself and IFRS implementation is difficult to reverse given the material costs of transition (see Leuz/Verrecchia 2000). The perceived more informative earnings attributes under IFRS and/or US-GAAP come on top of the disclosure explanation. Further, the theoretical setting of reducing private information in the market by more public disclosures is particularly appealing to the Continental European case. Here, given historically

concentrated ownership structures and reliance on private debt financing, the financial accounting standards have evolved to be rather uninformative for outside investors, but instead have reasonably well informed key financing and contracting parties by communicating private information (see Leuz/Wüstemann 2003). The switch to Anglo-American standards customized towards the needs of outside investors which Continental European firms increasingly try to attract under globalization pressures can thus be considered a key example for exchanging private for public information.

Despite this theoretical background and the popular claim that IAS/IFRS or US-GAAP adoption reduces a firm's cost of capital, there is surprisingly little supporting empirical evidence. Prior evidence is rather small sample based and none has applied the same research methodology as the within GAAP studies (See Joos 2000, p. 133). When looking at the market effects of the announcement to adopt IFRS or US-GAAP, Pellens/Tomaszewski (1999) document insignificant average stock price reactions to the announcement of the first eight IAS and six US-GAAP adopters in Germany. Similarly, Comprix/Muller/Stanford-Harris (2002) find only weakly significant but negative average stock price reactions of EU firms to the announcement of the European Commission to require IFRS in the EU for listed companies from 2005/2007. Further, Auer (1998) examines changes in beta and share price volatility for a sample of seventeen Swiss firms that have switched very early to IAS in the period from 1988 to 1993 and thus well before the completion of the Comparability/Improvement Project. He finds no significant changes in beta factor or share price volatility for these early adopters. Finally, Leuz/Verrecchia (2000) examine for a set of fourteen IAS and seven US-GAAP adopters in Germany bid-ask spread, trading volume and share price volatility as proxies for the information asymmetry component of their cost of capital. They find consistently lower bid-ask spreads and higher share turnover, but no reduction in share price volatility for firms using IAS or US-GAAP as compared to firms reporting under local German GAAP.

2.2. The Process of Transition towards IFRS

Globalization and the integration of capital markets around the world have increased the demand among investors for a universal set of reporting standards in the past decade (see McKinsey 2002).[22] The International Accounting Standards Committee (IASC) founded in 1973 aims at providing such a "single set of high quality, understandable and enforceable global accounting standards".[23] After being criticized for its early standards, the IASC considerably decreased the number of accounting alternatives in its Comparability/Improvements Project from 1987 to 1995 and further shaped its standards afterwards in the process of seeking endorsement of the International Organization of Securities Commissions (IOSCO). After successful completion, IOSCO has recommended its members from 2000 to permit firms preparing their financial statements according to IASC core standards for cross-border offerings and listings.[24] Today, major stock exchanges around the world accept IFRS (e.g. London, Tokyo or Frankfurt) – the U.S. exchanges being the most important exception.

The rising acceptance of IFRS globally has particularly been boosted by the EU. After failure of its mutual recognition strategy with the U.S. and unsuccessful attempts to improve its own reporting requirements set forth in the 4th and 7th Directives, the European Commission implemented in 1995 a new strategy supporting IASC standards.[25] This policy finally lead in July 2002 to Regulation (EC) No 1606/2002 requiring from all EU publicly traded companies to adopt IFRS by 2005 (with some exceptions by 2007) and in September 2003 to Regulation (EC) No 1725/2003 endorsing all standards (IASs) and interpretations (SICs) in EU law except IAS 32 and IAS 39 and related interpretations.[26] In consequence, this policy implies that around 7,000 listed EU companies[27] will have to report their results

[22] In their "Global Investor Opinion on Corporate Governance" survey in 2002, 90% of the interviewed 200 institutional investors favored a single set of global accounting standards.
[23] See IASC Foundation Constitution (2002), PART A, No. 2.
24 See IOSCO Press Release "IASC Standards" on May 17, 2000.
25 See EU COM (95) 508 (1995).
26 See http://europa.eu.int/comm/internal_market/accounting/ias_en.htm and Wagenhofer (2003), pp. 26-34.
27 See Federation of European Securities Exchanges; http://www.fese.be/statistics/monthly_statistics/tables/table4.htm.

under IFRS from 2005/2007. It has also inspired other standard setters to consider IFRS alike.[28]

In some EU member countries,[29] the process towards adoption of internationally recognized standards started well before the EU Regulations and was initiated by multinational corporations trying to attract foreign capital.[30] In 1993, Daimler-Benz reconciled in Form-20F to US-GAAP after seeking listing on NYSE[31] and Puma presented a full second set of financial statements under IAS. After Daimler-Benz had "broken the ice" (Wagenhofer 2003, p. 2), more and more companies started to adopt voluntarily either IAS or US-GAAP in the following years under different strategies which satisfied the still existing requirement to prepare consolidated financial statements in accordance with German GAAP.[32]

In April 1998, the German legislator finally reacted with the *KapAEG* law to these "revolutionary"[33] and "unexpectedly rapid"[34] developments and introduced § 292a HGB allowing listed German parent companies to prepare their consolidated financial statement solely under unspecified international accepted accounting standards[35] for a transitional period expiring by December 31, 2004.[36] The introduction of § 292a HGB resulted in a sharp increase in the number of companies adopting IAS or US-GAAP. By 1999, the number of firms reporting according to international standards already rose above 50 percent in the group of the 100 DAX-firms.[37]

In addition, the German Stock exchange *Deutsche Börse* launched in March 1997 the New Market, a stock market segment particularly for innovative and fast-growing industries. Given the large uncertainty about a firm's business prospects, the listing regulations explicitly required financial statements to be prepared

[28] See IASB (2002c): "Other justisdictions move towards IFRSs". These are, e.g., Australia, Canada, Russia.
[29] See Leuz/Wüstemann (2003) for a summarizing survey on the role of accounting in the German financial system.
[30] See Gebhardt (2000) and Busse von Colbe (2002) for summaries of this process.
[31] See Radebaugh/Gebhardt/Gray (1995) for an in-depth discussion.
[32] See Leuz/Verrecchia (2000) for a summary of the early adoption practices which included: (1) reconciliations to income and shareholders' equity under IAS or US-GAAP (2) dual reporting under which firms produced one set of financial statements as close as possible to IAS or US-GAAP without violating HGB (3) parallel reporting under which companies disclosed two full sets of financial statements, one under local GAAP and another under IAS or US-GAAP.
[33] See Busse von Colbe (1995).
[34] See Kleekämper (1995).
[35] Such standards are IAS/IFRS and US-GAAP, see DRS 1.10-13.
[36] Kapitalaufnahmeerleichterungsgesetz – KapAEG, BGBI, April 24, 1998.
[37] See Spanheimer (2002), p. 216.

according to IAS or US-GAAP.[38] After an enormous early success, however, firms listed on the New Market were reassigned in 2003 to two new market segments, the Prime Standard and the General Standard. The requirement to prepare internationally accepted standards now applies only to the Prime Standard.[39]

[Insert Table 1 about here]

Table 1 summarizes these developments towards internationalization of financial reporting in Germany. The yearly number and percentages of firms reporting under HGB, IAS/IFRS and US-GAAP are presented for my sample which very well reflects the entire population. The German setting represents the ideal field for an experiment testing the common conjectures and theoretical predictions that adopting International reporting (IAS/IFRS and/or US-GAAP) lowers a firm's cost of capital as not only the number of available firms applying IAS/IFRS are higher than in any other country worldwide as of today,[40] but also as the effect of reducing asymmetric information and thus on a firm's cost of capital should be particularly high here given Germany's local accounting regimes' reputation of being among the most discrete in the EU, if not worldwide.

3. Empirical Analysis

3.1. Estimating the Expected Cost of Equity Capital

While the literature in accounting, finance and economics has suggested a wide range of estimation procedures for the measurement of a firm's cost of equity capital, traditional state of the art methods, such as the CAPM or the Fama/French Three-Factor-Model not only have produced disappointing results empirically (Fama/French 1997; 2003), they also are questionable in that they use average

[38] See Leuz (2003), pp. 450-452 for a detailed description of the New Market in Germany.
[39] See *Exchange Rules for the Frankfurt Stock Exchange* § 62 (1).
[40] In 2003, the majority of IFRS adopters globally (56%) are based in the three German accounting origin countries Austria, Germany and Switzerland. The remaining 44% IFRS adopters are spread over 37 other countries around the world according to the list provided by the IASB, on: www.iasc.or.uk/cmt, September 26, 2003.

realized returns instead of measures of expected returns for which the underlying theories on asset pricing call for (Elton 1999).

An alternative approach has been proposed that does not rely on realized returns and instead applies forward-looking data (see Botosan 1997, GLS 2001). The underlying idea is to use a model of corporate valuation to generate a market implied cost of equity capital, defined as the internal rate of return that equates the current stock price to the present value of the market's expected future residual flows to common shareholders as approximated by observable consensus analyst forecasts. In equilibrium, the same information is reflected in the stock price on the left side and in the consensus forecasts on the right side of the equation. Accordingly this internal rate of return reflects the cost of equity that the market applies to expected future cash flows (Mehra 2002). This approach is not only conceptually appealing and has been used by other current studies in this field,[41] it also bypasses further issues in the traditional methods in my context. Specifically, the CAPM provides no role for accounting standards on the one hand,[42] but book-to-market as one important risk factor in the Fama/French Three-Factor-Model is certainly influenced by the accounting standards applied, however without priors of the effect on the factors' risk premia, on the other.

3.1.1. Model Selection

Based on the same theoretical foundation, all models of corporate valuation lead to identical results under consistent assumptions. However, for practical reasons earnings based valuation appears to be the most reasonable to implement when estimating an implied cost of capital. In several studies evaluating the models' ability to explain cross-sectional stock prices, the residual income model (RIV) has shown to have higher accuracy empirically than cash flow-oriented methods (DDM, DCF). [43] Further, earnings forecasts by analysts are available in I/B/E/S for international data since 1987, whereas cash flow and dividend forecasts have become available only very recently.[44]

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[41] See, for example, Richardson/Welker (2001), Botosan/Plumlee (2002), Hail/Leuz (2003).
[42] See Botosan (1997), Easley/O'Hara (2004).
[43] See Penman/Sougiannis (1998), Frankel/Lee (1998), Francis/Olsson/Oswald (2000).
[44] See Thomson Financial (2003).

Two concepts for earnings based estimations have been suggested in the related literature, residual income valuation (RIV) and capitalized expected earnings after Ohlson/Juettner-Nauroth (2000) (OJN). Both have their unique advantages and disadvantages: Whereas in RIV the central assumption of clean-surplus accounting can be violated on a per share basis (Ohlson 2000), such violations have no effect on the OJN valuation (Ohlson/Juettner-Nauroth 2000). RIV can cope with any earnings forecast, whereas cost of capital estimations building on OJN are restricted to subgroups of firms with positive earnings forecasts only (see Easton 2004). Since research on the relative ability of the two approaches to explain cross-sectional variation in future stock returns has only started (see Guay/Kothari/Shu 2003, Easton/Monahan 2003), I utilize both concepts in line with Hail/Leuz (2003). Given that the valuation models' estimates have shown to be particularly sensitive to the choice of the long-term future growth rate in terminal value calculation, I further utilize two estimation approaches for each model: The first uses economically plausible assumptions about future growth and can be applied to a single firm (GLS 2001; Gode/Mohanram 2002), while the second simultaneously estimates the expected cost of equity capital and the long-term growth rate in a portfolio, but can only be applied to a set of firms (ETSS 2002, Easton 2004). In addition, I adjust the RIV methods for monthly estimation (Daske/Gebhardt/Klein 2004) as described in the next section.

3.1.2. Estimation Procedures

Most previous studies calculate the expected rate of return only once a year at a specific predetermined date (e.g. June 30/December 31/ten month after a firm's fiscal year's end) [45]. I estimate the expected cost of equity capital monthly as I/B/E/S updates its consensus forecasts once each month (at the third Thursday).[46] Further, I require that all information necessary to calculate the expected cost of equity capital is available to market participants at the time[47] and that the input

[45] See GLS (2001), p. 145; Gode/Mohanram (2002), p. 15 (in June), ETSS (2002), p. 664; Easton (2004), pp. 19-20 (in December), Hail/Leuz (2003), p. 5 (ten month after a firm's fiscal year's end).
[46] Similarly, Lee/Myers (1999) also estimate the intrinsic value of a firm monthly using a RIV model.
[47] ETSS (2002) perform their estimation for December 31 and use book value of equity, although this number becomes available (even to insiders) only later in the next fiscal year.

variables applied consistently reflect the level of information at that estimation date.[48]

3.1.2.1. Assuming Long-Term Growth

The expected cost of equity capital can be estimated for each individual firm at every monthly estimation date in case a long-term growth rate is assumed.

Residual Income Valuation (RIV)

My RIV estimation method assuming long-term growth is a modification of the approach by GLS (2001) in which the infinite forecast horizon is divided into three stages: (a) the explicit forecast period, (b) the fading period, and (c) the terminal value:

$$
\begin{aligned}
p_t = E(bvps_t) &+ \frac{feps'_t - \left[\left(1+r^{RIV}\right)^{\frac{days(estimation\ date,\ year(1))}{365}} - 1\right] \times bvps_t}{\left(1+r^{RIV}\right)^{\frac{days(estimation\ date,\ year(1))}{365}}} \\
&+ \sum_{n=2}^{5} \frac{feps_{t+n} - r^{RIV} \times bvps_{t+n-1}}{\left(1+r^{RIV}\right)^{\frac{days(estimation\ date,\ year(n))}{365}}} \\
&+ \sum_{n=6}^{11} \frac{\left(FROE_{t+n} - r^{RIV}\right) \times bvps_{t+n-1}}{\left(1+r^{RIV}\right)^{\frac{days(estimation\ date,\ year(n))}{365}}} \\
&+ \frac{E(RI_{12})}{r_{RIV}\left(1+r^{RIV}\right)^{\frac{days(estimation\ date,\ year(11))}{365}}}
\end{aligned}
\qquad (1)
$$

(a) Explicit forecast period

(b) Fading period

(c) Terminal value

[48] Variables used in a RIV framework in former studies often reflect information at different points in time. For example, Claus/Thomas (2001) use share prices and book values of equity as of December 31st, but forecasts as of April 30th of the following year. This implies that information flows into the estimation as of December 31st which will be available only at the end of April.

where:	E(.)	=	Expectation based on information available at time t
	p_t	=	Price per share at time t
	$bvps_t$	=	Book value per share at time t
	$feps'_t$	=	Forecasted earnings per share for the time between the estimation date t and the next fiscal year's end
	$feps_t$	=	Forecasted earnings per share at time t
	$FROE_t$	=	Forecasted return on equity at time t
	RI_t	=	Residual income per share at time t
	$days$	=	Number of days between estimation date and fiscal year's end
n			
	r^{RIV}	=	Cost of equity capital under RIV.

(a) The *explicit forecast period* covers the next five financial years of detailed analyst consensus earnings forecasts, the maximum future period for which historical data is potentially available in I/B/E/S. The "consensus" earnings estimates are calculated as median EPS-forecast of all individual analysts. I require consensus earnings forecast at least for the next three financial years following the estimation date. In case there are less than five future years of forecast data, but (instead) a consensus estimate of the long-term growth rate of earnings applying to the period from the last detailed EPS-forecast until year five, I estimate the missing forecasts for years plus four and/or plus five as $feps_{t+1} = feps_t\left(1 + g^{IBES}\right)$. If the consensus growth rate is not available, I approximate these forecasts by applying an artificial growth rate of earnings implicit in the available previous period forecasts calculated as the mean absolute change in earnings:

(2)
$$feps_4 = feps_3 + \frac{\left(feps_3 - feps_1\right)}{2}$$

$$feps_5 = feps_4 + \frac{\left(feps_4 - feps_1\right)}{3}$$

where:	$feps_t$	=	Forecasted earnings per share at time t

Under the assumptions that clean-surplus accounting holds in expectations, earnings forecasts, the assumption of a constant dividend payout-ratio and current book value of equity allow to calculate expected future book values of equity and finally the expected residual income for the next five future periods starting from the estimation date:

(3) $$E_t(RI_n) = feps_n - r^{RIV} \times E_t(bvps_{n-1})$$

$E_t[RI_n]$	=	Expected residual income per share for period n at time t
$E_t[bvps_n]$	=	Expected book value per share in period n
$Feps_n$	=	Forecasted earnings per share for period n at time t
r^{RIV}	=	Cost of equity capital under RIV.

(b) During the *fading period*, forecasted earnings are calculated by multiplying the return on equity (ROE), defined as the ratio of earnings at this fiscal year's end and the book value of equity of last fiscal year's end. Starting from the ROE at the end of explicit forecast period 5, the ROE is then assumed to fade straight-line in the following years to the expected target-ROE of the industry in period 12. Accordingly, expected earnings are calculated for fiscal years 6 to 12 as:

(4) $$feps_n = FROE_n \times bvps_{n-1}$$

where:

$feps_n$	=	Forecasted earnings per share at the end of period n
$FROE_n$	=	Forecasted book return on equity at the end of period n
$bvps_{n-1}$	=	Book value per share at the end of period n-1

This method implies that no individual firm is able to earn abnormal profits beyond a certain period of time due to the dynamics of market competition and will be tending towards their industry peers. Absent a data-base which collects analyst expectations beyond period 5, I determine the target-ROE of the various industries as in GLS (2001).[49]

(c) The *terminal value* for year 12 is finally estimated by computing the present value of residual income in period 12, which is assumed to be earned as constant rent in perpetuity.[50]

In order to match the input variables reflecting only information available to the market at the estimation date, I adjust the accounting data referring to the fiscal

[49] All firms are grouped into the various industry peers as in Fama/French (1997) and then the median ROE's over the past 5 years are calculated for each group as proxy for expected ROE. Certainly, industry ROE's are affected by the (changing) accounting rules of the firms analyzed in the industry. It is a priori difficult to judge how they are affected and how a potential bias could be corrected. See Easton/Taylor/Shroff (2001) for general deficiencies of the target ROE.

[50] This implies that any growth in earnings after year 12 is value neutral, see GLS (2001), p. 142. Alternatively, other studies assume a moderate growth rate of residual income, see Claus/Thomas (2001), p. 1636.

year's end dates (book value of equity, earnings forecasts) as in Daske/Gebhardt/Klein (2004). I compute a book value of equity under the assumption that book value of equity is growing steadily over the fiscal year at each monthly estimation date A ($bvps_A$) at which I/B/E/S consensus forecasts are renewed. Using this assumption, I calculate the $bvps_A$ as:

$$bvps_A = bvps_0 \times (1 + FROE_1)^{\frac{days(estimation\,date, year(1))}{365}} \quad (5)$$

where:

A	=	Estimation date
$bvps_A$	=	Book value per share at the estimation date A
$bvps_0$	=	Book value per share at the previous fiscal year's end date 0
$FROE_1$	=	Forecasted book return on equity for the next fiscal year

Into this calculation flows the expected ROE for the financial year which is used to calculate the interest compound up to that estimation date A. The expected ROE applied is calculated by using the most recent explicit analyst consensus earnings forecast referring to that next fiscal year's end:

$$FROE_1 = \frac{feps_1}{bvps_0} \quad (6)$$

where:

$FROE_1$	=	Forecasted book return on equity for the following fiscal year
$feps_1$	=	Forecasted earnings per share for the next fiscal year
$bvps_0$	=	Book value per share at the previous fiscal year's end date 0

Adding compound interest to last fiscal year's book value of equity ($bvps_0$) is a proxy for earnings realized from last fiscal year's end up to the estimation date A. This means that the expected earnings from estimation date A to next fiscal year's end have to be calculated by using the definition of earnings as a change in shareholders equity which then forms the basis for calculating the first residual income number in the explicit forecast period $E_t[RI_1]$:

(7)

$$E_A[RI_1] = feps_1 - [bvps_A - bvps_0] - \left[\left(1 + r^{RIV}\right)^{\frac{days(estimation\,date,\,year(1))}{365}} - 1 \right] \times bvps_A$$

where:

	A	=	Estimation date
	$E_t[RI_n]$	=	Expected residual income per share for period n at time t
	$feps_1$	=	Forecasted earnings per share for the next (unpublished) fiscal year's end
	$bvps_A$	=	Book value per share at the estimation date A
	$bvps_0$	=	Book value per share at the previous fiscal year's end date 0
	$days$	=	Number of days between estimation date and fiscal year's end n
	r^{RIV}	=	Cost of equity capital under RIV.

The projected residual income of the following periods (2, 3, 4, 5) is always referring to a full fiscal year and are discounted to the estimation date under the daily conventions (formula 1).

In case the earnings estimator for the first future period (FY1) in I/B/E/S doesn't refer to a future, but to a past fiscal year's end date (which can occur when the fiscal year's end date has already passed, but the annual report has not yet been published), the starting input $bvps_0$ is not available yet and has to be calculated via the clean surplus relation using the previous year's book value of equity $bvps_{-1}$, the payout-ratio and the earnings forecast for FY1. Since this results in a loss of one earnings estimator, the maximum number of explicit forecasts in the detailed planning period is reduced to 4 years in which case, I extend the fading period by one additional year.

Capitalized Expected Earnings (OJN)

My OJN estimation method assuming long-term growth follows Gode/Mohanram (2002) who empirically implement the Ohlson/Juettner-Nauroth (2000) model. It builds on the Gordon Growth model and relates under a set of restrictive assumption current stock price to expected next year's earnings ($fesp_1$), dividends ($fdps_1$), two-year ahead earnings ($feps_2$), and growth of earnings (g), subdivided into short- (g_{st}) and long-term (g_{lt}). This yields the pricing equation (8), which transforms into equation (9) for estimating the expected cost of equity capital[51]

[51] For further details, see Ohlson/Juettner-Nauroth (2000) and Gode/Mohanram (2002), pp. 6-8.

$$(8) \qquad p_t = \frac{feps_{t+1}}{r^{OJN}} + \frac{\left[feps_{t+2} + r^{OJN} \cdot fdps_{t+1} - (1 + r^{OJN})\, feps_{t+1})\right]}{r^{OJN}\left(r^{OJN} - g_{lt}\right)}$$

$$(9) \qquad r_{t,OJN} = A + \sqrt{A^2 + \frac{fepst_{t+1}}{P_0} * (g_{st} - g_{lt})}$$

$$and \quad A = \frac{1}{2} * \left(g_{lt} + \frac{fdps_{t+1}}{P_0} \right)$$

where:

p_t	=	Price per share at time t
$feps_t$	=	Forecasted earnings per share at time t
$fdps_t$	=	Forecasted dividends per share at time t
g_{st}	=	Short-term growth rate of earnings under OJN
g_{lt}	=	Long-term growth rate of earnings under OJN
r^{OJN}	=	Cost of equity capital under OJN at time t.

I determine future growth rate inputs as in Gode/Mohanram (2002): The short-term growth rate g_{st} is estimated as the average of forecasted second year earnings growth and the five-year earnings growth forecasts as provided by I/B/E/S. As proxy for the long-term growth in earnings serves the risk free rate r_f (10 year REX-return) minus 3%.

As one can infer from equation (9), OJN estimation requires only current stock price and forecasts; no current accounting data (book value) as starting point is needed as in RIV. Therefore, no timing issues concerning the (lagged) publication of annual reports arise and monthly estimation can easily be implemented.[52] However, these benefits along with requiring only forecasts for the next two periods came at the cost of being applicable only in cases of a forecasted positive change in earnings.

[52] In the spirit of the simplicity of this valuation model, I do not further incorporate as in the more sophisticated RIV procedures the timing aspect of how far the estimation date (0) is away from the next (1) or following (2) fiscal year's ends. Former research has estimated the expected cost of capital using OJN at the various month over the financial year (Easton 2003, in May; Gode/Mohanram 2002, in June; Easton 2004, in December; Hail/Leuz 2003, any month 10 month after fiscal year's end).

3.1.2.2. Estimating Expected Cost of Equity Capital and Long-Term Growth Simultaneously

The growth assumptions under the previous two empirical implementations of RIV and OJN as taken from the original studies are different and hence inconsistent with each other. Further, it is well known that nominal future (residual) earnings growth is determined by the level of conservatism in accounting (Zhang 2000) and by expected inflation (Hail/Leuz 2003). While the inflation rates have been remarkably stable in Germany over the sample period, the issue of conservatism in accounting is particularly relevant here for firms switching from one accounting system to another. Accordingly, I further apply estimation procedures which jointly estimate in a regression framework this long-term growth rate of (residual) earnings together with the expected cost of equity capital. This method cannot be applied at the individual firm, however, but only at the portfolio level. In order to control for other omitted risk characteristics, I focus on the switch firms only. I further run the estimation not monthly, but at particular dates since simultaneous estimation has only been performed on portfolios in which each firm-observation enters only once,[53] and independence of observations included in the sample is a requirement when using data-based simulation to formally test for the difference in expected values.[54]

Residual Income Valuation (RIV) and Simultaneous Estimation

The first simultaneous estimation procedure based on RIV is a modification of ETSS (2002). They apply a single-stage perpetuity method using the Gordon growth formula in which the present value of the firm's future residual income adding to its book value of equity is computed as residual income of the next period divided by the cost of equity capital minus the growth rate of residual income. Since this specification would disregard the information available about the forecasted analyst consensus estimates of the following periods, however, projected earnings are cumulated as aggregate earnings over the period of four future years as in Easton/Harris/Ohlson (1992) and in formula (10), a future period is thus not one

[53] See ETSS (2002), pp. 663-666 and Easton (2004), pp. 83-85.
[54] The lack of independence of monthly earnings forecasts and stock prices could reduce the accuracy of inferences as independence between observations is an important assumption present in bootstrapping based inference. A more advanced approach would be to use moving blocks bootstrap. See Efron/Tibshirani 1993, pp. 99-102.

year, but a four-year period. The fundamental value of a firm using an aggregate earnings approach including is then estimated as:

$$(10) \qquad p_t = bvps_t + \frac{X_{cT} - \left[\left(1 + r^{RIV}\right)^4 - 1\right] \times bvps_t}{\left(1 + r^{RIV}\right)^4 - \left(1 + g^{RI}\right)^4}$$

where:

p_t	=	Price per share at time t
$bvps_t$	=	Book value per share at time t
X_{cT}	=	Aggregate earnings over 4 years including interest on reinvested dividends
g^{RI}	=	Infinite growth rate of residual income under ETSS (2002)
r^{RIV}	=	Cost of equity capital under RIV

Given the two unknown variables to be estimated (r^{RIV} and g^{RI}) in equation (10), it can only be solved by adding similar firms to a portfolio and by running the following regression obtained after rearrangements on this portfolio:

$$(11) \qquad \frac{X_{cT\,j,t}}{bvps_{j,t}} = \alpha + \beta \times \left(\frac{p_{j,t}}{bvps_{j,t}}\right) + \varepsilon_{j,t}$$

and $$\alpha = \left(1 + g^{RI}\right)^4 - 1$$

and $$\beta = \left(1 + r^{RIV}\right)^4 - \left(1 + g^{RI}\right)^4$$

where:

$x_{cT\,j,t}$	=	Aggregate four-years earnings of firm j at time t
$bvps_{j,t}$	=	Book value per share of firm j at time t
$p_{j,t}$	=	Price per share of firm j at time t
$\varepsilon_{j,t}$	=	Error term of the linear regression
α	=	Regression intercept
β	=	Regression slope coefficient
g^{RI}	=	Infinite growth rate of residual income under ETSS (2002)
r^{RIV}	=	Cost of equity capital under RIV

The regression coefficients α and β represent the average expected cost of equity capital and the average infinite growth rate of residual income for the firms included in the portfolio and determine a combination of r^{RIV} and g^{RI}:

$$(12) \qquad g^{RI} = \sqrt[4]{(1+\alpha)} - 1$$

$$r^{RIV} = \sqrt[4]{\left(\beta + \left(1 + g^{RI}\right)^4\right)} - 1$$

When solving for the regression-function, a circularity problem exists as the solution to be found (r^{RIV}) is also needed as input parameter into the regression through aggregate earnings X_{cT}. This issue is resolved by an iterative process starting from an initial arbitrary value of r^{RIV}= 12% to be repeated until the difference between starting value and solution converges to zero.

I further implement monthly estimation in the original approach of ETSS (2002) which allows the inclusion of firms with different fiscal year's ends in the portfolio.[55] As in RIV assuming long-term growth, I calculate a starting book value of equity for each firm at the estimation date by adding compound interest to the last fiscal year's shareholder equity and reduce the expected earnings for FY1 by the same amount. Since I keep the length of earnings aggregation over a four year window constant (from starting, monthly estimation date A to ending date P), I also have to perform a similar adjustment at the ending date P for the calculation of total aggregate earnings, again assuming the dividends are paid out at the fiscal year's end dates. For example, in the case the first earnings estimator refers to a future fiscal year's end, the projected last earnings forecast used is calculated as:

$$feps'_p = bvps_4 \times [(1 + FROE_5)^{\frac{days(year(4),\, end\ date\ of\ period\ P)}{365}} - 1] \tag{13}$$

where:
$E_t[RI_n]$ = Expected residual income per share for period n at time t
P = Date at which the four year window ends, starting from estimation date A
$feps'_P$ = Forecasted earnings per share for the time between the fiscal year's end date four and the end date P
$bvps_4$ = Book value per share at the fiscal year's end date four
$days$ = Number of days between fiscal year's end date four and the end date P
$feps_t$ = Forecasted earnings per share at time t
$FROE_5$ = Forecasted book return on equity for the fiscal year 5

I use the four year window as in the original ETSS (2002) study in order to include the maximum number of detailed analyst consensus forecasts available. In case not all necessary future earnings estimates are available, I approximate these forecasts by applying an artificial growth rate of earnings implicit in the available (at least three years) previous period earnings as in equation (2).

[55] The original study includes only December fiscal year's end firms. See ETSS (2002), pp. 664. For a detailed discussion of the adjusted estimation procedure, see Daske/Gebhardt/Klein (2004), pp. 15-18.

Capitalized Expected Earnings (OJN) and Simultaneous Estimation

The second simultaneous estimation method based on OJN is taken from Easton (2004). He estimates the perpetual long-term earnings growth rate together with the implied cost of equity capital in a portfolio of stocks instead of assuming it as in Gode/Mohanram (2002). Under his definition, total growth is divided into short-term expected growth in cum-dividend accounting earnings from period one to two (agr_1) and long-term change in abnormal growth in earnings (Δagr). The OJN inspired pricing equation (8) forms then into (14):

(14)

$$P_t = \frac{feps_{t+1}}{r^{OJN}} + \frac{\left[feps_{t+2} + r^{OJN} \cdot fdps_{t+1} - (1 + r^{OJN})\, feps_{t+1})\right]}{r^{OJN}\left(r^{OJN} - g_{lt}\right)} = \frac{feps_1}{r^{OJN}} + \frac{agr_{t+1}}{r^{OJN}\left(r^{OJN} - \Delta agr\right)}$$

where: p_t = Price per share at time t
$feps_t$ = Forecasted earnings per share at time t
$fdps_t$ = Forecasted dividends per share at time t
g_{lt} = Long-term growth rate of earnings under OJN
Δagr = Long-term change in abnormal growth in earnings under Easton (2004)
r^{OJN} = Cost of equity capital under OJN

Similar to the idea in ETSS (2002), a linear regression (14) is run on a portfolio of stocks obtained after rearrangements of equation (13), the circularity problem again being resolved by an iterative process starting from an initial arbitrary value of r^{OJN}= 12%.

(15) $$\frac{feps_{j,t+2} + r^{OJN} fdps_{j,t+1}}{P_{j,0}} = \frac{fceps_{j,t+2}}{P_{j,0}} = \alpha + \beta \times \frac{feps_{j,t+1}}{P_{j,0}} + \varepsilon_{j,0}$$

and $$\alpha = r^{OJN}\left(r^{OJN} - \Delta agr\right)$$

and $$\beta = \left(1 + \Delta agr\right)$$

where:

$feps_{j,t}$	=	Forecasted next-periods earnings per share for firm j at time t
$fdps_{j,t}$	=	Forecasted next-periods dividends per share for firm j at time t
$P_{j,0}$	=	Price per share of firm j at time 0
$fceps_{j,2}$	=	Forecasted two-period ahead cum-dividend earnings per share for firm j
Δagr	=	Long-term change in abnormal growth in earnings under Easton (2004)
r^{OJN}	=	Cost of equity capital under OJN
$\varepsilon_{j,t}$	=	Error term of the linear regression
α	=	Regression intercept
β	=	Regression slope coefficient

The regression coefficients α and β the represent the average expected cost of equity capital r^{OJN} and the average long-run change in abnormal growth in earnings Δagr for the portfolio-firms:

$$\Delta agr = \beta_1 - 1$$

(16)

$$r^{OJN} = \frac{\Delta agr \pm \sqrt{\Delta agr^2 + 4\alpha}}{2}$$

Data-based simulation and Testing for Differences in Simultaneous Estimations

A bootstrap procedure as data-based simulation method for statistical interference (see Efron/Tibshirani 1993) is put forward to formally test differences in expected cost of capital when estimated simultaneously with long-term growth in a regression framework. Under bootstrapping, from the total number of observations at a specific estimation date, for example prior to the switch (n_{pre}), n_{pre} firm-observations are drawn randomly *with replacement* from the total set n_{pre}. Each simulated subsample then enters into the ETSS (2002) and Easton (2004) regressions which estimate a set of combinations of expected cost of capital (r) and future growth rate (g). Repeating this procedure with B=1000 iterations yields empirical distributions of r and g. The various generated distributions can then be exploited to apply test statistic. For a test of the difference in the expected values of r and g, for example pre and post the adoption of internationally recognized standards, I use Wilcoxon non-parametric test statistics on the generated

distributions as well as simulation-based test statistics for testing the equality of means (see Efron/Tibshirani 1993, p. 224).

3.2. Data

Table 2 lists the input variables for my estimations and their data sources. I use the *IBES Summary History File – Version 2.0* as of January 2003 for analyst consensus earnings forecasts, the number of shares outstanding and stock prices. Data on book value of equity, payout-ratio, industry classification as well as the industry target-ROE come from *Thomson Financial Analytics – Worldscope*. Finally, my proxy for the risk-free rate is the 10 year REX-return collected from *Datastream*.

[Insert table 2 about here]

In order to have broad coverage in I/B/E/S on analyst forecast data, I initially limit my analysis to the period from January 1989 to December 2002. The starting number of all available 69,785 earnings forecast observations on German listed firms for that period in I/B/E/S was reduced by:

(1) Financial data missing after merging databases on shares outstanding, share price, accounting data and target-ROE resulted in a loss of 17.37% of total observations.

(2) The market's consensus earnings forecasts are a key determinant of the estimation procedure. In order to ensure that my inputs really measure market expectations over the relevant forecast horizon, I require from each observation either at least consensus EPS-forecasts for the next three periods (out of a theoretically maximum of five periods available in I/B/E/S) or consensus EPS forecasts for the next two periods and a long-term growth rate (applying to periods three to five). This represents in my view the best trade-off between extracting market expectations on the one hand and a representative sample size including smaller firms on the other. I loose another 35.77% of the initial observations for which I have only FY1 or FY1 and FY2 forecasts.

(3) I try to minimize data errors by deleting forecast data of questionable quality. This included (a) stacked forecasts (4.72%) and (b) insolvency forecasts (0.74%).

   (a) Stacked forecasts: According to § 325 (1) HGB, annual reports should be available within nine month after the end of the fiscal year. I delete all forecasts which refer to a fiscal year's end longer than nine months ago and most probably have not been updated in-time by the database.

   (b) Insolvency forecasts: In some special cases analysts estimate losses which would result in a negative book value of equity in a future period and thus would lead to the firm's insolvency if no additional equity capital will be provided. I delete such observations as not representative.

(4) I finally restrict my analysis to the period from fiscal year 1993 onwards – the period in time in which the first German firms began to report their results according to International standards (Daimler-Benz, reconciliation to US-GAAP; Puma, parallel report in IAS).

[Insert table 3 about here]

Table 3 summarizes my sample selection procedure. The final sample consists of 24,359 observations across all estimation months and is based on a set of 735 German companies for which I identify their financial reporting standards applied for each fiscal year's end as described in the auditors statement of a firm's annual report (on *Thomson Research*). In total, 155 firms only reported under IAS/IFRS and 127 only under US-GAAP; 52 switched from German GAAP (HGB) to IAS/IFRS and 24 to US-GAAP. The remaining 377 companies reported their results under HGB.

I code each firm-month observation according to the financial reporting standards applied in the last available annual report on which analysts base their forecasts on. For example, before Puma had published their first International report in Mai 1994 for the fiscal year ending 31/12/1993, Puma monthly observations were coded

"HGB", after that date from June 1994, the following data-points were coded "IAS/IFRS". The total number of 24,359 estimates in the "All" sample split into 16,250 HGB, 4,567 IAS/IFRS and 3,542 US-GAAP observations; the subgroup of 76 firms which switched their accounting standards labeled "Switch" sample consists of 6,459 total observations, of which are 4,064 HGB, 1,564 IAS/IFRS and 831 US-GAAP. Since I estimate the expected cost of equity capital monthly, my total sample is comparable in size to previous US-studies on estimating the implied cost of capital.[56] It is substantially larger the samples of former studies on the economic consequences of applying international standards,[57] also because I include the period until 2002.

3.2. Empirical Results

3.2.1 Descriptive Statistics of the Cost of Equity Capital Estimates

Table 4, Panel A presents descriptive statistics for my expected cost of equity capital estimates using RIV estimation (r_{RIV}) or OJN estimation (r_{OJN}) for the "All" and "Switch" sample. The average expected cost of equity capital of German firms is 11.44% (11.72%) under RIV (OJN) in the period from 1993 to 2002. These cost of equity capital estimates are reasonably close to each other, but typically on average higher under OJN than under RIV. They are comparable in magnitude to estimates in other studies applying the same methods.[58] Mean return expectations for the full sample are higher than in the switch sample with estimates of 9.30% (10.69%).

[Insert Table 4 about here]

When segmenting firms according to their reporting standards, international GAAP reporters (IAS/IFRS or US-GAAP) exhibit *higher* expected cost of equity capital on

[56] GLS (2001) use 18,615, Claus/Thomas (2001) use 33,389 and ETSS (2002) use 26,561 total observations.
[57] Leuz/Verrecchia (2000) use 90, Leuz (2003) uses 341 and Cuijpers/Buijink (2003) use 80 observations.
[58] See, for example, Guay/Kothari/Shu (2003), p. 34, Gode/Mohanram (2002), pp. 29-31, Hail/Leuz (2003), pp. 26-27.

average than local GAAP reporters (HGB). For the full sample ("All"), mean cost of equity capital are 9.85% (11.10%) for HGB, but 14.34% (13.21%) for IAS/IFRS and even higher with 14.99% (13.13%) for US-GAAP firms. The differences between local GAAP and IAS/IFRS as well as US-GAAP are highly statistically significant. Such findings appear to be attributable to the differing sample compositions of the three subgroups: Whereas the HGB set of firms comprise mostly traditional, "old economy" firms, the majority of the international GAAP groups include generally more risky young, "new economy" firms from Germany's former "New Market". When looking only at the switch sample with mostly traditional firms ("Switch"), the difference between HGB (8.56%, 10.34%) and IAS/IFRS (10.27%, 10.97%) or US-GAAP (11.06%, 11.79%) declines, but still exists.

Further, during my sample period, a clear trend of rising expected cost of equity capital and risk premia emerges which is important to consider when comparing firms which switched their reporting standards. Table 4, Panel B, displays for 1993 mean expected cost of equity capital of 7.75% (9.22%) and risk premia of 1.48% (2.98%). Average required returns are steadily increasing up to 17.12% (15.28%) for the cost of equity capital and 12.58% (10.76%) for the risk premium in 2002. This trend is highly statistically significant, remarkable in magnitude and independent of the estimation method applied. It further contradicts reasoning that the increased globalization will cause the equity premia to decline in financial markets globally (Stulz 1999).

3.2.2. Estimation of Expected Cost of Equity Capital Assuming Long-Term Growth

3.2.2.1 Cross-Sectional Analysis

3.2.2.1.1. Risk Factors

In my cross-sectional analysis, I analyze the relationship between implied risk premia and financial reporting dummies (HGB vs. IAS/IFRS or US-GAAP) when controlling for important other factors which have been found to be related to a firm's risk. These are:[59]

Systematic and Unsystematic Risk

The Capital Asset Pricing Models (CAPM) predicts a positive linear association between a firm's measure of systematic risk (beta) and its expected risk premium. As common in the literature, I estimate the beta of each stock based on a five-year rolling regression using monthly returns and the value-weighted Composite DAX (CDAX) index as market proxy.[60] Since prior studies have also documented a positive relationship between a stock's volatility as measure for unsystematic risk and its future returns (Malkiel/Xu 1997), I include volatility independend variable measured as annualized standard deviation from previous year's daily discrete stock returns, assuming 250 trading days in a year.[61]

Financial Leverage

According to financial theory, a firm's cost of equity capital should be an increasing function of the debt-to-equity ratio. Empirically, Fama/French (1992) document a positive relationship between market leverage and realized stock returns. I use the ratio of long-term debt (at book value) to the market value of equity at fiscal year's end.

Information Environment

Information produced by intermediaries such as financial analysts can further lower the information asymmetry between a firm and its investors, and thus lower the risk premium required. I use the number of analysts following as proxy for the general

[59] See also GLS (2001) and Gode/Mohanram (2002).
[60] I require at least 24 data-points (monthly returns) for an estimation. The CDAX includes about 750 listed stocks traded on the official market and proxies the German stock market.
[61] See, for example, Steiner/Bruns (2000), pp. 57-59.

information environment of a firm, hypothesizing that the risk premium is lower for firms with more analysts following.

Stock Market Anomalies

Empirical studies have documented variables which have no explicit foundation in theory, but which have been shown to be statistically associated with realized or expected returns (Elton/Gruber 1995 for an overview). The book-to-market ratio (B/M) and firm size (as log market capitalization of equity) are among the most prominent and are included in the Fama/French Three Factor model (Fama/French 1992). The authors show that high B/M firms earn higher returns ex-post than do low B/M firms. Similarly, firms of large (small) size earn lower (higher) returns. I control for the Fama/French factors as they have also been found to be related to return expectations (see GLS 2001).

Industry Membership

Firms in a specific industry share similar business risks and often similar accounting choices. Estimations of the cost of equity capital using realized returns have often been performed at the industry, rather than at the individual firm level. GLS (2001) find that industry effects explain much of the cross-sectional variation in expected risk premia. I control for industry effects by including the average industry expected risk premium of the previous year in my analysis.

Time

Absent a theoretical background, but given the obvious (increasing) trend of expected risk premia in Table 4, Panel A, I control in my pooled regressions for time by including a monthly count variable, beginning in January 1993 (=1) and ending in December 2002 (=120).

Table 5 presents the descriptive statistics for my control variables after I have winsorized the top and bottom 1% observations. I display descriptive statistics for each variable under the full set as well as divided into the three reporting regimes (HGB, IAS/IFRS and US-GAAP).

[Insert Table 5 about here]

For the full sample ("All") in Panel A, the REX return as proxy for the risk free rate of return used to derive the expected risk premia from the estimated cost of equity capital is on average 5.10%. An analysis of the traditional risk metrics confirms the argument explaining different estimates of cost of capital in table 4 as companies in the international reporting subgroups IAS/IFRS and US-GAAP are more risky than the local GAAP subgroup. Whereas mean beta for all firms is with 0.953 reasonably close to the full market's value of one, the international reporting subgroups show on average much higher values with 1,167 (IAS/IFRS) and 1,443 (US-GAAP) than the local GAAP group with 0,830 (HGB). This is confirmed when looking at the stock's volatility as the international GAAP samples show significantly higher values (0.400; 0.480) than the HGB samples (0.215). The view that the international GAAP reporters belong to more risky industries is further supported when looking at the lagged expected industry risk premia variable. Under these risk metrics, the US-GAAP subsample appears to be altogether the most risky showing even higher average values than the IAS/IFRS set. Table 5, Panel A further illustrates that international reporting firms are on average smaller, less covered by financial analysts and less leveraged than their local GAAP counterparts.

When looking only at the switch firms in table 5, Panel B ("Switch"), the HGB observations are all pre-switch whereas the IAS/IFRS and US-GAAP observations are all post-switch. Here the descriptive statistics for the traditional risk variables are inconclusive: Beta as measure for systematic risk decreases from 0.940 under HGB to 0.921 under US-GAAP and even 0.768 under IAS/IFRS. However, Vola as measure for unsystematic risk increases from 0.184 to 0.230 (IAS/IFRS) and 0.237 (US-GAAP). Interestingly, the median number of analysts following *decreased* after the switch from starting 29 to 26 (IAS/IFRS) and 27 (US-GAAP). This is contrary to the presumption that higher disclosure increases analyst following (e.g. Lang/Lundholm 1996). It reflects either the specific situation after the sharp decline of the global stock markets around 2000 or alternatively that more public available information in the international reports may have decreased the benefits from analyzing German firms' financial statements. The fact that leading representatives of the German Financial Analyst Society (DVFA) have consistently expressed their concerns about the benefits of analyzing internationally recognized financial reports

and have consistently put forward their own tools analyzing local financial reports would be consistent with the later argument.[62]

Table 6 displays correlations between the variables. The parametric (non-parametric) correlation between my two expected cost of equity capital estimates r_{RIV} and r_{OJN} are with 0.692 (0.603) higher than in comparable studies.[63] The signs of the correlations between the cost of equity capital estimates and my control variables are in line with expectations: r_{RIV} and r_{OJN} are negatively correlated with the risk free rate of return and the information environment variables, but positively correlated with all other variables. Generally, these univariate relations are also consistent with prior research in this area such as GLS 2001 and Gode/Mohanram 2002.

[Insert Table 6 about here]

3.2.2.1.2. Multivariate Analysis

I use two methods for my multivariate analysis. In the cross-sectional regressions, I apply pooled linear GLS regressions for which I use clustering of the firm's residuals in order to control for potential autocorrelation in my monthly cost of capital estimates which are relatively stable over time (Table 5, Panel A1 and B1). While this first approach assumes a constant relationship between the factors during my investigation period, the second accounts for intertemporal stability of the relationship between the variables. In these panel regressions, I use 120 (standardized) monthly cross-sectional Fama-McBeth (1973) regressions over the period from January 1993 to December 2002 (Table 5, Panel A2 and B2). The standardization of the variables to a mean of zero and a standard deviation of one allows to measure the relative influence of each explanatory variable on the dependent variable.[64]

[62] See, for example, "Aussagekraft der Bilanzdaten wird angezweifelt; Geiger: US-GAAP und IAS taugen nicht für die Unternehmensbewertung – Kaldemorgen: Schwächen übertüncht", *Börsenzeitung*, July 5, 2003.
[63] These are 0.533 in Hail/Leuz 2003 and 0.501 in Guay/Kothari/Shu 2003.
[64] See Gujarati (2003), p. 174 and similarly GLS (2001), p. 164.

Each panel of table 7 reports results for both cost of equity capital estimators as dependent variables (r_{RIV} and r_{OJN}) as well as for two different sets of independent variables (Models 1 and 2). Panel A applies the full sample ("All") while panel B is restricted to switch firms only ("Switch"). In table 7, panel A1, pooled cross-sectional GLS regressions are run on the full sample. In model (1a), the expected cost of equity capital estimators are regressed on the financial reporting dummies IAS/IFRS and US-GAAP (HGB taking the base value of zero) and on the risk factors of the Fama/French (1992) Three-Factor model as well as on lagged industry risk premium and on a time count variable in order to control for the special sample composition. In model (2a), the variables omitted in model (1a) due to their high correlation with one of the Fama/French (1992) risk factors are exchanged for these factors: The number of analysts following replaces size and the debt-to-market-ratio follows book-to-market. In table 7, panel A2, the same combinations of dependent and independent variables are utilized in Fama/McBeth (1973) regressions.

[Insert Table 7 about here]

The explanatory power of my regressions ranges from high 73.70% of model (1a) under RIV to low 16.08% of model (2b) under OJN and thus varies considerably depending on the regression model and the variables included in the analysis. The explanatory power always shows to be higher when cost of equity capital estimates under RIV rather than under OJN are used as dependent variable, when the independent variables of model (1) rather than of model (2) are employed or when pooled cross-sectional GLS regressions instead of Fama/McBeth (1973) regressions are utilized. As such, these fit statistics for my German sample resemble the results of comparable studies on the U.S. market utilizing the same research methodology.[65]

The signs of the coefficients of my control variables generally turn out to be in the hypothesized direction and are statistically significant in most cases, particularly when regressed on r_{RIV}. In Panel A1, the three risk factors of the Fama/French (1992) model (Beta, Ln_size, BM) show to be highly significant at the 1% level

[65] See GLS (2001), p. 164, Gode/Mohanram (2002), pp. 33-34.

under model (1a). The trend of increasing cost of equity capital over time is confirmed by the high significance of the time variable with its positive coefficient. When under model (2a) the number of analyst following (No.) and the leverage proxy (DM) are included, they also show to be significant at the 1% level. The factor loadings generally decline relative to the pooled results when using Fama/McBeth (1973) regressions in Panel A2, however. Still, size and book-to-market remain highly significant determinants, whereas beta turns only weakly significant at the 10% level in model (1b) and even insignificant in model (2b). Unsystematic risk (Vola) is insignificant in most regressions. Results using the switch firms only in Panel B are qualitatively similar, although less control variable show to be significant, especially under model (2d). The relative influence of the lagged industry risk premium variable is substantial in case of r_{RIV}, and to a lower extend also under r_{OJN}. For example, under the standardized Fama/McBeth (1973) regressions in model (2b), an increase of the industry risk premium by 100 basis points would lead on average to an increase of the firm's expected risk premium of 53 basis points under RIV and of 24 basis points under OJN. This confirms the conclusion of GLS (2001) that "industry membership should be an important characteristic in cost of capital estimation" (p. 138).

The financial reporting standards applied by a firm, however, does not turn out to be an important determinant of the expected risk premium for my German sample firms in the cross-section. This result equally applies to the various model specifications and variables used: In 14 out of total 16 regressions in table 7, the international reporting dummies show to be insignificant, both for IAS/IFRS and for US-GAAP. Only when using model (1a), the US-GAAP dummy only in case of RIV (1.91) and the IAS/IFRS dummy only in case of OJN (2.42) show to be weakly significant, however with positive coefficients contrary to initial expectations. Also, when comparing the magnitude of the standardized coefficients in Panel A2 and B2, the relative influence of IAS/IFRS or US-GAAP on the cost of equity capital estimates is negligible relative to other risk characteristics such as a firm's industry, its size or its book-to-market-ratio. Therefore, I fail to document cross-sectionally a statistically significant effect of the reporting regime on a firm's implied cost of equity capital.

3.2.1.2 Time-Series Analysis around the Switch "Event"

Utilizing the cost of equity capital estimates assuming long-term growth in an "event"-type time-series analysis, I analyze the development of a firm's required risk premium over time around the switch from local to international GAAP.[66] A time frame of maximum six years, three years pre and three years post the switch "event" which marks the first fiscal year in which a firm fully adopted either IAS/IFRS or US-GAAP is examined. I look at not only the *absolute* risk premium, but also control for the general market trend by looking at the *relative* risk premium for which I deduct from each individual firm's risk premium estimate the average of all my sample firms at each estimation month as proxy for the market risk premium. Then the difference in the average monthly expected risk premium over a period of one, two and three years before to after the adoption of IAS/IFRS or US-GAAP for the switch firms is compared and tested. Since not all switch firms have a complete series of monthly observations over the full time window, I calculate for each firm an average of all available monthly estimates pre and post the switch which then enter the analysis and ensure that all firms have an equal weight.[67]

Table 8 presents the results, Panel A for the IAS/IFRS and Panel B for the US-GAAP adopters. The number of firms for which a time series of equal length is available pre and post the switch "event" is reduced when moving from plus/minus one year (49 IAS/IFRS; 21 US-GAAP firms) to longer periods of plus/minus two or plus/minus three years (23 IAS/IFRS /17 US-GAAP firms).

[Insert Table 8 about here]

The analysis of the *absolute* risk premium shows that in all cases both for IAS/IFRS and US-GAAP adopters such premia *increased* when a company moved from local to international reporting. The mean or median difference of the equity premium from after to before the switch "event" (rp_{t+1}-rp_{t-1}) is nearly in all cases *positive* (22

[66] See also Leuz/Verrecchia (2000), pp. 113-120 for an analysis of the development of indirect risk proxies around the switch "event" and Asbaugh/Pincus (2001), pp. 427-430 for the development of analyst forecasts after IAS adoption.

[67] Results were similar when using instead of average risk premia in the time window per and post the event specific points in time, for example, at a particular month plus/minus 12/24/36 month from a firm's switch date.

out of total 24), except for the OJN estimates in the years plus/minus one. While these two negative differences are insignificant, the positive mean differences further show to be highly statistically significant under parametric t-statistics for IAS/IFRS and also for US-GAAP in the periods plus/minus two and three years. The positive median differences are mostly statistically significant under RIV estimation, but not significant under OJN in the case of IAS/IFRS and only weakly significant for US-GAAP in the periods plus/minus two and three. The result of increasing risk premia contrary to initial expectations, however, has to be judged on the background of the overshadowing general trend of rising return expectations over the sample period. The monotonously increasing magnitude of the difference in expected returns when moving from plus/minus one year to plus/minus two and three years would support this explanation.

When looking at the *relative* risk premium controlling for the market trend, a different picture emerges. The always negative mean and median relative risk premia initially demonstrate that the switch firms come from "traditional" industries and are on average less risky than the general market. Looking at expected return differences around the switch, they show to be in the majority of cases *negative* (19 out of total 24) which means that relative risk premia *decreased* after adoption of IAS/IFRS and US-GAAP in line with initial expectations. However, in five cases particularly under IAS/IFRS in the short run, this difference turns *positive*. Further, they show to be statistically significant only for the mean differences and when using the RIV approach in the periods plus/minus three for IAS/IFRS and plus/minus two years for US-GAAP (in two out of total 24 cases). Accordingly, I overall fail to document significant effects of the adoption of international standards on the expected relative risk premia of switching firms, both for IAS/IFRS and US-GAAP adopters.

Altogether, when applying expected cost of equity estimates assuming long-term growth rates, neither the cross-sectional, nor the time series analysis indicate any clear effect of the type of reporting standards applied whatsoever on the cost of equity capital.

3.2.3. Estimation of Expected Cost of Equity Capital and Growth Simultaneously

When estimating the expected cost of equity capital simultaneously with the expected long-term growth rates (instead of assuming it as in the previous sections), only estimation at the portfolio level is possible which raises several control issues. In order to compare the effect of different accounting standards applied across portfolios, they should else reflect comparable risk characteristics.

In order to control for individual firm's risk, my first "event"-type approach pools all switch firm-observations plus and minus two years relative to the month when their first international report was published and compares the estimates under ETSS (2002) and Easton (2004) regressions before to after the switch. By including exactly the same firms in the pre- and post-sample, I control for the other risk characteristics of the portfolios, except shifts in return expectations over time.

However, the observed trend of rising return expectations over time when estimating required returns assuming long-term growth stresses the necessity to control for such a potential trend here. Accordingly, in my second approach, I choose a set of firms from the industrial sector which face comparable business risks and of which firms have switched to international standards over time. Absent the possibility to use a paired-sample approach due to the unavailability of proper matches for most switching companies, I form at each third Thursday in September from 1997 to 2002 two portfolios, one for the group of local and one for the group of international GAAP reporters. Note that the composition of firms in the two portfolios thus changes over time reflecting the increasing (decreasing) number of international (local) GAAP reporters. I then compare each year at the same point in time the estimated expected cost of capital and growth rates for the local and the international GAAP reporters. Accordingly, in this approach, I control for time, but compare across portfolios of firms with potentially differing risk characteristics not captured by industry.

Table 9, Panel A presents results using my first "event"-type approach and applying ETSS (2002) and Easton (2004) type regressions on the initial set of 54 switch firm observations winsorized by individual outliers. The coefficients of the two regressions are positive as expected and highly significant. Under ETSS (2002), the intercept is with 0.2839 pre-switch lower than the smallest value reported for the

U.S., but in case of post-switch (0.3941) within the U.S. range. The values of the slope coefficients are also on the lower end of ETSS (2002). The explanation power instead is comparable to prior research as adjusted R-squares are with 52.54% pre-switch and 47.85% post-switch even higher than in ETSS (2002) (42 %).[68] Under Easton (2004), intercepts are as expected close to zero (0.0091; 0.0094) and slopes close to one (0.9990; 1.1430), but adjusted R^2's with 90.30% (83.92%) lower than in Easton (2004) (99%).[69]

The estimates of *r* under the methodology of ETSS (2002) and Easton (2004) show *increasing* cost of equity capital after the switch to IAS/IFRS or US-GAAP. Using the methodology of ETSS (2002), expected rates of return increase from 9.57% pre- to 11.84% post-switch. Under the methodology of Easton (2004), they even enlarge from 9.51% to 19.20%. Further, not only return expectations, but also projected long-term growth rates rise from 6.45% pre- to 8.66% post-switch under ETSS (2002) and even from -0.10% to 14.30% under Easton (2004). The finding of higher long-term growth rates in earnings under international rules thus further documents *generally* rising future expectations in the period during which most firms adopted international standards.

Table 9, Panel B shows descriptive statistics for the distributions of expected cost of equity capital and projected long-term growth rates pre- and post-switch when applying the bootstrapping method. Figure 1 plots the estimates of *r* and g (*Δagr*) obtained under these 1000 regressions. Generally, mean and median estimates under bootstrapping are close to the values determined under the regressions using the regular sample in Panel A. Bootstrapping adds by documenting the dispersion of the estimates depending on the various subsamples drawn and by enabling statistical testing of differences in the estimates pre- and post-switch. These differences in expected cost of capital and future growth rates show to be highly statistically significant, thus underline the significance of the *increasing* rates after IAS/IFRS or US-GAAP adoption.

This shift in return expectations can also be seen in figure 1, Panel A for the ETSS (2002) regressions. The overall shape of the histograms of *r* and *g* pre- (Panel A1)

[68] See ETSS (2002), pp. 664-665, also Cuijpers/Buijink (2003), p. 43.
[69] See Easton (2004), pp. 83-85. My inferior fit statistics for this second approach reflect the much smaller sample size and thus the impossibility to form reasonable portfolios on the magnitude of the PEG ratio.

and post- (Panel A2) switch look similar, however the entire post-switch distributions have shifted towards higher values. Looking further at the statistical summary metrics in table 9, Panel B reveals that the dispersion of the estimates has also increased after the switch equally applying to the standard deviation, interquartile range (IQR) and total range of the distributions. While increased dispersion in the estimates post-switch is comparatively small under ETSS (2002), it is large under Easton (2004). Figure 1, Panel B documents this graphically. While the spreading in the estimates of *r* and *Δagr* pre-switch is higher than under ETSS (2002), but still within a reasonable band, the dispersion of the variables post-switch questions the meaningfulness of the obtained *average* cost of equity capital and growth rate estimates. For example, the mean cost of capital estimate r_{post} of 20.70% under Easton (2004) has a standard deviation of 6.71% and a range of 40.60%. The dispersion of the long-term growth rate *Δagr* post-switch is even higher. Taken these results together, they document that the divergence of expected cost of equity capital estimates of the same firms included in the portfolios increased considerably after IAS/IFRS or US-GAAP adoption. Besides changes in general market expectations, this could also be interpreted as indication that not only IAS/IFRS or US-GAAP adoption *per se*, but also the "style of application" of these rules or the specific competitive and institutional environment of an adopting firm determines changes in cost of capital. The Easton (2004) approach, utilizing only current market price and one and two-year ahead expectations naturally is more sensitive to such changes than the ETSS (2002) approach which also exploits information in mid-term projections and book value of equity.

The second approach includes only the switch firms which can be classified as "industrial" (SIC codes 20 to 39 for Manufacturing, n=39). Table 9, Panel C lists the number of firms included in the international (n_{Int}) and local (n_{HGB}) GAAP portfolios from 1997 until 2001 with available observations used for bootstrapping ranging from a minimum of 7 to a maximum of 29. The reported median differences in expected cost of equity capital between international and local reporting show to be *positive* in 4 out of 5 years under the RIV model (except in 1998) indicating that required returns for firms in similar industries and measured at the same points in time are in the majority of cases *higher* for IAS/IFRS or US-GAAP adopters. These differences further show to be highly statistically significant using parametric or non-parametric test statistics. Under Easton (2004), the

estimates generally are more volatile than under ETSS (2002) and also median differences in $r_{Int.}$ versus r_{HGB} show unreasonable extreme values in 2000 and 2001 around the time when the stock markets in Germany crashed. Even more, the results are diverging among the two models in 1997, 1998 and 1999. Across the two models and over 5 years, therefore, no clear picture emerges overall as the differences in cost of capital among the international and local GAAP reporters are positive in 6 and negative in 4 cases.

4. Conclusions

In this paper, I investigate empirically the common claim that financial reporting under internationally accepted standards lowers the cost of equity capital of adopting firms. Using a large set of German companies which pre-adopted the compulsory IFRS adoption in the EU from 2005/2007, I find no supporting evidence for such a conjecture. In the cross-section, other risk factors statistically show to be more important determinants of a firm's expected returns. In the time-series, average changes in required returns are insignificant with a substantial variation in individual firms' changes in expected cost of equity capital after IAS/IFRS or US-GAAP adoption. These empirical results largely question the widespread notion that adopting internationally recognized reporting standards, *per se*, leads to the economic benefits of lower cost of equity capital for adopting firms.

One basic explanation for these findings could be the general difficulties in estimating the cost of equity capital and the potential imprecision of the implied estimates based on analyst forecasts, particularly when utilized across different accounting standards. However, implied estimation can be considered the state-of-the-art methodology in accounting research as of today and has been used by related research which has achieved in documenting significant differences in the cost of equity capital across firms or jurisdictions, both when measured within (Botosan 1997) and across accounting regimes (Hail/Leuz 2003).

A competing explanation could be the nature of the internationalization process in Germany itself. The transition from the "Bilanzrecht" to the "International Accounting Standards" (Van Hulle 2003) has resulted in a rich accounting diversity with firms alternatively reporting under HGB, IAS/IFRS or US-GAAP. In fact, this

process has increased the magnitude of available information about selected individual firms, but has also decreased the comparability of financial reports within Germany. The variety and speed of the "accounting revolution" may have affected the apparent uncertainty among investors during this transition period. Empirical findings of decreasing analyst forecast accuracy after non-local GAAP adoption (Cuijpers/Buijink 2003) as well as articles in the financial press describing such difficulties would support this reasoning.

Alternatively, generally insignificant differences in the cost of capital among local GAAP, IAS/IFRS and US-GAAP adopters would also be consistent with the view that the financial reporting standards applied are not as important as other (more fundamental) risks factors. They would further be consistent with the view that the institutional factors rather than the accounting standards applied largely determine the quality of financial reporting. The fact that Hail/Leuz (2003) manage to document significantly different cost of equity capital across the effectiveness of a country's legal institutions and securities regulations whereas differences appear to be rather small across accounting regimes when holding the institutional setting constant in this study would support such line of argument.

In order to distinguish between these competing explanations, future research should exploit the substantial variation in the changes in cost of equity capital between firms adopting IFRS or US-GAAP and should try to better understand under which conditions and circumstances both within and across countries and jurisdictions the adoption of IFRS leads a to measurable and economically significant reductions in firms' cost of capital. The variation in adoption strategies, "style of application" of the rules as well as corporate governance and ownership affecting reporting incentives across firms within Germany and in particular the institutional background of the countries around the world adopting IFRS will offer a rich testing field for such an analysis in the future.

REFERENCES

American Accounting Association's Financial Accounting Standards Committee (AAA) (1998): "Criteria for Assessing the Quality of an Accounting Standard", in: Accounting Horizons, Vol. 12, No. 2, pp. 161-162.

Asbaugh, Hollis/Olssen, Per (2002): "An Explanatory Study of the Valuation Properties of Cross-Listed Firms' IAS and U.S. GAAP Earnings and Book Values", in: Accounting Review, Vol. 77, pp. 107-127.

Asbaugh, Hollis/Pincus, Morton (2001): "Domestic Accounting Standards, International Accounting Standards, and the Predictability of Earnings", in: Journal of Accounting Research, Vol. 39, No. 3, pp. 417-434.

Auer, Kurt V. (1998): „Der Einfluß des Wechsels vom Rechnungslegungsstandard auf die Risikoparameter von schweizerischen Aktien", in: ZfbF 2, pp. 129-155.

Baiman, Stanley/Verrecchia, Robert E. (1996): "The Relation among Capital Markets, Financial Disclosure, Production Efficiency, and Insider Trading", in: Journal of Accounting Research, Vol. 34, No. 1, pp. 1-22.

Ball, Ray/Kothari, S.P./Robin, Ashok (2000): "The effect of international institutional factors on properties of accounting earnings", in: Journal of Accounting and Economics, Vol. 29, pp. 1-51.

Ball, Ray/Robin, Ashok/Wu, Joanna Shuang (2003): "Incentives versus standards: properties of accounting income in four East Asian countries", in: Journal of Accounting and Economics, Vol. 36, pp. 235-270.

Ballwieser, Wolfgang (1997): „Grenzen des Vergleichs von Rechnungslegungssystemen – dargestellt anhand von HGB, U.S. GAAP und IAS", in: Aktien- und Bilanzrecht, (ed.) K. Forster, pp. 371-391.

Barth, Mary E./Clinch, Greg/Shibano, Toshi (1999): "International Accounting Harmonization and Global Equity Markets", in: Journal of Accounting and Economics, Vol. 26, pp. 201-235.

Born, Karl (2002): „Rechnungslegung International: Konzernabschlüsse nach IAS, US-GAAP, HGB und EG-Richtlinien", 3. Auflage.

Botosan, Christine A. (1997): "Disclosure Level and the Cost of Equity Capital", in: Accounting Review, Vol. 72, No. 3, pp. 323-349.

Botosan, Christine A./Plumlee, Marlene A. (2002): "A Re-examination of Disclosure Level and the Expected Cost of Equity Capital", in: Journal of Accounting Research, Vol. 40, No. 1, pp. 21-40.

Breker, Norbert/Naumann, Klaus-Peter/Tielmann, Sandra (1999): „Der Wirtschaftsprüfer als Begleiter der Internationalisierung der Rechnungslegung“, in: Die Wirtschaftsprüfung, Heft 4/5, pp. 140-154, 185-195.

Busse von Colbe, Walter (1995): „Zur Anpassung der Rechnungslegung von Kapitalgesellschaften an internationale Normen“, in: Zeitschrift für betriebswirtschaftliche Forschung und Praxis, Heft 4, pp. 373-391.

Busse von Colbe, Walther (2002): „Entwicklungsperspektiven der Rechnungslegung in Deutschland“, in: ZfbF 54, pp. 159-172.

Chen, Shimin/Sun, Zheng/Wang, Yuetang (2002): “Evidence from China on whether harmonized accounting standards harmonize accounting practices”, in: Accounting Horizons, Vol. 16, No. 3, pp. 183-198.

Clarkson, Pete/Guedes, Jose/Thompson, Rex (1996): “On the Diversification, Observability, and Measurement of Estimation Risk”, in: Journal of Financial and Quantitative Analysis, March, pp. 69-84.

Claus, James/Thomas, Jacob (2001): “Equity Premia as Low as Three Percent? Evidence from Analysts’ Earnings Forecasts for Domestic and International Stock Markets”, in: Journal of Finance, Vol. LVI, No. 5, pp. 1629-1666.

Coles, Jeffrey L./Loewenstein, Uri/Suay, Jose (1995): “On Equilibrium Pricing under Parameter Uncertainty”, in: Journal of Financial and Quantitative Analysis, Vol. 30, No. 3, pp. 347-364.

Comprix, Joseph J./Muller III, Karl A./Stanford-Harris, Mary (2002): “Economic Consequences from Mandatory Adoption of IASB Standards in the European Union”, Working Paper, Penn State University, July 2002.

Cuijpers, Rick/Buijink, Willem (2003): “Voluntary adoption of non-local GAAP in the European Union: a study of determinants and consequences”, Working Paper, Universiteit Maastricht, May 2003.

Daske, Holger/Gebhardt, Günther/Klein, Stefan (2004): “Estimating the Expected Cost of Equity Capital Using Consensus Forecasts”, in: Working Paper Series: Finance & Accounting, No. 124, Johann Wolfgang Goethe-Universität Frankfurt am Main.

Diamond, Douglas W./Verrecchia, Robert E. (1991): “Disclosure, Liquidity, and the Cost of Capital”, in: Journal of Finance, Vol. XLVI, No. 4, pp. 1325-1359.

DRSC: DRS 1 „Befreiender Konzernabschluss nach § 292a HGB“, Berlin 2000.

Easley, David/O’Hara, Maureen (2004): “Information and the Cost of Capital”, in: Journal of Finance, forthcoming.

Easton, Peter (2003): “Recent research in accounting and finance that has had, and will have, a significant effect on the practice of valuation”, Presentation held at the Amsterdam-Nyrode Accounting Research Workshop 2003, Amsterdam.

Easton, Peter (2004): “PE Ratios, PEG Ratios, and Estimating the Implied Expected Rate of Return on Equity Capital”, forthcoming in: Accounting Review, Vol. 79, No. 1, pp. 73-95.

Easton, Peter/Harris, Trevor S./Ohlson, James A. (1992): “Aggregate accounting earnings can explain most of securities returns”, in: Journal of Accounting and Economics, Vol. 15, pp. 119-143.

Easton, Peter/Monahan, Steve (2003): “An Evaluation of the Reliability of Accounting Based Measures of Expected Returns: A Measurement Error Perspective”, Working Paper, University of Chicago, January 2003.

Easton, Peter/Taylor, Gary/Shroff, Pervin (2001): “Implications of Fading the Return-on-Equity to the Industry Median Return-on-Equity”, Working paper, Fisher College of Business, 2001.

Easton, Peter/Taylor, Gary/Shroff, Pervin/Sougiannis, Theodore (2002): “Using Forecasts of Earnings to Simultaneously Estimate Growth and the Rate of Return on Equity Investment”, in: Journal of Accounting Research, Vol. 40, No. 3, pp. 657-676.

Efron, Bradley/Tibshirani, Robert J. (1993): “An Introduction to the Bootstrap”.

Eller, Roland (2001): “Modernes Bondmanagement”, 2. Auflage.

Elton, Edwin J. (1999): “Expected Return, Realized Return and Asset Pricing Tests”, in: Journal of Finance, Vol. LIV, No. 4, pp. 1199-1220.

Elton, Edwin J./Gruber, Martin J. (1995): “Modern portfolio theory and investment analysis”, 5th edition.

EU COM (95) 508 (1995): „Accounting Harmonisation: A New Strategy Vis-à-Vis International Harmonisation”.

Ewert, Ralf (1999): „Rechnungslegung, Globalisierung und Kapitalkosten“, in: Zeitschrift für Controlling, Accounting & System-Anwendungen, krp-Sonderheft 3/99, pp. 39-46.

Fama, Eugene F./French, Kenneth R. (1992): “The Cross-section of Expected Stock Returns”, in: Journal of Finance, Vol. 47, No. 2, pp. 427-465.

Fama, Eugene F./French, Kenneth R. (1997): “Industry costs of equity”, in: Journal of Financial Economics”, Vol. 43, pp. 153-193.

Fama, Eugene F./French, Kenneth R. (2003): “The CAPM: Theory and Evidence”, Center for Research in Security Prices (CRSP) University of Chicago Working Paper No. 550, August 2003.

Fama, Eugene F./McBeth, J. (1973): “Risk, return and equilibrium: empirical tests”, in: Journal of Political Economy, Vol. 81, pp. 607-636.

Francis, Jennifer/LaFond, Ryan/Olsson, Per/Schipper, Katherine (2003): “Cost of Capital and Earnings Attributes”, Working Paper, Duke University, May 2003.

Francis, Jennifer/Olsson, Per/Oswald, Dennis R. (2000): “Comparing the Accuracy and Explainability of Dividend, Free Cash Flow, and Abnormal Earnings Equity Estimates”, in: Journal of Accounting Research, Vol. 38, No. 1, pp. 45-70.

Frankel, Richard/Lee, Charles M.C. (1998): “Accounting valuation, market expectation, and cross-sectional stock returns”, in: Journal of Accounting and Economics, Vol. 25, pp. 283-319.

GAAP Convergence (2002): “A Survey of National Efforts to Promote and Achieve Convergence with International Financial Reporting Standards”, (eds.) BDO, Deloitte Touche Tohmatsu, Ernst & Young, Grant Thornton, KPMG, PricewaterhouseCoopers.

Gebhardt, Günther (2000): “The Evolution of Global Standards in Accounting”, in: (eds.) Robert E. Litan and Anthony M. Santomero, Brookings-Wharton Papers on Financial Services 2000, pp. 341-376.

Gebhardt, Günther/Heilmann, Aaron A. (2004): “Enforcement of German and International Accounting Standards in Germany: The Case of Cash Flow Statements”, in: The Economics and Politics of Accounting, in: (eds.) Anthony Hopwood, Christian Leuz, and Dieter Pfaff, pp. 218-238.

Gebhardt, William R./Lee, Charles M.C./Swaminathan, Bhaskaran (2001): “Toward an Implied Cost of Capital”, in: Journal of Accounting Research, Vol. 39, No. 1, pp. 135-176.

Glaum, Martien/Street, Donna L. (2002): “Rechnungslegung der Unternehmen am Neuen Markt – Die Einhaltung der Ausweispflichten nach IAS und US-GAAP,” in: (eds.) R. von Rosen, Studien des Deutschen Aktieninstituts.

Gode, Dan/Mohanram, Partha (2002): “Inferring the Cost of Capital Using the Ohlson-Juettner Model”, Working paper, New York University, December 2002.

Gordon, Joseph R./Gordon, Myron J. (1997): “The Finite Horizon Expected Return Model”, in: Financial Analysts Journal, May/June, pp. 52-60.

Guay, Wayne/Kothari, S.P./Shu, Susan (2003): "Properties of Implied Cost of Capital Using Analysts' Forecasts", Working Paper 4422-03, MIT Sloan School of Management, July 2003.

Gujarati, Damodar N. (2003): Basic econometrics, 4th edition.

Hail, Luzi (2002): "The Impact of Voluntary Corporate Disclosure on the Ex ante Cost of Capital for Swiss Firms", in: European Accounting Review, Vol. 11, No. 4, pp. 741-773.

Hail, Luzi/Leuz, Christian (2003): "International Differences in Cost of Capital: Do Legal Institutions and Securities Regulation Matter?", Working Paper, The Wharton School, University of Pennsylvania.

Harris, Mary S./Muller III, Karl A. (1999): "The market valuation of IAS versus US-GAAP accounting measures using Form 20-F reconciliations", in: Journal of Accounting and Economics, Vol. 26, pp. 285-312.

Harris, Trevor S./Lang, Mark/Möller, Hans Peter (1994): "The Value Relevance of German Accounting Measures: An Empirical Analysis", in: Journal of Accounting Research, Vol. 32, No. 2, pp. 187-209.

Hayn, Sven/Graf Waldersee, Georg (2002): „IAS / US-GAAP / HGB im Vergleich: Systematische Darstellung für den Einzel- und Konzernabschluss", 3. Auflage.

Illingworth, David (2003): "World economy needs IAS", on: www.accountancyage.com/Print/1134927, September 18, 2003.

International Accounting Standards Board (IASB) (2002a): International Accounting Standards Committee Foundation, Annual Report 2002.

International Accounting Standards Board (IASB) (2002b): IASB Insight, October 2002.

International Accounting Standards Board (IASB) (2002c): IASB Insight, July 2002.

International Accounting Standards Committee Foundation (IASCF) (2002): Constitution, July 2002.

Joos, Peter (2000): "Discussion of The Economic Consequences of Increased Disclosure", Vol. 38 (Supplement), pp. 125-136.

Joos, Peter/Lang, Mark (1994): "The Effects of Accounting Diversity: Evidence from the European Union", in: Journal of Accounting Research, Vol. 32 (Supplement), pp. 141-168.

Kleekämper, Heinz (1995): „Aktuelle Entwicklungen beim IASC", Zeitschrift für Betriebswirtschaftliche Forschung und Praxis, Heft 4, pp. 41-65.

Köhler, Annette G./Marten, Kai-Uwe/Schlereth, Dieter/Crampton, Adrian (2003): „Praxisbefragung: Erfahrungen von Unternehmen bei der Umstellung der Rechnungslegung von HGB auf IAS/IFRS oder US-GAAP“, in: Betriebs-Berater, 58. Jg., Heft 49.

Lang, Mark H./Lundholm, Russell J. (1996): “Corporate Disclosure Policy and Analyst Behaviour”, in: Accounting Review, Vol. 71, No. 4, pp. 467-492.

Lee, Charles, M.C./Myers, James (1999): “What is the intrinsic value of the Dow ?”, in: Journal of Finance, Vol. 54, No. 5, pp. 1693-1742.

Leuz, Christian (2003): “IAS versus US GAAP: Information Asymmetry-Based Evidence from Germany’s New Market”, in: Journal of Accounting Research, Vol. 41, No. 3 (June), pp. 445-472.

Leuz, Christian/Nanda, Dhananjay/Wysocki, Peter D. (2003): “Earnings management and investor protection: an international comparison”, in: Journal of Financial Economics, Vol. 69, No. 3, pp. 505-527.

Leuz, Christian/Verrecchia, Robert E. (2000): “The Economic Consequences of Increased Disclosure”, in: Journal of Accounting Research, Vol. 38 (Supplement), pp. 91-124.

Leuz, Christian/Verrecchia, Robert E. (2004): “Firms’ Capital Allocation Choices, Information Quality, and the Cost of Capital”, Working Paper, The Wharton School, January 2004.

Leuz, Christian/Wüstemann, Jens (2003): “The Role of Accounting in the German Financial System”, Working Paper, No. 2003/16, Center for Financial Studies, Frankfurt/M.

Levitt, Arthur (1998): “The Importance of High Quality Accounting Standards”, in: Accounting Horizons, Vol. 12, No. 2, pp. 79-82.

Lewellen, Jonathan/Shanken, Jay (2002): “Learning, asset pricing tests, and market efficiency”, in: Journal of Finance, Vol. 57, No. 3, pp. 1113-1145.

Malkiel, Burton G./Xu, Yexiao (1997): “Risk and Return Revisited”, in: Journal of Portfolio Management, Vol. 23 (Spring), pp. 9-14.

Marten, Kai-Uwe/Schlereth, Dieter/Crampton, Adrian/Köhler, Annette G. (2002): „Rechnungslegung nach IAS – Nutzeneffekte aus Sicht von Eigenkapitalgebern“, in: Betriebs-Berater, 57. Jg., Heft 39, 25. September 2002.

McKinsey (2002): “Global Investor Opinion Survey on Corporate Governance”.

Mehra, Rajnish (2002): “The Equity Premium: Why Is It a Puzzle?”, in: Financial Analysts Journal, Jan/Feb 2003, Vol. 59, No. 1, pp. 54-60.

Modigliani, Franco/Miller, Merton (1958): “The Cost of Capital, Corporation Finance, and the Theory of Investment”, in: American Economic Review, Vol. XLVIII, No. 3, pp. 261-297.

Ohlson, James/Juettner-Nauroth, Beate E. (2000): “Expected EPS and EPS Growth as Determinants of Value”, Working paper, New York University, September 2000.

Pellens, Bernhard./Tomaszewski, Claude (1999): “Kapitalmarktreaktionen auf den Rechnungslegungswechsel zu IAS bzw. US-GAAP“, in: Rechnungswesen und Kapitalmarkt, (eds.) Günther Gebhardt und Bernhard Pellens, ZfbF Sonderheft 41, pp. 199-228.

Penman, Stephen H./Sougiannis, Theodore (1998): “A Comparison of Dividend, Cash Flow, and Earnings Approaches to Equity Valuation”, in: Contemporary Accounting Research, Vol. 15, No. 3, pp. 343-383.

Pownell, Grace/Schipper, Kathrine (1999): “Implications of Accounting Research for the SEC’s Consideration of International Accounting Standards for U.S. Securities Offerings”, in: Accounting Horizons, Vol. 13, pp. 259-280.

Radebaugh, Lee H./Gebhardt, Günther/Gray, Sidney J. (1995): “Foreign Stock Exchange Listings: A Case Study of Daimler-Benz”, in: Journal of International Financial Management and Accounting, pp. 158-192.

Regulation (EC) No. 1606/2002 of the European Parliament and of the Council of July 19, 2002 on the application of international accounting standards, O. J. No. L 243, September 9, 2002.

Richardson, Alan J./Welker, Michael (2001): “Social disclosure, financial disclosure and the cost of equity capital”, in: Accounting, Organizations and Society, Vol. 26, pp. 597-616.

Schildbach, Thomas (2004): „Rechnungslegung im Spannungsfeld zweier Kulturen der Regulierung“, in: Der Schweizer Treuhänder, 3/04, pp. 159-172.

Schipper, Kathrine (2000): “Accounting Research and the Potential Use of International Accounting Standards for Cross-Border Listings”, in: British Accounting Review, Vol. 32, pp. 243-256.

Schrand, Catherine/Verrecchia, Robert E. (2002): “Disclosure Choice and Cost of Capital: Evidence from Underpricing in Initial Public Offerings”, Working Paper, The Wharton School, December 2002.

Sengupta, Partha (1998): “Corporate Disclosure Quality”, in: Accounting Review, Vol. 73, pp. 459-474.

Spanheimer, Jürgen (2002): „Internationale Rechnungslegung: Hintergründe, Entwicklungstendenzen, Folgewirkungen“.

Stahl, Anne B. (2002): „Wechsel von HGB auf IAS oder US-GAAP – Untersuchung der Motive und der organisatorischen Umsetzung in der Praxis“, in: Zeitschrift für Controlling, Accounting & System-Anwendungen, krp-Kostenrechnungspraxis, 46. Jg., Heft 1, pp. 33-36.

Steiner, Manfred/Bruns, Christian (2000): „Wertpapiermanagement“, 7. Auflage.

Stulz, René M. (1999): “Globalization, corporate finance, and the cost of capital”, in: Journal of Applied Corporate Finance, Vol. 12, No. 3, pp. 8-25.

The IASC-U.S. Comparison Project (1999): “A Report on the Similarities and Differences between IASC Standards and U.S. GAAP”, Financial Accounting Standards Board.

Thomson Financial (2003): Glossary I/B/E/S Summary History – Version 2.0.

Van Hulle, Karel (2003): „Von den Bilanzrichtlinien zu International Accounting Standards“, in: Die Wirtschaftsprüfung, Heft 18/2003.

Verrecchia, Robert E. (2001): “Essays on disclosure”, in: Journal of Accounting and Economics, Vol. 32, pp. 91-180.

Wagenhofer, Alfred (2003): „Internationale Rechnungslegungsstandards - IAS/IFRS“, 4. Auflage.

Zhang, Xiao-Jun (2000): “Conservative accounting and equity valuation”, in: Journal of Accounting and Economics, Vol. 29, pp. 125-149.

TABLE 1

The Process towards Internationalization of Financial Reporting in Germany

Year	1993		1994		1995		1996		1997		1998		1999		2000		2001		2002	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
HGB	206	99.52%	221	97.79%	224	95.73%	199	94.31%	296	93.08%	268	82.72%	174	49.71%	114	29.77%	99	21.81%	68	22.15%
IAS/IFRS	1	0.48%	4	2.21%	9	3.85%	8	3.79%	15	4.72%	34	10.49%	108	30.86%	144	37.60%	183	40.31%	121	39.41%
US-GAAP	0	0.00%	0	0.00%	1	0.43%	4	1.90%	7	2.20%	22	6.79%	68	19.43%	125	32.64%	172	37.89%	118	38.44%
All	207	100%	226	100%	234	100%	211	100%	318	100%	324	100%	350	100%	383	100%	454	100%	307	100%

This table presents the number of listed firms in Germany reporting under local GAAP (HGB), IAS/IFRS, and US-GAAP from 1993 to 2002. The total number of observations is determined by pooling all available firms from *Datastream*, *Worldscope* and the *Frankfurt Stock Exchange*. For each firm-year observation, the accounting standards applied as described in the auditor's statement of the financial reports is selected. The full set of firms are listed in Panel A, while only the firms used in this study after sample selection procedures are in Panel B.

TABLE 2

Definition of Variables and Data Sources

Input Variable	Symbol	Description in Database
Forecasted EPS	$feps_{t+n}$	I/B/E/S *Median EPS Estimate for periods 1 to 5*
RIV-Long term growth LTG	g^{ltg}	I/B/E/S *Long Term Growth*
Book value of equity (BVE)	BV_t	WORLDSCOPE *Total Common Equity*
No. of shares outstanding		I/B/E/S *Shares Outstanding (in Mio.)*
BVE per share	$bvps_n$	*Total Common Equity/ Shares Outstanding*
Payout ratio	k	WORLDSCOPE *Div Payout Ratio*
Share price	p_t	I/B/E/S *Price*
Target-ROE		Median of Industry ROE over the past 5 years
OJN-Short-term growth rate	g_2	Average growth of earnings from t+1 to t+2 and I/B/E/S growth rate
OJN-Long-term growth rate	γ	Inflation rate, proxy as risk free rate of return minus 3% ($r_f - 3\%$)
Industry		WORLDSCOPE *SIC Code*
Estimation Date	t	Estimation date, one per month
Risk free rate of return	r^f	DATASTREAM *REX BOND SUB INDEX CURRENT,10 YRS – R.Y.*

This table presents the definitions, symbols and data sources of the input variables used to estimate the expected cost of equity capial under the estimation procedures. Data comes from *I/B/E/S*, *Datastream* and *Worldscope*.

TABLE 3

Sample Selection

Description	No.	Percent
I/B/E/S dataset	69,785	100.00%
Shares outstanding data missing	(594)	0.85%
Share price data missing	(690)	0.99%
Accounting data missing	(10,019)	14.36%
Target ROE data missing	(814)	1.17%
At least three future EPS-estimators or two future EPS-estimates and LTG	(24,963)	35.77%
Stacked forecasts	(3,295)	4.72%
Insolvency estimates	(517)	0.74%
Data before 1993	(4,062)	5.82%
Missing information on type of Reporting Standards applied	(472)	0.67%
Final dataset (735 firms)	24,359	34.91%
HGB (377 full reporting and 76 pre-switch firms)	16,250	65.44%
IAS/IFRS (155 full reporting and 52 post-switch firms)	4,567	18.39%
US-GAAP (127 full reporting and 24 post-switch firms)	3,542	14.26%

This table presents sample selection procedures. Data comes from *I/B/E/S*, *Datastream* and *Worldscope*. Information on the accounting standards applied comes from the auditor's statement of the annual reports. Full reporting firms are firms which entirely reported under one set of financial reporting standards. Switch firms are firms which adopted international standards during the investigation period 1993-2002. Pre-switch means firms with available local GAAP (HGB) observations before the switch. Post-switch means firms with available IAS/IFRS or US-GAAP observations after the switch.

TABLE 4

Expected Cost of Equtiy Capital Estimates

Variable	N	Mean	Median	StDev	Min	Q1	Q3	Max
Panel A: Results pooled across all years in Germany								
Panel A1: All Firms								
Total								
r_{RIV}	24,359	11.44%	9.92%	6.12%	0.95%	7.38%	13.66%	53.79%
r_{OJN}	19,973	11.72%	10.79%	4.80%	2.48%	8.64%	13.68%	78.19%
HGB								
r_{RIV}	16,250	9.85%	9.12%	4.24%	2.04%	6.96%	11.79%	49.13%
r_{OJN}	14,006	11.10%	10.50%	3.90%	3.28%	8.44%	13.09%	42.38%
IAS/IFRS								
r_{RIV}	4,567	14.34%***	12.46%***	7.57%	0.95%	8.87%	18.13%	44.19%
r_{OJN}	3,516	13.21%***	11.68%***	5.79%	2.95%	9.23%	15.53%	50.05%
US-GAAP								
r_{RIV}	3,542	14.99%***	13.43%***	8.11%	1.06%	8.96%	19.27%	53.79%
r_{OJN}	2,451	13.13%***	11.64%***	6.75%	2.48%	8.95%	15.16%	78.19%
Panel A2: Switch Firms								
Total								
r_{RIV}	6,459	9.30%	8.59%	3.76%	1.41%	6.69%	11.02%	35.64%
r_{OJN}	6,015	10.69%	10.00%	3.61%	2.95%	8.31%	12.41%	42.10%
HGB								
r_{RIV}	4,064	8.56%	7.85%	3.26%	2.20%	6.43%	9.96%	28.37%
r_{OJN}	3,740	10.34%	9.90%	3.16%	3.36%	8.16%	12.13%	23.83%
IAS/IFRS								
r_{RIV}	1,564	10.27%***	9.62%***	4.06%	3.16%	7.36%	12.19%	30.12%
r_{OJN}	1,479	10.97%***	10.07%***	3.70%	2.95%	8.49%	12.56%	33.15%
US-GAAP								
r_{RIV}	831	11.06%***	10.14%***	4.35%	1.41%	8.05%	13.58%	35.64%
r_{OJN}	796	11.79%***	10.44%***	4.91%	4.35%	8.61%	13.48%	42.10%

Year	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Panel B: Results for individual years in Germany										
Panel A1: Average Expected Cost of Capital										
r_{RIV}	7.75%	7.53%	8.40%	9.04%	8.85%	9.79%	11.49%	11.53%	15.39%	17.12%
r_{OJN}	9.22%	10.14%	11.49%	10.70%	10.39%	10.42%	11.17%	11.44%	14.50%	15.28%
Panel A2: Average Market Risk Premium										
rp_{RIV}	1.48%	1.02%	1.93%	3.44%	3.73%	5.40%	7.28%	6.31%	10.81%	12.58%
rp_{OJN}	2.98%	3.59%	5.03%	5.12%	5.27%	6.05%	6.96%	6.22%	9.91%	10.76%

*** Mean (median) difference in expected cost of equity capital between local GAAP (HGB) and IAS/IFRS or US-GAAP is significant at the 1% level using *t*-test (Wilcoxon rank sum-test), two-tail. Results are for a sample of German firms from 1993-2002 utilizing data from *I/B/E/S*, *Datastream* and *Worldscope* to estimate the expected cost of equity capital under the residual income valuation model (r_{RIV}) and the Ohlson/Jüttner-Nauroth (2001) model (r_{OJN}) assuming long-term growth. The "All Firms" sample comprises all observations, the "Switch Firms" sample only observations from firms which have switched from local to international standards during the investigation period. Auditor's statements in the financial reports classify firms according to the reporting standards applied. The average expected cost of equity capital (market risk premium) is the yearly equally weighted average of all firms in the sample. Market risk premium is calculated by deducting from the expected cost of equity capital the risk free-rate of return (REX-Index return). When regressing expected cost of equity capital (r_{RIV}, r_{OJN}) or risk premium (rp_{RIV}, rp_{OJN}) on a time count variable, its' coefficients always show to be positive and highly significant at the 1% level.

TABLE 5

Descriptive Statistics for Control Variables

Panel A1: All Firms

	Reporting	N	Mean	Median	StDev	Min	Q1	Q3	Max
Rex	All	24,359	5.10%	5.02%	0.87%	3.49%	4.59%	5.48%	7.36%
	HGB	16,494	5.29%	5.20%	0.96%	3.49%	4.65%	5.99%	7.36%
	IAS/IFRS	4,644	4.73%	4.75%	0.47%	3.49%	4.50%	5.03%	7.06%
	US-GAAP	3,594	4.70%	4.72%	0.44%	3.49%	4.50%	5.03%	5.99%
Beta	All	16,111	0.953	0.877	0.613	-0.391	0.553	1.196	6.281
	HGB	11,739	0.830	0.832	0.400	-0.170	0.527	1.101	2.304
	IAS/IFRS	2,539	1.167	1.008	0.789	-0.391	0.616	1.604	4.212
	US-GAAP	1,833	1.443	1.157	1.010	-0.210	0.741	2.014	6.281
Vola	All	18,751	0.289	0.222	0.264	0.000	0.083	0.382	1.745
	HGB	12,386	0.215	0.199	0.158	0.019	0.069	0.322	1.239
	IAS/IFRS	3,583	0.400	0.279	0.335	0.000	0.126	0.649	1.745
	US-GAAP	2,782	0.480	0.369	0.371	0.018	0.150	0.786	1.644
DM	All	24,359	2.879	1.139	5.336	-0.207	0.396	2.745	100.295
	HGB	16,250	3.430	1.557	5.679	0.017	0.685	3.355	100.295
	IAS/IFRS	4,568	2.477	0.553	5.536	-0.105	0.122	1.979	69.893
	US-GAAP	3,545	0.870	0.271	1.640	-0.207	0.080	0.934	20.816
No.	All	24,359	14.278	11.000	11.775	1.000	4.000	23.000	49.000
	HGB	16,447	15.578	13.000	11.757	1.000	5.000	25.000	47.000
	IAS/IFRS	4,624	11.763	6.000	11.474	1.000	3.000	19.000	48.000
	US-GAAP	3,576	11.553	6.000	11.242	1.000	3.000	17.000	49.000
Ln_size	All	24,359	5.852	5.598	1.913	0.789	4.486	7.142	11.766
	HGB	16,250	5.905	5.670	1.687	1.058	4.693	7.115	10.869
	IAS/IFRS	4,567	5.698	5.375	2.273	0.789	3.949	7.335	11.408
	US-GAAP	3,542	5.809	5.545	2.327	1.318	4.022	7.104	11.766
BM	All	24,359	0.827	0.557	1.009	0.001	0.325	0.952	21.289
	HGB	16,250	0.796	0.578	0.783	0.024	0.370	0.916	12.338
	IAS/IFRS	4,567	0.987	0.511	1.601	0.001	0.215	1.106	21.289
	US-GAAP	3,542	0.765	0.486	0.919	0.001	0.147	0.990	7.464
RP_Lag	All	24,359	5.15%	4.19%	4.31%	-3.30%	2.03%	7.65%	19.89%
	HGB	16,493	3.52%	3.08%	3.09%	-3.30%	1.36%	5.35%	16.93%
	IAS/IFRS	4,648	7.91%	7.65%	4.62%	0.74%	3.90%	10.51%	19.89%
	US-GAAP	3,595	9.09%	9.33%	4.33%	1.37%	6.34%	11.45%	19.89%
Time	All	24,359	69.635	75.000	33.473	1.000	43.000	98.000	120.000
	HGB	16,572	55.183	56.000	30.428	1.000	30.000	78.000	120.000
	IAS/IFRS	4,653	97.523	101.000	17.189	27.000	89.000	110.000	120.000
	US-GAAP	3,606	100.067	102.000	13.771	40.000	93.000	111.000	120.000

Panel A2: Switch Firms

	Reporting	N	Mean	Median	StDev	Min	Q1	Q3	Max
Rex	All	6,459	5.13%	5.06%	0.88%	3.49%	4.60%	5.52%	7.36%
	HGB	4,112	5.37%	5.26%	0.97%	3.49%	4.68%	6.00%	7.36%
	IAS/IFRS	1,579	4.77%	4.82%	0.54%	3.49%	4.50%	5.20%	7.06%
	US-GAAP	839	4.65%	4.68%	0.45%	3.49%	4.30%	4.94%	5.99%
Beta	All	6,459	0.895	0.884	0.423	-0.391	0.621	1.138	3.259
	HGB	3,058	0.940	0.938	0.384	-0.118	0.687	1.195	2.280
	IAS/IFRS	1,243	0.768	0.770	0.459	-0.391	0.439	1.008	3.259
	US-GAAP	710	0.921	0.827	0.474	0.017	0.639	1.088	2.957
Vola	All	5,242	0.202	0.158	0.163	0.014	0.066	0.319	1.450
	HGB	3,236	0.184	0.157	0.142	0.019	0.058	0.284	0.644
	IAS/IFRS	1,269	0.230	0.157	0.192	0.014	0.070	0.364	1.450
	US-GAAP	737	0.237	0.172	0.183	0.024	0.083	0.374	1.014
DM	All	6,395	4.096	1.829	6.232	0.000	0.872	3.733	69.893
	HGB	4,033	4.139	1.908	5.966	0.028	1.061	3.760	47.827
	IAS/IFRS	1,544	5.119	1.975	7.791	0.003	0.685	5.416	69.893
	US-GAAP	818	1.948	1.064	2.651	0.000	0.453	2.357	20.816
No.	All	6,373	25.652	28.000	11.006	1.000	18.000	34.000	48.000
	HGB	4,000	26.486	29.000	10.872	1.000	19.000	35.000	47.000
	IAS/IFRS	1,551	24.215	26.000	10.753	1.000	16.000	32.000	48.000
	US-GAAP	822	24.305	27.000	11.701	1.000	15.000	34.000	44.000
Ln_size	All	6,348	7.589	7.753	1.787	1.295	6.224	8.960	11.419
	HGB	3,984	7.392	7.562	1.624	2.584	6.165	8.669	10.869
	IAS/IFRS	1,533	7.843	8.188	1.879	1.295	6.459	9.267	11.408
	US-GAAP	831	8.065	8.110	2.171	2.238	6.338	10.124	11.419
BM	All	6,443	0.691	0.544	0.684	0.013	0.357	0.811	12.338
	HGB	4,034	0.644	0.538	0.582	0.029	0.353	0.782	12.338
	IAS/IFRS	1,570	0.822	0.544	0.943	0.018	0.386	0.934	10.058
	US-GAAP	839	0.670	0.604	0.512	0.013	0.349	0.860	4.231
RP_Lag	All	6,459	3.90%	3.39%	3.21%	-3.30%	1.38%	6.22%	16.93%
	HGB	4,101	2.87%	2.23%	2.86%	-3.30%	0.89%	4.73%	11.45%
	IAS/IFRS	1,580	5.17%	4.73%	2.88%	0.74%	2.91%	7.65%	16.93%
	US-GAAP	830	6.63%	6.61%	2.97%	1.37%	4.11%	8.67%	16.93%
Time	All	6,459	65.901	69.000	32.739	1.000	40.000	93.000	120.000
	HGB	4,116	50.175	51.000	27.771	1.000	27.000	72.000	113.000
	IAS/IFRS	1,580	89.712	94.000	22.405	27.000	78.000	108.000	120.000
	US-GAAP	841	98.131	102.000	17.321	40.000	89.000	111.000	120.000

This table shows descriptive statistics for the control variables of a sample of German firms from 1993-2002: Rex is the proxy for the risk-free rate of return measured by the REX-Index return (*Datastream*); Beta is the five year rolling over beta against the CDAX-Market Index using monthly returns (*Datastream*); Vola is the standard deviation of the previous years daily returns, measured over 250 trading days (*Datastream*); DM is the ratio of long-term debt to market capitalization (*Worldscope*, *Datastream*); No. is the number of analyst following (*I/B/E/S*); Ln_size is the natural log of firm size in millions € (*I/B/E/S*); BM is the book to market ratio of equity (*Worldscope*, *I/B/E/S*); RP_Lag is the previous years risk premium of the firm's industry (Own calculation); Time is a monthly count variable ranging from January 1993 (=1) to December 2002 (=120); IAS/IFRS is a dummy variable, 1 if IAS/IFRS, 0 otherwise (Annual report); US-GAAP Dummy variable, 1 if US-GAAP, 0 otherwise (Annual report). The "All Firms" sample comprises all observations, the "Switch Firms" sample only observations from firms which have switched from local to international standards during the investigation period.

TABLE 6

Correlations of Variables

Panel A1: All Firms

	r_{RIV}	r_{OJN}	Rex	Beta	Vola	DM	No.	ln_size	BM	RP_Lag	Time	IAS/IFRS	US-GAAP
r_{RIV}	1.000	0.692	-0.322	0.293	0.372	0.021	-0.367	-0.565	0.568	0.631	0.488	0.227	0.239
r_{OJN}	0.603	1.000	-0.148	0.173	0.214	0.033	-0.260	-0.413	0.387	0.323	0.313	0.143	0.109
Rex	-0.373	-0.145	1.000	-0.039	-0.237	0.016	0.220	0.095	-0.135	-0.452	-0.723	-0.205	-0.190
Beta	0.113	0.096	0.029	1.000	0.378	-0.047	0.046	-0.115	0.123	0.223	0.135	0.151	0.286
Vola	0.273	0.148	-0.244	0.202	1.000	-0.042	-0.252	-0.280	0.159	0.361	0.372	0.203	0.301
DM	0.060	0.117	0.079	0.015	-0.116	1.000	0.076	0.100	0.279	-0.190	-0.059	-0.036	-0.155
No.	-0.376	-0.254	0.208	0.172	-0.198	0.210	1.000	0.711	-0.158	-0.341	-0.314	-0.103	-0.095
ln_size	-0.586	-0.426	0.130	-0.022	-0.255	0.026	0.683	1.000	-0.406	-0.327	-0.143	-0.039	-0.009
BM	0.530	0.352	-0.087	0.020	0.060	0.552	-0.069	-0.421	1.000	0.190	0.172	0.076	-0.025
RP_Lag	0.643	0.308	-0.497	0.036	0.328	-0.313	-0.342	-0.318	0.070	1.000	0.708	0.308	0.377
Time	0.515	0.294	-0.675	0.019	0.331	-0.210	-0.317	-0.171	0.086	0.746	1.000	0.400	0.375
IAS/IFRS	0.205	0.118	-0.201	0.115	0.158	-0.175	-0.117	-0.051	-0.041	0.295	0.415	1.000	-0.198
US-GAAP	0.204	0.072	-0.191	0.177	0.217	-0.309	-0.096	-0.031	-0.082	0.363	0.391	-0.198	1.000

Panel A2: Switch Firms

	r_{RIV}	r_{OJN}	Rex	Beta	Vola	DM	No.	ln_size	BM	RP_Lag	Time	IAS/IFRS	US-GAAP
r_{RIV}	1.000	0.630	-0.257	-0.008	0.156	0.004	-0.354	-0.496	0.653	0.584	0.398	0.147	0.181
r_{OJN}	0.567	1.000	-0.027	0.044	0.117	0.070	-0.209	-0.335	0.365	0.316	0.221	0.045	0.119
Rex	-0.258	-0.016	1.000	0.124	-0.226	0.031	0.273	0.008	-0.065	-0.469	-0.718	-0.229	-0.207
Beta	-0.048	0.062	0.137	1.000	0.201	0.000	0.279	0.065	0.008	-0.093	-0.216	-0.172	0.025
Vola	0.083	0.068	-0.233	0.112	1.000	0.129	-0.112	-0.054	0.089	0.208	0.266	0.096	0.086
DM	0.079	0.198	0.069	0.143	0.027	1.000	-0.003	0.115	0.255	-0.235	0.000	0.093	-0.132
No.	-0.301	-0.106	0.273	0.359	-0.107	0.047	1.000	0.678	-0.219	-0.343	-0.340	-0.074	-0.047
ln_size	-0.410	-0.264	-0.010	0.136	0.011	0.043	0.657	1.000	-0.372	-0.244	-0.011	0.080	0.103
BM	0.615	0.429	0.031	-0.013	-0.015	0.523	-0.118	-0.288	1.000	0.199	0.154	0.109	-0.012
RP_Lag	0.601	0.280	-0.488	-0.152	0.222	-0.242	-0.345	-0.232	0.142	1.000	0.696	0.223	0.324
Time	0.392	0.179	-0.697	-0.273	0.265	-0.022	-0.354	0.008	0.086	0.708	1.000	0.411	0.378
IAS/IFRS	0.151	0.035	-0.222	-0.189	0.083	0.028	-0.084	0.094	0.046	0.239	0.418	1.000	-0.217
US-GAAP	0.182	0.071	-0.223	-0.016	0.092	-0.172	-0.038	0.103	0.010	0.312	0.391	-0.217	1.000

This table shows parametric Pearson correlations (upper right triangle) and non-parametric Spearman correlations (lower left triangle) for two expected cost of equity capital estimates and eleven independent variables: r_{RIV} are the expected cost of equity capital estimated under the residual income valuation model assuming long-term growth; r_{OJN} are the expected cost of equity capital estimated under the Ohlson/Jüttner-Nauroth (2001) model assuming long-term growth. Rex is the proxy for the risk-free rate of return measured by the REX-Index return (*Datastream*); Beta is the five year rolling over beta against the CDAX-Market Index using monthly returns (*Datastream*); Vola is the standard deviation of the previous years daily returns, measured over 250 trading days (*Datastream*); DM is the ratio of long-term debt to market capitalization (*Worldscope*, *Datastream*); No. is the number of analyst following (*I/B/E/S*); Ln_size is the natural log of firm size in millions € (*I/B/E/S*); BM is the book to market ratio of equity (*Worldscope*, *I/B/E/S*); RP_Lag is the previous years risk premium of the firm's industry (Own calculation); Time is a monthly count variable ranging from January 1993 (=1) to December 2002 (=120); IAS/IFRS is a dummy variable, 1 if IAS/IFRS, 0 otherwise (Annual report); US-GAAP Dummy variable, 1 if US-GAAP, 0 otherwise (Annual report). The "All Firms" sample comprises all observations, the "Switch Firms" sample only observations of firms which have switched from local to international standards during the investigation period.

TABLE 7

Cross-Sectional Analysis of Risk Premium, Firm Characteristics and Financial Reporting

		A	Beta	ln_size	BM	Vola	No.	DM	RP_Lag	time	IAS/IFRS	US-GAAP	F-Stats	(Adj)-R2
Panel A: All Firms														
Hypothesis		O	+	-	+	+	-	+	+	o	-	-		
Panel A1: Pooled Cross-Sectional Regression														
(1a)	rp_{RIV}	0.0055	0.0096	-0.0079	0.0220				0.5117	0.0038	0.0036	0.0082	6140.96***	73.70%
		0.97	5.70***	-11.20***	13.48***				14.40***	8.87***	1.27	1.91*		
	rp_{OJN}	0.0206	0.0131	-0.0078	0.0156				0.0490	0.0054	0.0087	3.92	1346.65***	42.59%
		2.89***	5.25***	-9.43***	6.12***				0.99	9.12***	2.42**	1.10		
(2a)	rp_{RIV}	-0.0059	0.0137			0.0212	-0.0011	0.0018	0.8104	0.0014	0.0030	0.0019	2640.24***	58.31%
		-0.98	5.63***			2.60***	-10.12***	4.41***	16.02***	8.00***	0.69	0.37		
	rp_{OJN}	0.0096	0.0152			0.0134	-0.0009	0.0010	0.2945	0.0031	0.0037	-0.0004	644.23***	29.11%
		1.31	4.53***			1.43	-7.53***	4.03***	4.70***	4.52***	0.85	-0.08		
Panel A2: Standardized Monthly Cross-Sectional Regressions (Fama-McBeth 1973)														
(1b)	rp_{RIV}	0.0000	0.1097	-0.2507	0.4749				0.3424		0.0673	0.0404	46.17***	64.08%
		1.79	1.90*	-3.97***	8.13***				5.89***		1.15	0.69		
	rp_{OJN}	0.0000	0.1569	-0.2891	0.1899				0.1194		0.0665	0.0408	9.37***	26.15%
		3.78***	1.76*	-2.95***	2.25**				1.22		0.78	0.48		
(2b)	rp_{RIV}	0.0000	0.1071			0.0316	-0.2327	0.1966	0.5281		0.0301	0.0232	15.14***	40.28%
		0.57	1.33			0.34	-3.08***	2.82***	7.15***		0.36	0.24		
	rp_{OJN}	0.0000	0.1541			0.0245	-0.2365	0.1140	0.2396		0.0395	0.0178	4.37***	16.08%
		3.23***	1.54			0.22	-2.43**	1.21	2.45**		0.42	0.15		

Panel B: Switch Firms

		A	Beta	ln_size	BM	Vola	No.	DM	RP_Lag	time	IAS/IFRS	US-GAAP	F-Stats	Adj-R^2
Hypothesis		O	+	-	+	+	-	+	+	o	-	-		
Panel B1: Pooled Cross-Sectional Regression														
(1c)	rp_{RIV}	0.0006	0.0065	-0.0048	0.0341				0.4658	0.0023	0.0020	0.0064	1504.01***	68.74%
		0.05	1.42	-4.44***	9.58***				8.44***	3.19***	0.55	1.19		
	rp_{OJN}	0.0200	0.0156	-0.0052	0.0275				0.1152	0.0033	0.0054	0.0047	378.11***	37.29%
		1.46	2.38**	-4.05***	4.42***				1.52	3.61***	1.32	0.76		
(2c)	rp_{RIV}	0.0118	0.0080			0.0062	-0.0007	0.0003	0.6454	0.0009	0.0005	0.0016	571.72***	49.67%
		1.12	1.33			0.40	-4.21***	1.15	6.80***	1.16	0.11	0.26		
	rp_{OJN}	0.0258	0.0120			0.0056	-0.0006	0.0007	0.3683	0.0013	0.0018	0.0014	172.78***	24.26%
		1.84*	1.55			0.32	-2.70***	3.06***	3.28***	1.18	0.45	0.20		
Panel B2: Standardized Monthly Cross-Sectional Regressions (Fama-McBeth 1973)														
(1d)	rp_{RIV}	0.0000	0.0876	-0.1770	0.4956				0.4113		0.0799	0.0402	17.30***	62.17%
		0.65	0.84	-1.83*	4.92***				3.64***		0.80	0.43		
	rp_{OJN}	0.0000	0.1981	-0.1678	0.1726				0.1677		0.0559	0.0153	3.89***	24.28%
		1.56	1.35	-1.24	1.16				0.98		0.38	0.11		
(2d)	rp_{RIV}	0.0000	0.0908			0.0523	-0.1668	0.0883	0.5181		0.0490	-0.0088	5.26***	36.18%
		0.76	0.54			0.36	-1.33	0.70	3.60***		0.35	-0.10		
	rp_{OJN}	0.0000	0.1407			0.0079	-0.0765	0.1455	0.2825		0.0284	-0.0130	2.61***	18.47%
		1.52	0.79			0.04	-0.71	0.85	1.66*		0.15	-0.12		

***, **, * Significantly different from zero at significance levels of 1%, 5%, and 10%. This table shows regression results for a sample of German firms from 1993-2002 using data from *I/B/E/S*, *Datastream*, *Worldscope* and the annual reports. The dependent variables are the expected risk premia estimated under the residual income valuation model (r_{RIV}) or the Ohlson/Jüttner-Nauroth (2001) model (r_{OJN}) assuming long-term growth. The independent variables are the following: Rex is the proxy for the risk-free rate of return measured by the REX-Index return (*Datastream*); Beta is the five year rolling over beta against the CDAX-Market Index using monthly returns (*Datastream*); Vola is the standard deviation of the previous years daily returns, measured over 250 trading days (*Datastream*); DM is the ratio of long-term debt to market capitalization (*Worldscope*, *Datastream*); No. is the number of analyst following (*I/B/E/S*); Ln_size is the natural log of firm size in millions € (*I/B/E/S*); BM is the book to market ratio of equity (*Worldscope*, *I/B/E/S*); RP_Lag is the previous years risk premium of the firm's industry (Own calculation); Time is a monthly count variable ranging from January 1993 (=1) to December 2002 (=120); IAS/IFRS is a dummy variable, 1 if IAS/IFRS, 0 otherwise (Annual report); US-GAAP Dummy variable, 1 if US-GAAP, 0 otherwise (Annual report). All regression variables are winzorized to the 1st and 99th percentile values. The "All Firms" sample in Panel A comprises all observations, the "Switch Firms" sample in Panel B only observations of firms which have switched from local to international standards during the investigation period.

TABLE 8

Time-Series Analysis of Expected Risk Premia Before and After the Switch to International Financial Reporting

			Absolute Risk Premium				**Relative Risk Premium**			
	N		Mean		Median		Mean		Median	
	rp_{RI}	rp_{OJN}	rp_{RIV}	rp_{OJN}	rp_{RIV}	rp_{OJN}	rrp_{RIV}	rrp_{OJN}	rrp_{RIV}	rrp_{OJN}
Panel A: HGB to IAS/IFRS										
t – 1	49	49	4.22 %	5.48 %	3.78 %	5.29 %	-2.40 %	-1.38 %	-2.64 %	-1.71 %
t + 1	49	49	5.45 %	6.49 %	4.91 %	4.98 %	-2.26 %	-1.05 %	-2.99 %	-1.23 %
Diff. Δ			1.23 %	1.01 %	1.13 %	-0.31 %	0.13 %	0.33 %	-0.35 %	0.48 %
t-statistic			3.23 ***	2.76 ***			0.41	0.94		
z-statistic					1.55	-0.62			0.27	0.05
t – 2	37	36	2.99 %	4.78 %	2.71 %	4.72 %	-2.14 %	-1.16 %	-2.70 %	-1.50 %
t + 2	37	36	5.44 %	6.76 %	4.03 %	5.06 %	-2.61 %	-0.95 %	-3.39 %	-1.82 %
Diff. Δ			2.44 %	2.05 %	1.32 %	0.34 %	-0.47 %	0.21 %	-0.69 %	-0.32 %
t-statistic			4.86 ***	3.71 ***			-1.15	0.43		
z-statistic					-2.20 **	-1.33			1.00	0.50
t – 3	23	23	2.16 %	4.25 %	1.96 %	4.85 %	-1.79 %	-1.06 %	-2.53 %	-0.82 %
t + 3	23	23	4.43 %	6.06 %	3.93 %	5.02 %	-3.25 %	-1.50 %	-4.35 %	-1.94 %
Diff. Δ			2.27 %	1.81 %	1.97 %	0.17 %	-1.46 %	-0.44 %	-1.82 %	-1.12 %
t-statistic			5.53 ***	3.24 ***			-3.88 ***	-0.92		
z-statistic					-2.95 ***	-1.12			1.66	1.44
Panel B: HGB to US-GAAP										
t – 1	21	21	5.79 %	6.65 %	5.49 %	6.76 %	-0.79 %	-0.05 %	-1.34 %	0.13 %
t + 1	21	21	6.57 %	7.65 %	6.07 %	6.60 %	-1.44 %	-0.06 %	-1.59 %	-1.12 %
Diff. Δ			0.78 %	0.49 %	0.58 %	-0.16 %	-0.65 %	-0.60 %	-0.25 %	-1.25 %
t-statistic			0.88	0.42			-0.76	-0.53		
z-statistic					1.77 *	1.00			-0.06	-0.37
t – 2	21	21	5.01 %	5.86 %	5.08 %	5.97 %	-0.92 %	-0.48 %	-0.99 %	-0.35 %
t + 2	21	21	6.67 %	7.84 %	7.06 %	7.85 %	-2.39 %	-0.64 %	-2.14 %	-0.45 %
Diff. Δ			1.66 %	1.99 %	1.98 %	1.88 %	-1.47 %	-0.16 %	-1.15 %	-0.10 %
t-statistic			2.32 **	2.14 **			-2.19 **	-0.19		
z-statistic					2.54 **	2.02 **			-0.85	-0.23
t – 3	17	17	3.12 %	4.82 %	2.10 %	5.13 %	-1.59 %	-0.88 %	-0.76 %	-0.75 %
t + 3Diff. Δ	17	17	6.80 %	7.53 %	7.29 %	6.81 %	-2.30 %	-1.01 %	-2.39 %	-0.65 %
			3.68 %	2.71 %	5.19 %	1.68 %	-0.71 %	-0.13 %	-1.63 %	0.10 %
t-statistic			5.06 ***	3.38 ***			-0.95	-0.18		
z-statistic					2.91 ***	1.67 *			-1.62	-1.05

***, **, * Significantly different from zero at significance levels of 1%, 5%, and 10%. A t-test of paired differences rejects the hypothesis of no difference from zero (two-tailed). A Wilcoxon rank sum test rejects the hypothesis of no difference in the distributions (two-tailed). The results are for a sample of German firms from 1993-2002 which switched their reporting standards from local GAAP (HGB) to IAS/IFRS (Panel A) or US-GAAP (Panel B). Data is from *I/B/E/S*, *Datastream* and *Worldscope*. Information on the accounting standards applied comes from the auditor's statement of the annual reports. rp_{RIV} is the risk premium estimated under the residual income valuation model, rp_{OJN} is the risk premium estimated under the Ohlson/Jüttner-Nauroth (2001) model. To calculate the relative risk premium rrp_{RIV} (rp_{OJN}), the average risk premium of all sample firms at each estimation month is deducted as proxy for the market risk premium from each firm's risk premium estimate rp_{RIV} (rp_{OJN}). The period t+/-1 (+/-2, 3) marks plus/minus one (two, three) years from the month of the first published annual financial report according to IAS/IFRS or US-GAAP standards.

TABLE 9

Simultaneous Estimation of Expected Cost of Equity Capital and Long-Term Growth Rates for Switch-Firms

Panel A: Switch Sample (n=54)

	RIV (ETSS 2002)				OJN (Easton 2004)			
	Local GAAP (Pre)		International GAAP (Post)		Local GAAP (Pre)		International GAAP (Post)	
Regression Coefficents	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic	Coefficient	t-statistic
Intercept	0.2839	4.47***	0.3941	5.43***	0.0091	3.41***	0.0094	1.88*
Independent Variable	0.1574	7.20***	0.1702	6.71**	0.9990	20.92***	1.1430	15.83***
N		49		51		49		50
Adjusted R^2		52.54%		47.85%		90.30%		83.92%
Cost of equity capital (r)		9.57%		11.84%		9.51%		19.20%
Long-term growth rate (g, Δagr)		6.45%		8.66%		-0.10%		14.30%

Panel B: Bootstrapped Switch Sample (n=54, 1000 iterations)

RIV (ETSS 2002)

	Cost of equity capital (r_{RIV})				Long-term Growth (g)			
	r_{pre}	r_{post}	t-stats	Z-stats	g_{pre}	g_{post}	t-stats	Z-stats
Mean	9.55%	11.80%	54.96***		6.44%	8.66%	35.51***	
Median	9.51%	11.72%		36.63***	6.42%	8.53%		28.64***
Std.	0.77%	1.04%			1.28%	1.52%		
Interquartile Range	1.07%	1.40%			1.84%	2.02%		
Range	4.81%	5.96%			8.07%	8.78%		

OJN (Easton 2004)

	Cost of equity capital (r_{OJN})				Long-term Growth (Δagr)			
	r_{pre}	r_{post}	t-stats	Z-stats	Δagr_{pre}	Δagr_{post}	t-stats	Z-stats
Mean	9.80%	20.70%	50.37***		0.12%	14.76%	36.63***	
Median	9.60%	19.34%		37.66***	0.12%	14.42%		29.15***
Std.	1.33%	6.71%			4.80%	11.69%		
Interquartile Range	1.63%	8.86%			6.35%	16.19%		
Range	9.36%	40.60%			37.57%	80.82%		

Panel C: Bootstrapped Industrial Switch Sample; (n=39, 1000 iterations)

	1997		1998		1999		2000		2001	
	RIV	OJN	RIV	OJN	RIV	OJN	RIV	OJN	RIV	OJN
n_{HGB}	26	26	27	27	25	25	13	13	7	7
$n_{Int.}$	8	8	11	11	18	18	26	26	29	29
r_{HGB}	9.22%	11.57%	10.75%	12.75%	9.28%	12.41%	11.88%	41.49%	12.54%	11.65%
$r_{Int.}$	10.61%	8.43%	7.86%	17.82%	12.58%	11.64%	15.19%	17.43%	13.23%	22.92%
Δ r	1.39%***	-3.14%***	-2.89%***	5.07%***	3.30%***	-0.77%***	3.31%***	-24.06%***	0.69%***	11.27%***
$g(\Delta agr)_{HGB}$	6.42%	2.52%	7.26%	7.26%	6.58%	3.64%	9.38%	42.03%	5.35%	-0.45%
$g(\Delta agr)_{Int.}$	8.57%	0.99%	0.12%	0.16%	11.83%	5.23%	14.23%	13.64%	10.16%	16.72%
Δ (g;Δagr)	2.15%***	-1.53%***	-7.14%***	-7.10%***	5.25%***	1.59%***	4.85%***	-28.39%***	4.81%***	17.17%***

***, **, * Significantly different from zero at significance levels of 1%, 5%, and 10%. A t-test as in Efron/Tibshirani (1993), p. 224 rejects the hypothesis of no difference from zero (two-tailed p-value) and A Wilcoxon rank sum test rejects the hypothesis of no difference in the distributions (two-tailed p-value). Results are based on a sample of 54 German firms which switch from local (HGB) to international reporting standards (IAS/IFRS or US-GAAP) between 1993-2002 utilizing data from *I/B/E/S*, *Datastream*, *Worldscope*, and the annual reports. The sample firms are also the basis for the bootstrapped sample (1000 iterations) in Panel B. In panel C, only industrial firms (SIC codes 20-39) which switched enter the analysis. r_{RIV} are the expected cost of equity capital estimated simultaneously with the long-term growth rate of earnings (g) under the residual income valuation model (RIV) as in Easton/Taylor/Shroff/Sougiannis (ETSS 2002). r_{OJN} are the expected cost of equity capital estimated simultaneously with long-term change in abnormal growth in earnings (Δagr) under the Ohlson/Jüttner-Nauroth (2001) model (OJN) as in Easton (2004).

FIGURE 1

Distribution of Expected Cost of Equity Capital and Long-Term Growth Rates using Bootstrapping for the Switch Companies

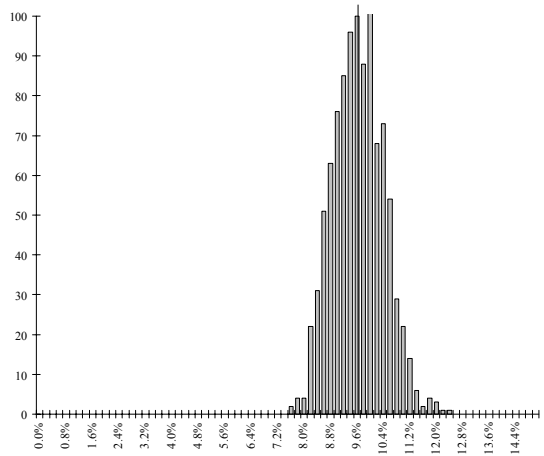
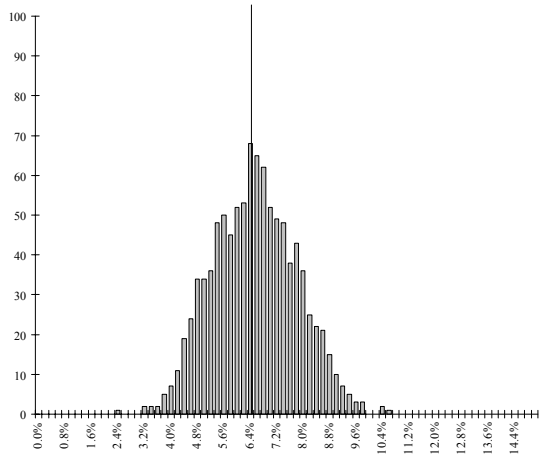
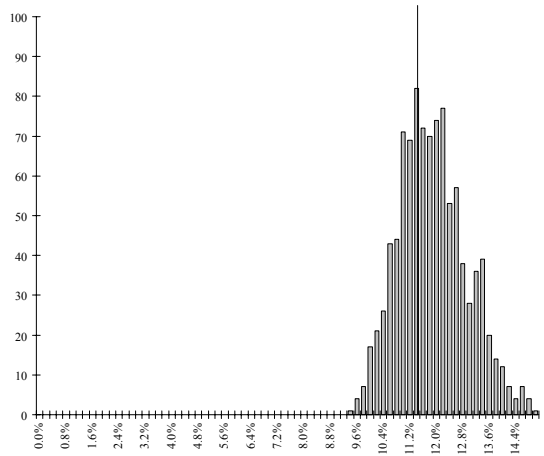
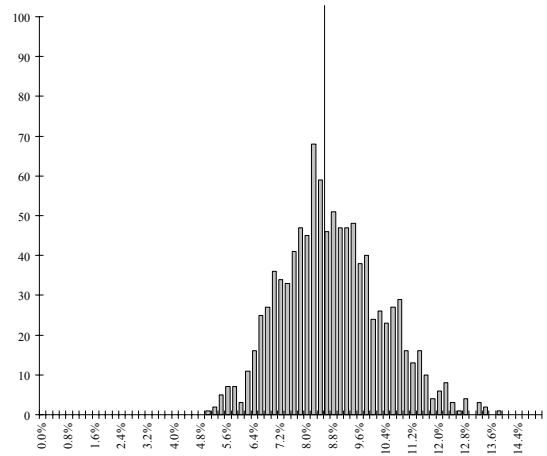
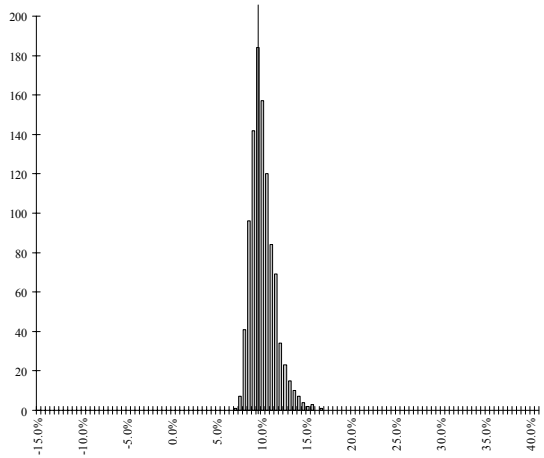
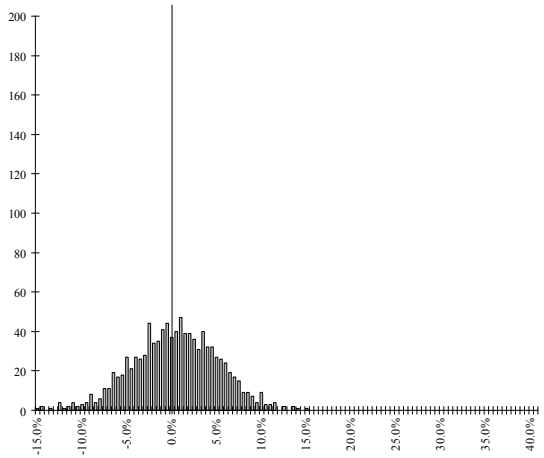
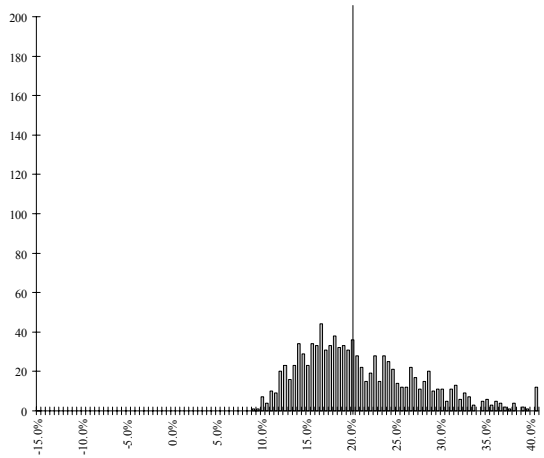
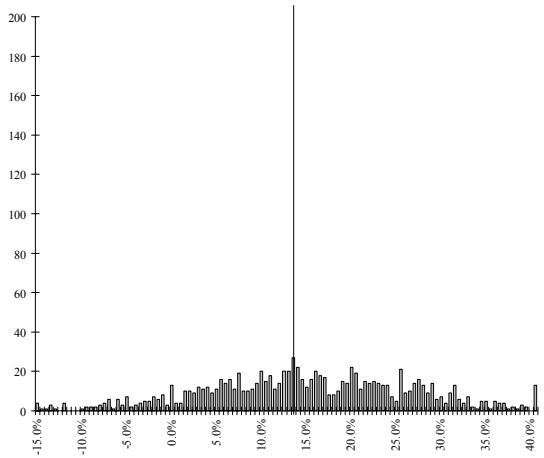
RIV (ETSS 2002)	
Cost of equity capital (r_{RIV})	Long-term growth rate (g)
Panel A1: Local GAAP (HGB) pre switch	
	
Panel A2: International GAAP (IAS/IFRS and US-GAAP) post switch	
	

FIGURE 1 (cont.)

Distribution of Expected Cost of Equity Capital and Long-Term Growth Rates using Bootstrapping for the Switch Companies

OJN (Easton 2004)	
Cost of equity capital (r_{OJN})	Long-term growth rate (Δagr)
Panel B1: Local GAAP (HGB) pre switch	
	
Panel B2: International GAAP (IAS/IFRS and US-GAAP) post switch	
	

This figure displays the distributions expected cost of equity capital and long-term growth rates of earnings estimated simultaneously in a regression framework using 1000 randomly drawn samples under bootstrapping initially 54 observations. These are from 54 German firms which switch between 1993-2002 from local (HGB) to international reporting standards (IAS/IFRS or US-GAAP). Data is from *I/B/E/S*, *Datastream*, *Worldscope*, and the annual reports. Pre-switch marks the time before the adoption of international standards, post-switch the time after the adoption of international standards. r_{RIV} are the expected cost of equity capital estimated simultaneously with the long-term growth rate of earnings (g) under the residual income valuation model (RIV) as in Easton/Taylor/Shroff/Sougiannis (ETSS 2002). r_{OJN} are the expected cost of equity capital estimated simultaneously with long-term change in abnormal growth in earnings (Δagr) under the Ohlson/Jüttner-Nauroth (2001) model (OJN) as in Easton (2004).

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Kontaktadresse für Bestellungen:

Professor Dr. Reinhard H. Schmidt
Wilhelm Merton Professur für
Internationales Bank- und Finanzwesen
Mertonstr. 17
Postfach 11 19 32 / HPF66
D-60054 Frankfurt/Main

Tel.: +49-69-798-28269
Fax: +49-69-798-28272

e-mail: merton@wiwi.uni-frankfurt.de

http://www.finance.uni-frankfurt.de

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