Mandatory Adoption of IFRS and Cost of Capital: Does country classification matter? Evidence from developed versus developing countries

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Abstract

This study examines the economic consequences of mandatory adoption of International Financial Reporting Standards (IFRS) from firm level perspective, and across country classification (developing versus developed economy). Using a global sample of firms from 40 / 45 countries spanning over two decades from 1993-2016, and applying difference-in-differences design, we analyze the induced changes in the cost of equity / debt capital following IFRS adoption. We find that mandatory adopters in developing countries are not more likely to experience significant decreases in the cost of equity in the post-adoption period than firms in developed countries. Even more important, in neither country group mandatory adopters show an advantage over non-adopters from our control group, meaning that IFRS adoption does not have a positive effect on cost of equity capital. However, for cost of debt we identify an advantage of mandatory adopters over non-adopters in developing as well as in developed countries. At the same time, firms in developed countries show a larger decrease in the cost of debt than firms in developing countries. Furthermore, as an additional analysis we examine the impact of IFRS adoption on cost of equity under consideration of a country's institutional settings and its shareholder protection regime. In line with prior literature we find that IFRS adoption seems more beneficial when a country exhibits high governance quality, which accounts for both country groups. However, regarding shareholder protection our findings are twofold. In developed countries IFRS adoption seems most beneficial to firms which are located in strong shareholder protection regimes, whereas in developing countries the opposite is the case. Overall, our findings suggest that mandatory IFRS adoption does not necessarily come along with economic benefits and should be considered when promoting the worldwide introduction of IFRS, especially in developing countries.

Key Words: IFRS adoption, Cost of Equity, Cost of Debt, Developing/Developed Country

1. Introduction

Standard setters and regulators often argue that the potential benefits associated with the adoption of IFRS outweigh the costs resulting from the introduction of this accounting framework. A lower cost of capital is claimed to be one of the main benefits for companies applying IFRS (IFRS Foundation, 2017). The reasoning behind this is that a common set of high-quality accounting standards enhances financial reporting quality and decreases information asymmetries between companies and investors, which in turn reduces information risk, and ultimately a reduction in cost of capital (Li, 2010). Prior research has investigated the question of whether the mandatory adoption of IFRS can reduce the cost of equity capital. These studies have yielded mixed results. For instance, Daske et al. (2008) observed a decrease in firms cost of equity capital, but only prior to the mandatory adoption date. Furthermore, they suggest that this effect occurs mainly in countries which have established a sophisticated enforcement regime and where companies have strong reporting incentives. Li (2010) arrives at a similar conclusion. While she finds a significant reduction in the cost of equity after mandatory adoption of IFRS in the European Union, she also emphasizes that this effect is only observable in countries with strong legal enforcement. In other words, a firm in a country with strong institutions is much more likely to benefit from lower cost of capital than a firm in a country with weak enforcement.

However, these studies mainly focused on developed economies, and as such, a residual question is, to what extent the findings of prior literature hold for developing countries which by their nature are characterized by weak enforcement institutions. Generally, developing economies often have weak institutional settings and lack strong enforcement regimes (Lin, 2012). Following Li's results, this implies that the mandatory adoption of IFRS cannot lower a firm's cost of capital in a developing country. Moreover, according to this argumentation firms in developed countries should show a decrease in the cost of capital, given the fact that developed economies usually exhibit strong institutional settings. By contrast, Bova and Pereira (2012) provide arguments for an opposing view. They find evidence that the information environment of firms can increase through IFRS adoption even in low enforcement countries, and accordingly, positive economic effects for these firms cannot be ruled out. If this was the case, then the (potential) change in the cost of capital should not vary across country classification. Taking the two opposing views into account, the underlying research question of our study is whether mandatory adoption of IFRS similar economic consequences for has

developing countries as compared to developed countries. In contrast to previous studies, however, we do not limit our research to cost of equity only. Instead, we also examine the development of the cost of debt capital after IFRS adoption in order to cover both components of cost of capital. This allows a thorough examination of the economic consequences of IFRS adoption on firm level. We focus on the cost of capital since this variable reflects investors' assessment of information risk and has practical relevance for firms.

We measure the cost of equity by applying four different accounting-based valuation models, two abnormal earnings growth models and two residual income valuation models, respectively. Following prior research, we average the estimates of these models. For the cost of debt we use a simplified approach by dividing annual interest expense by total long-term debt. The application of difference-in-differences designs enables us to isolate the impact of IFRS adoption on cost of capital. We not only regress the estimated cost of equity / debt on the independent variable (IFRS adoption), but also on a set of control variables to control for other factors that might have driven changes in the cost of capital in the post-adoption period. These control variables take into account country-specific risk-free interest rates, firm size, financial leverage as well as industry and country fixed effects. In order to investigate the importance of institutional settings, we run an additional analysis for cost of equity including control variables that control for country specific institutional factors, namely the Corruption Perceptions Index developed by Transparency International, the Worldwide Governance Indicators, and the World Bank's strength of minority investors protection index. The classification of our sample economies as either developing or developed is based on the assessment of the IMF. All other relevant data was obtained from Compustat (financial statement data), I/B/E/S (analyst consensus earnings forecasts), Global Financial Data, and from the World Bank database (both macroeconomic data).

For the cost of capital we find strong evidence that mandatory IFRS adoption can, but does not necessarily have to be beneficial to firms in developing as well as in developed countries in terms of cost of capital. At the same time, we find support that a country's governance quality determines whether a firm benefits from IFRS adoption. Regardless of economic development status, the outcome for firms in good governance countries is better in relation to firms in bad governance countries, which confirms the findings of prior literature (Daske et al. (2008); Li (2010)).

To the best of our knowledge there has not been a study that analyzes the effects of mandatory IFRS adoption on both components of the cost of capital, cost of equity and cost of debt, for a broad sample of developing countries and that relates the results to developed countries, and under the inclusion of a set of non-adopting control countries. Moreover, we analyze a long-time horizon, covering the years 1993-2016, whereas prior literature often focused on shorter periods around the adoption date. Our study aims to fill these gaps of the literature. The findings could be of interest for regulators and firms not only in developing countries, but also in developed countries, especially in economies that are considering the adoption of IFRS.

The rest of the paper is structured as follows: the next section provides an overview of prior literature and introduces our hypotheses. In section 3 we discuss our research design, the sample selection procedure, and descriptive statistics. Thereafter, section 4 reports the empirical results per hypothesis, followed by a summary of robustness tests. Section 5 concludes with a summary of findings, their implications and some hints for future research.

2. Literature review and hypotheses development

2.1 Literature review

With its IFRS standards the IASB aims for transparency, accountability and efficiency in financial markets around the world (IFRS Foundation, 2017). As over the last 15 years more and more countries have adopted IFRS, previous literature has analyzed the extent to which the IASB has been successful in achieving those objectives, and how firms as well as investors have benefited. Financial accounting literature mainly focuses on the impact of IFRS on financial reporting quality (value relevance, conservatism and earnings management).

Enhanced accounting quality is considered a desired benefit associated with a common accounting language. Barth et al. (2008) conducted one of the earliest IFRS related studies in this field. They compared firms across countries in terms of accounting quality and distinguished between voluntary IFRS adopters and non-adopters. Their results not only prove to have higher accounting quality in the post-adoption period as compared to the pre-adoption period, but they also tend to have higher accounting quality than non-adopting firms. Their study furthermore emphasizes that the observed effects may partly be attributable to increased reporting incentives and changes in the economic environment. For example, a company looking for a new source of financing (e.g. IPO) has an incentive to improve its accounting quality. Taking these results into account, Christensen et al. (2015) conducted a similar study, but they additionally make a distinction between voluntary and mandatory adopters. Their sample solely comprises German companies in the years from 1998 to 2011. According to their results, voluntary adopters exhibit enhanced accounting quality in the post-adoption period, while mandatory adopters show little or no improvement. Hence, IFRS do not automatically lead to higher accounting quality. This is in line with Soderstrom's and Sun's (2007) argumentation. Despite European Union (EU) wide mandatory adoption of IFRS, they predict that cross-country differences in accounting quality are likely to remain because of differences in the country specific institutional settings in which firms operate. Ball (2006) makes a similar statement. Although he sees the advantages of uniformity in accounting rules, he expresses concerns that accounting standards are not the only determinants of accounting quality. Instead, it is highly influenced by local economic and political forces as there are "national differences in financial reporting practice". Meaning that each country decides how strictly it monitors compliance with applicable accounting laws. Thus, high quality accounting standards are a

necessary but not sufficient condition to achieve high accounting quality (Florou and Pope, 2012).

Apart from accounting quality, financial reporting quality also depends on disclosure quality. Previous literature found a positive relation between IFRS adoption and disclosure quality. Lang and Stice-Lawrence (2015) gather a dataset of more than 87,000 annual reports of firms from 42 countries over the period 1998 to 2011 and examine changes in the quality of financial statement disclosure by using textual analysis. Their analysis reveals that, under IFRS, firms disclose more information, use less boilerplate language and are more comparable among each other. In total, this suggests an improvement of disclosure quality under IFRS.

Generally, the above-mentioned findings indicate that the adoption of IFRS, depending on country and firm, can have positive consequences for financial reporting quality. Since financial reporting quality in turn plays an important role in information asymmetry and estimation risk, (De George et al., 2016), it can be inferred that the adoption of IFRS has a positive economic impact. Standard setters and regulators emphasize that high quality accounting standards, such as IFRS can lower a firm's cost of capital (Levitt, 1998; Tweedie, 2006; IFRS Foundation, 2017). The theoretical connection behind this can be explained through a closer look at information asymmetry and estimation risk. "Estimation risk refers to the uncertainty associated with investors' assessments of the parameters of an asset's return or payoff distribution" (De George et al., 2016), and information asymmetry relates to the fact that managers may have more information about a firm's financial position than an investor. Information asymmetry can also arise between two trading investors who have different levels of knowledge about a firm (De George et al., 2016). However, by disclosing IFRS compliant accounting information companies can reduce estimation risk as well as information asymmetry because it enhances comparability of firms and enables investors to assess risks better (Li, 2010).

Florou and Kosi (2015) find that mandatory IFRS adoption has positive effects on the cost of public debt. Based on bond yield spreads they examine the economic consequences for firms from 35 countries, including firms from EU- and non-EU countries. For the cost of private debt, on the other hand, empirical studies show that mandatory IFRS adoption does not seem to have a positive impact (Florou and Kosi, 2015; Chen et al., 2015).

Daske et al. (2008) analyze the effects of mandatory IFRS adoption on market liquidity, cost of equity capital and Tobin's q by using a sample of firms across 26 countries. They estimate the implied cost of equity by averaging the results of four different accounting-based valuation models, which are all based on analyst consensus earnings forecasts. The results reveal an increase in the cost of equity capital at the time of mandatory IFRS adoption. However, Daske et al. (2008) inferred that the stock market anticipated the changes in the accounting regime prior the official IFRS adoption date. Therefore, they extended their analysis and find a decrease in the cost of equity by 26 basis points when using the one year before adoption as an estimation window. Additionally, their cross-sectional analyses bring to light that this effect occurs only "in countries with relatively strict enforcement regimes and in countries where the institutional environment provides strong incentives to firms to be transparent" (Daske et al., 2008). Li (2010) arrives at a similar conclusion, although her results are different. She uses a difference-in-differences research design and analyses the effect of mandatory IFRS adoption on the cost of equity capital of 1,084 firms in the European Union. While she finds a significant reduction in the cost of capital of 47 basis points subsequent to the mandatory adoption date, she also emphasizes that this effect is only observable in countries with strong legal enforcement. Taken together, Daske's and Li's results indicate that the mandatory adoption of IFRS must come along with strong enforcement regimes or reporting incentives in order to be beneficial to companies concerning their cost of capital. However, Daske and Li focus on developed countries in their analyses, which leads to the question if their findings also hold in the case of developing countries. In prior literature this question has been answered to some extent. Using a global sample from 34 countries Kim et al. (2014) evaluate the impact of voluntary IFRS adoption on a firm's implied cost of capital. Their sample also includes developing countries and they find that IFRS adoption does not only lead to a decrease in the cost of capital but that this effect is even greater when a country's institutional settings are weaker in comparison to other countries. While Kim et al. (2014) focused on voluntary adopters and cost of equity only, de Moura et al. (2020) analyze the effects of mandatory IFRS adoption on cost of equity and cost of debt in Latin American countries (Argentina, Brazil, Chile, Mexico, and Peru), which are considered developing countries. According to their findings firms benefitted from reduced cost of equity and cost of debt capital in the post-adoption period. Although the results of Kim et al. and de Moura et al. imply economic benefits for IFRS adopters, it is questionable whether this also holds true when analyzing a long-term horizon and with sole focus on mandatory adoption., and whether there are differences between developing as well developed countries.

This question has not been answered in prior literature. Therefore, the underlying research question of this study is whether the mandatory adoption of IFRS has similar economic consequences for developing countries as compared to developed countries.

The research question can be answered from two different perspectives. For one thing, there is the firm level perspective that has already been described above and which is subject to this study; for another there is the country / government level perspective. Literature only offers little insights into the latter. Hope et al. (2006) and Ramanna and Sletten (2014) investigate why countries adopt IFRS. Both papers conclude that the potential economic benefits from IFRS adoption leads countries and firms to adopt them. However, to our knowledge neither they nor other studies have examined the economic consequences (e.g. government cost of public debt) of IFRS adoption on country level.

2.2 Hypothesis development

Following the argumentation in prior literature and relating to the cost of equity capital, we hypothesize that firms in developing countries benefit less (or not at all) from mandatory IFRS adoption[1] than firms in developed countries. This is attributable to the following factors. First, developing economies often lack strong enforcement regimes (Lin, 2012). Thus, companies may have the opportunity to avoid full compliance with IFRS, even though law requires them to adopt them. Consequently, in comparison to local GAAP reporting, investors may still face high information risk, which they want to be compensated for through higher returns (Easley and O'Hara, 2004). Second, weak institutional settings may prevent investors from investing in developing countries. This includes, for example, the lack of investor protection mechanisms. Accordingly, Florou and Pope (2012) find evidence that mandatory IFRS adoption does not lead to an increase in institutional investor demand for equities in countries with weak institutional settings. Hence, a decrease in the cost of equity capital is unlikely to occur. Finally, "network effects" as described by Ramanna and Sletten (2014) may "force" a government of a developing country to adopt IFRS, even if local accounting standards are more superior, considering the institutional settings in a country. In this case, the cost of equity would probably not decrease or even increase if investors encounter higher information risk than under local accounting standards. Nevertheless, it is also possible that there is a positive effect

[1] For clarification purposes: By mandatory IFRS adoption we refer to the point in time when a country imposes the application of IFRS by law, even if this only accounts for certain firms (e.g. publicly listed). We left aside the different shades of mandatory adoption as discussed in Othman and Kossentini (2015).

on the cost of equity capital as the information environment of firms can increase even in low enforcement countries (Bova and Pereira, 2012). In order to reflect this uncertainty, we propose our first hypothesis in the null form:

> **H1a:** All things being equal, there is no difference in the effect of IFRS adoption on cost of equity capital between developed versus developing countries.

But cost of equity is only one component of cost of capital. Especially in developing countries, debt financing is just as or even more important, so our study also takes into account the cost of debt. On the one hand, we expect that mandatory IFRS adoption leads to comparable economic consequences in the debt market as in the equity market since investors in the public debt market and investors in the equity market face similar information asymmetries as they rely heavily on financial statements (Florou and Kosi, 2015). On the other hand, previous studies showed that positive effects can only be expected for the cost of public debt (Florou and Kosi, 2015; Chen et al., 2015). Thus, given the fact that every firm has different financing preferences (public vs. private debt) and based on the differences in institutional settings between developing and developed countries, the outcome is again uncertain. We test this relationship by proposing that:

> **H1b:** All things being equal, there is no difference in the effect of IFRS adoption on cost of debt capital between developed versus developing countries.

Given the fact that institutional settings vary significantly among countries and based on the arguments presented above for H1 we predict a relationship between governance quality and the effects of mandatory IFRS adoption on the cost of capital:

> **H2:** Mandatory IFRS adoption is most beneficial to firms in countries that exhibit good governance.

Apart from governance quality investors are also interested in countries' shareholder protection mechanisms prior to taking an investment decision (Florou and Pope, 2012). Generally, weak shareholder protection either stops investors from an investment or leads to higher risk premiums. Houqe et al. (2012) examine the interrelation between mandatory IFRS adoption, shareholder protection and earnings quality in 46 countries. They show that firms in high shareholder protection regimes are associated with higher earnings quality, an important factor when it comes to the cost of equity. Hence, we hypothesize that:

H3: Mandatory IFRS adoption is most beneficial to firms in countries that exhibit strong shareholder protection mechanisms.

3 Data and research methodology

In the following, we will first provide an overview of the methods that we use to estimate our dependent variables, cost of equity and cost of debt. After the description of the data collection methodology and sample selection procedures, we will present the regression models as well as descriptive statistics.

3.1 Measuring cost of equity

Our proxy for the cost of equity capital is the rate of return implicitly expected by investors. It can be derived from analyst earnings forecasts in combination with market share prices and historical financial statement data. Although there are several approaches of how to measure cost of capital, prior literature has proven that accounting-based valuation models provide much accurate estimates than traditional models, such as CAPM (Gebhardt et al., 2001; Hail and Leuz, 2006). However, each accounting-based valuation model comes along with advantages and disadvantages, and thus we follow prior literature by applying the four most common valuation models and averaging their estimates instead of relying on just one model (Daske, 2008; Hail and Leuz, 2006; Li, 2008). We use two residual income valuation models and two abnormal earnings growth models. The formulae of the four models are as follows (Daske, 2008; Li, 2008):

a) Gebhardt et al. (2001)

$$P_t = bvps_t + \sum_{\tau=1}^{T} \frac{ROE_{t+\tau} - r_{GLS} * bvps_{t+\tau-1}}{(1+r_{GLS})^{\tau}} + \frac{ROE_{t+T+1} - r_{GLS} * bvps_{t+T}}{r_{GLS}(1+r_{GLS})^{T}} \qquad (1)$$

where:

P_t = Stock price at year t;

$ROE_{t+\tau}$ = Expected future return on equity of year t+τ, estimated as $\frac{eps_t}{bvps_{t-1}}$ for the first three years where $eps_{t+\tau}$ reflects analyst consensus earnings per share; ROE subsequent to t+3 is determined by fading ROE of year three to the historic industry-specific ROE median over nine years and keeping it constant beyond year t+12

$bvps_t$ = Book value of equity per share at beginning of year t;

$bvps_{t+\tau}$ = Expected future book value of equity per share at beginning of year t+τ assuming clean surplus and a constant dividend payout ratio

r_{GLS} = Implied cost of equity capital under the model defined by Gebhardt et al. (2001).

The main assumption of this residual income valuation model is that the future ROE beyond the short-term horizon of three years gradually fades to the historic industry-specific median. According to Gebhardt et al. (2001) this approach reflects the fact that firms generally cannot generate a higher ROE than their peers in the long-run. Furthermore, the model assumes clean surplus, a constant dividend payout ratio and constant growth beyond year twelve. We estimate the industry-specific median using the 68 industries defined by the Global Industry Classification Standard (GICS). Additionally, we compute the dividend payout ratio as the historic three-year average for each firm based on actual dividend payments. Missing dividend payout ratios or ratios smaller (larger) than zero (one) are replaced by the country-year median ratio.

b) Claus and Thomas (2001)

$$P_t = bvps_t + \sum_{\tau=1}^{T} \frac{eps_{t+\tau} - r_{CT} * bvps_{t+\tau-1}}{(1+r_{CT})^{\tau}} + \frac{(eps_{t+T} - r_{CT} * bvps_{t+T-1})(1+g)}{(r_{CT}-g)(1+r_{CT})^{T}} \qquad (2)$$

where:

P_t = Stock price at year t;

$eps_{t+\tau}$ = Analyst consensus earnings per share of year t+τ;

$bvps_t$ = Book value of equity per share at beginning of year t;

$bvps_{t+\tau}$ = Expected future book value of equity per share at beginning of year t+τ assuming clean surplus and a constant dividend payout ratio;

r_{CT} = Implied cost of equity capital under the model defined by Claus and Thomas (2001);

g = Long-term growth rate; proxy is the country-specific one-year-ahead realized inflation rate.

As compared to Gebhardt's et al. (2001) residual income valuation model this model differs significantly in terms of the long-term growth rate. Instead of using a firm/industry-specific growth rate it assumes that all firms grow at the same rate in the long-run. Since I/B/E/S only provides analyst consensus earnings forecast for up to five years ahead, we follow Claus and Thomas (2001) and define year five as our terminal year. The model not only assumes a constant growth rate beyond year five, but also clean surplus and a constant dividend payout ratio. As a proxy for the long-term growth rate we use country-specific one-year-ahead realized inflation rates, obtained from the World Bank database. The dividend payout ratio is the same as under Gebhardt's et al. (2001) model.

c) Gode and Mohanram (2003)

$$r_{GM} = A + \sqrt{A^2 + \frac{eps_1}{P_0} * (g_{st} - g_{lt})} \qquad (3)$$

where:

r_{GM} = Implied cost of equity capital under the model defined by Gode and Mohanram (2003);

$A = \frac{1}{2} * \left(g_{lt} + \frac{div_1}{P_0}\right)$;

eps_1 = Analyst consensus next year's earnings per share;

P_0 = Stock price;

g_{st} = Short-term growth rate calculated as $\frac{eps_2 - eps_1}{eps_1}$;

g_{lt} = Long-term growth rate; proxy is the country-specific one-year-ahead realized inflation rate;

div_1 = Expected next year's dividend per share.

This is an abnormal earnings growth valuation model that takes into account short-term and long-term growth rates. On the one hand, it assumes that all firms grow at the same rate in the long-run. Like under b) our proxy for this rate is the country-specific one-year-ahead realized inflation rate. On the other hand, the short-term growth rate is a firm-specific value derived from the change in forecasted earnings between year one and year two. The expected dividend per share results from the earnings forecast in combination with the dividend payout ratio as already calculated for model a).

d) Easton (2004)

$$P_t = \frac{eps_2 + r_{MPEG} * div_1 - eps_1}{r_{MPEG}^2} \qquad (4)$$

where:

P_t = Stock price at year t;

eps_1 = Analyst consensus next year's earnings per share;

eps_2 = Analyst consensus earnings per share of year t+2;

div_1 = Analyst consensus next year's dividend per share;

r_{MPEG} = Implied cost of equity capital under the model defined by Easton (2004).

Easton's (2004) variation of an abnormal earnings growth valuation model assumes that abnormal earnings can persist perpetually. The expected dividend per share results from the earnings forecast in combination with the dividend payout ratio as already calculated for model a).

While the models a) and b) can deal with negative earnings forecasts, models c) and d) require positive earnings forecasts which negatively affects our sample size. On a positive note, the abnormal earnings growth models do not rely on a clean surplus assumption. The clean surplus relation holds when changes in the book value of equity only result from net income and equity related, value-neutral transactions with the owners of the firm, such as dividends (Easton, 2007). However, for many firms this is not the case, and then models c) and d) tend to outperform models a) and b) (Lee et al., 2008). One disadvantage that all models have in common is their implicit measuring bias. According to Easton (2007) analyst earnings forecasts are majorly optimistic, which in turn causes upward bias in the model estimates. Taking the average of estimates of different valuation models can mitigate this problem to some extent, but since all models are based on the same analyst forecasts an implicit error remains (Easton, 2007). Nonetheless, our study relies on this approach because our focus is not firm-specific observations, but differences between groups of firms instead. By forming groups (developing countries vs. developed countries, mandatory vs. voluntary adopters) and comparing the averages of these groups, the measurement error associated with firm-specific estimates basically becomes irrelevant under the assumption of a randomly distributed error (Easton, 2007).

3.2 Measuring cost of debt

As compared to the calculation of the implied cost of equity the calculation of cost of debt on firm level is relatively straightforward, when certain assumptions are being made. Our approach is to calculate annual pre-tax cost of debt by dividing annual interest expense by total long-term debt. This rather simplified calculation implies two assumptions. First, the sum of long-term debt at the end of the fiscal year is assumed to be a good proxy for the average amount of outstanding long-term debt during that year. This is one of the reasons why we do not include short-term debt as it is usually more volatile. Second, we assume that total interest expenses primarily result from interest charges on long-term debt. Especially the latter assumption is expected to cause some upward bias in our estimates since total interest expenses reported by Compustat also include interest payments on short-term debt. In spite of this

drawback, we believe that our approach delivers a good enough estimate for the purposes of our study, especially because we focus on trends over time rather than absolute values.

3.3 Sample selection

a) Cost of equity

Our paper focuses on the effects of mandatory IFRS adoption; therefore, our initial population comprises all countries that require listed firms to mandatorily adopt IFRS. Due to data availability reasons our cutoff year is 2016. On its website the IFRS Foundation provides detailed information about the IFRS adoption status per jurisdiction. By the end of 2016, 94 countries required listed companies to comply with IFRS (IFRS Foundation 2018). Since we examine the differences between developing and developed economies, we classify the identified economies as either developed or developing based on the classification in the "World economic outlook", a report issued by the IMF in October 2017 (IMF 2017). Overall, this approach results in 66 developing and 28 developed countries. Countries which adopted a modified version of IFRS (e.g. Australia, Philippines) are excluded from this study. We use Thomson One to identify active and inactive firms in each of the 94 economies. Based on the security identifiers Stock Exchange Daily Official List (SEDOL) or Committee on Uniform Security Identification Procedures (CUSIP) we extract financial statement data from Compustat in a time range from 1993 to 2016. Our starting year is 1993 because we aim to have an observation period of at least ten years prior to IFRS adoption; and among our sample countries the earliest adoption date was in 2002. In a next step, we retrieve analyst consensus earnings forecasts as well as stock price information from I/B/E/S for each firm, covering the period 1993-2017 if available. Per firm and year we include one observation in the sample. For instance, for a firm whose financial year ends on December 31st we only take into account the analyst consensus earnings forecast published in August after the financial year end. By leaving an eight-month gap between the end of the financial year and the analyst earnings forecasts, we ensure that the latest full year financial statements are reflected in the market share price (Lee et al., 2008). To measure the effects of mandatory IFRS adoption we also include several control countries. We select control countries that are comparable to our treatment group countries (IFRS adopters) in terms of macroeconomic and institutional factors. After merging the data from Compustat and I/B/E/S 57,078 firm-year observations remain.

To identify observations of mandatory IFRS adopters we first determine the first year of IFRS adoption for each firm. Compustat labels IFRS years with the code "DI" and non-IFRS years

with “DS”. Comparing the official adoption year of a country with the firm’s first IFRS year allows us to identify all mandatory adopters. Thus, if a firm applied IFRS as an early adopter it is not included in our sample. We also exclude firms that do not have observations for both the pre-mandatory and the post-mandatory adoption period available. However, we do not assume a minimum length of the observation period before and after IFRS adoption in order to be able to analyze a larger set of countries. Furthermore, we delete observations that lack financial statement data (e.g. total assets, net income). Although Li (2010) claims that she arrived at the same results regardless of whether or not she included financial services firms, we exclude companies from this industry to avoid distortions in our study caused by industry-specific accounting rules or regulation, such as Basel III. Since we require an implied cost of equity estimate for all four valuation models, we not only drop observations with a missing estimate, but also all observations that show negative earnings forecasts as our abnormal earnings growth models require positive earnings forecasts. Finally, we exclude observations that neither have earnings forecasts for *t*+3 nor long-term growth rate information available. Following these criteria our final sample consists of 45,801 firm-year observations, resulting from 5,176 distinct firms from 40 countries. Table 1 provides an overview of our sample selection procedures:

Table 1: Sample selection – Cost of equity capital

Merged firm-year observations from Compustat and I/B/E/S	150,297
./. Voluntary IFRS adopters or firms not applying IFRS in adopting countries	(17,795)
./. Missing financial statement data	(11,120)
./. Financial services firms	(12,504)
./. Neither earnings forecast for *t*+3 nor long-term growth rate available	(26,445)
./. Negative earnings forecasts	(19,646)
./. Firms that do not have observations for both the pre-mandatory and the post-mandatory adoption period available	(13,574)
./. Missing results for at least one valuation model	(3,422)
= Final sample size	45,801

b) Cost of debt

In general, our sample selection for cost of debt is majorly in line with the procedures under a). Differences arise from the fact that we can apply less rigid criteria, because technically we only require financial statement data on long-term debt and interest expense from Compustat for a firm-year observation to be included in our sample. Nevertheless, a firm must still have at least one observation for the pre-mandatory and the post-mandatory period available. In total

our final sample consists of 215,442 firm-year observations with 15,978 distinct firms from 45 countries. Table 2 summarizes the sample selection procedures:

Table 2: Sample selection – Cost of debt capital – Firm level

Firm-year observations from Compustat	503,215
./. Voluntary IFRS adopters or firms not applying IFRS in adopting countries	(84,381)
./. Missing financial statement data	(43,857)
./. Financial services firms	(78,027)
./. Firms that do not have observations for both the pre-mandatory and the post-mandatory adoption period available	(28,187)
./. Missing or negative cost of debt	(53,321)
= Final sample size	215,442

3.4 Regression models

In order to investigate our hypotheses, we require four different multivariate OLS regression models, which will be discussed in the following. They all have in common that we isolate the effect of IFRS adoption on our dependent variables by applying difference-in-differences designs.

In our initial regression, we regress the cost of equity and cost of debt estimates on the independent variable (IFRS adoption) and a set of control variables. We use firms form non-adopting countries as a control group. Hence, in a first step we introduce a dummy variable (IFRS) that equals one if a firm adopted IFRS mandatorily or zero in case of non-adoption. Additionally, a second dummy variable (POST) indicates whether a firm-year observation falls into the pre-adoption period or post-adoption period. All observations from the control group must be allocated to the pre-adoption or post-adoption period. Therefore, we define a fictitious adoption year based on the IFRS adoption year in a comparable economy. For example, in the case of the USA our adoption year is 2005 since this country is one of our reference countries for the European Union which adopted IFRS in 2005. As we distinguish between developing and developed countries, we add a third indicator variable (ECONOMY) equal to one if a firm is located in a developing country and zero otherwise. Furthermore, we include interaction terms between the mentioned dummy variables. To control for other factors that might have driven changes in the cost of equity (debt) capital we also include the following control variables:

- Interest rate (IR): This is a proxy for country-specific risk-free interest rates which are expected to have a high impact on the cost of equity (debt) capital as interest rates

fluctuate over time and usually vary significantly across countries (Hail and Leuz, 2006). Based on local short-term treasury bill yields, central bank reference rates or interbank rates we determine the country-year median interest rate (Li, 2010). we obtain the monthly interest rates from the Global Financial Data database.

- Firm size (SIZE): Generally, larger firms aim for higher transparency towards their investors, and therefore tend to have lower cost of equity (debt) than smaller firms. We measure size as the natural logarithm of total assets (Li, 2010) as obtained from Compustat and converted into USD with the year-specific exchange rates provided by the World Bank.

- Financial leverage (LEV): Higher financial leverage increases the chances but also the risks for investors. Therefore, we expect that financial leverage has a significant effect on the cost of equity (debt) capital. Financial leverage is defined as total liabilities divided by total assets (Daske, 2008; Li, 2010).

- Industry (IND): Dummy variables based on the 68 industries defined by the Global Industry Classification Standard (GICS) to control for industry fixed effects (Li, 2010).

- Country (COU): Dummy variables to control for country fixed effects (Li, 2010).

We winsorize all continuous variables at the 1st and 99th percentile to reduce distortions caused by outliers. Overall, our initial regression model is used to test H1a as well as H1b and can be summarized as follows, where COE/COD represents the mean of the cost of equity (debt) estimates:

$$(1) \quad COE/COD = \alpha_0 + \alpha_1 POST + \alpha_2 IFRS + \alpha_3 ECONOMY + \alpha_4 POST * IFRS + \alpha_5 POST * ECONOMY + \alpha_6 IFRS * ECONOMY + \alpha_7 IR + \alpha_8 SIZE + \alpha_9 LEV + \alpha_m IND + \alpha_n COU + \varepsilon$$

Since this initial regression does not allow us to test H2 and H3, we develop two additional regressions for cost of equity. Specifically, we investigate the importance of institutional settings by adding the following control variables that control for governance quality as well as shareholder protection mechanisms:

- Corruption Perceptions Index (CPI): An index that is published annually by Transparency International. It indicates the level of perceived corruption in a country,

with scores ranging from 0 (highly corrupt) to 100 (very clean) (Transparency International, 2018).

- Worldwide Governance Indicators (WGI): These indicators were developed as part of a World Bank-supported research project. They "summarize the views on the quality of governance provided by a large number of enterprises, citizen and expert survey respondents in industrial and developing countries" and measure six dimensions of governance (Kaufmann et al., 2008). we use three of these dimensions for our analysis: Government Effectiveness, Regulatory Quality and Rule of Law. Government Effectiveness and Regulatory Quality measure (among other things) the perceived ability of a government to implement policies and regulations effectively. Rule of Law deals with people's trust in executive authorities, thus it indirectly measures the perceived strength of policy enforcement. The WGI are shown on a scale from -2.5 (weak) to 2.5 (strong). Along with the CPI, the selected WGI will serve as proxies for governance quality in our study.

- Strength of minority investors protection index (SIPI): This variable is our proxy for shareholder protection mechanisms in a country. The index is one of the indicators included in the ease of doing business index that is published annually by the World Bank. SIPI is the aggregate of six subindices that measure "the protection of minority investors from conflicts of interest and shareholders' rights in corporate governance" (World Bank, 2018). Its methodology is partly based on a research conducted by Djankov et al. (2008) who developed an alternative to the anti-director rights index of La Porta et al. (1997, 1998), the anti-self-dealing index. The SIPI scores range from 0 (weak shareholder protection) to 10 (strong shareholder protection).

Of each index we use the latest available version (all updated in 2017) and assign the scores to our firm-year observations based on the country that the firm is located in. Per country group (developing vs. developed) we determine the median score of each index. If the country's CPI and all WGI scores are above (below) the peer group median, the dummy variable capturing governance quality (GOVERNANCE) is equal to one (zero). A second indicator variable (PROTECTION) serves to reflect the strength of shareholder protection mechanisms and equals one (zero) if the country's SIPI score is above (below) the peer group median. Lastly, we add interaction terms between certain dummy variables. This leads to the following models:

(2) $$COE = \alpha_0 + \alpha_1 POST + \alpha_2 IFRS + \alpha_3 ECONOMY + \alpha_4 GOVERNANCE + \alpha_5 POST * IFRS + \alpha_6 POST * ECONOMY + \alpha_7 IFRS * ECONOMY + \alpha_8 POST * GOVERNANCE + \alpha_9 IFRS * GOVERNANCE + \alpha_{10} ECONOMY * GOVERNANCE + \alpha_{11} POST*ECONOMY * GOVERNANCE + \alpha_{12} IR + \alpha_{13} SIZE + \alpha_{14} LEV + \alpha_m IND + \alpha_n COU + \varepsilon$$

(3) $$COE = \alpha_0 + \alpha_1 POST + \alpha_2 IFRS + \alpha_3 ECONOMY + \alpha_4 PROTECTION + \alpha_5 POST * IFRS + \alpha_6 POST * ECONOMY + \alpha_7 IFRS * ECONOMY + \alpha_8 POST * PROTECTION + \alpha_9 IFRS * PROTECTION + \alpha_{10} ECONOMY * PROTECTION + \alpha_{11} POST * ECONOMY * PROTECTION + \alpha_{12} IR + \alpha_{13} SIZE + \alpha_{14} LEV + \alpha_m IND + \alpha_n COU + \varepsilon$$

3.5 Descriptive statistics

a) Cost of equity

Table 3 provides descriptive statistics for all continuous variables of regression model (2) and (3) and covers the full period from 1993-2016. It suggests that firms in developing countries, on average, had about one percentage point higher cost of equity than firms in developed countries. Apart from cost of equity, also most other test variables vary significantly between developing and developed countries. Especially noticeable are total assets (expressed in million USD) and the governance indicators. On average, firms are three times larger in terms of total assets in developed countries. Due to the large spread between mean and median of total assets within each country group we use the natural logarithm of total assets for our regression (Li, 2010). The statistics on the governance indicators meet our expectations because developing countries exhibit much lower scores in all categories which proves that there are major differences in institutional settings.

Table 3: Descriptive statistics by country group – Cost of equity sample

	COE	**IR**	**SIZE**	**LEV**	**CPI**	**GE**	**RQ**	**RL**	**SIPI**
Developing countries									
Mean	0.119	4.11%	879	0.447	40.57	0.29	-0.21	-0.17	5.63
Median	0.104	3.01%	106	0.450	41.00	0.36	-0.26	-0.22	4.83
Std. Dev.	0.064	3.07%	4,177	0.203	3.05	0.19	0.22	0.17	1.24
Developed countries									
Mean	0.110	1.74%	7,275	0.519	74.65	1.62	1.53	1.57	6.47
Median	0.100	0.58%	401	0.525	75.00	1.48	1.50	1.67	6.47
Std. Dev.	0.046	2.07%	39,848	0.208	5.71	0.23	0.24	0.22	0.64

Table 3 reports descriptive statistics for the cost of equity sample, subdivided into developing and developed countries. GE (Government Effectiveness), RQ (Regulatory Quality) and RL (Rule of law) represent governance indicators. Please see 3.4 for more information and for the definitions of COE, IR, SIZE (before taking the natural logarithm), LEV, CPI and SIPI.

Table 4 gives more insights into the cost of equity on single country level, and how it developed after IFRS adoption. For information purposes table 4 also provides an overview of the selected non-IFRS adopters (control countries). The comparison of pre- and post-mandatory IFRS adoption period indicates that most countries had a statistically significant decrease in cost of equity. Taking into account all countries, the average cost of equity decreased from 0.111 in the pre-adoption period to 0.104 in the post-adoption period. To what extent this is an IFRS induced effect will be examined in section 4.1. Out of the mandatory adopters Mexico shows the largest decrease (-0.038) while Norway and the United Kingdom experienced the smallest decrease (both -0.001). Although Colombia and Greece are the countries with the largest increases (0.020 and 0.030), one must keep in mind that both countries had solely a small number of firm-year observations available. By far the most firm-year observations (1,722) are attributable to the United Kingdom, followed by France (1,125) and Canada (894). Argentina, Greece and Peru account for the least firm-year observations (all below 20).

Table 4: Implied cost of equity capital per country before and after IFRS adoption

			Pre-mandatory adoption		**Post-mandatory adoption**		
Country	**Economy**	**Year of mandatory adoption**	**N**	**Mean ICC**	**N**	**Mean ICC**	**Difference**
Argentina	Developing	2012	2	0.1572	4	0.1572	0.0000
Austria	Developed	2005	7	0.1123	20	0.1033	-0.0090
Belgium	Developed	2005	39	0.1274	117	0.1079	-0.0195***
Brazil	Developing	2010	192	0.1343	260	0.1314	-0.0029
Canada	Developed	2011	494	0.1127	400	0.1069	-0.0058**
Chile	Developing	2009	11	0.1241	40	0.0985	-0.0256*
China	Developing	2012	211	0.1122	500	0.0969	-0.0153***
Colombia	Developing	2015	30	0.1008	10	0.1210	0.0202
Denmark	Developed	2005	41	0.1148	89	0.1150	0.0002
Egypt	Developing	2003	4	0.1456	5	0.1399	-0.0057
Finland	Developed	2005	97	0.1228	287	0.1149	-0.0078*
France	Developed	2005	317	0.1084	808	0.1122	0.0038*
Germany	Developed	2005	73	0.1221	239	0.1108	-0.0113**
Greece	Developed	2005	5	0.1037	9	0.1338	0.0301
Hong Kong	Developed	2005	665	0.1323	897	0.1207	-0.0116***
India	Developing	2008	564	0.1304	1,165	0.1237	-0.0068***
Indonesia	Developing	2012	367	0.1392	168	0.1208	-0.0184***
Ireland	Developed	2005	24	0.1176	44	0.0914	-0.0262***
Israel	Developed	2008	10	0.1148	12	0.1197	0.0050
Italy	Developed	2005	15	0.1114	100	0.1142	0.0028
Japan	Developed	2005	2,943	0.0974	5,922	0.1020	0.0047***
Malaysia	Developing	2012	80	0.1255	49	0.1195	-0.0060

Mexico	Developing	2012	20	0.1260	13	0.0880	-0.0380***
Netherlands	Developed	2005	92	0.1137	181	0.1172	0.0034
Nigeria	Developing	2012	15	0.1487	34	0.1223	-0.0264***
Norway	Developed	2005	54	0.1250	132	0.1240	-0.0010
Peru	Developing	2012	1	0.1093	1	0.0837	-0.0256
Poland	Developing	2005	28	0.1332	59	0.1141	-0.0191**
Portugal	Developed	2005	14	0.1249	45	0.1088	-0.0162
Republic of Korea	Developed	2011	386	0.1345	465	0.1216	-0.0129***
Singapore	Developed	2005	251	0.1208	285	0.1162	-0.0046
Slovenia	Developed	2005	1	0.1395	19	0.1222	-0.0173
South Africa	Developing	2005	65	0.1438	116	0.1320	-0.0118***
Spain	Developed	2005	18	0.1148	78	0.1119	-0.0029
Sweden	Developed	2005	139	0.1212	285	0.1152	-0.0060*
Switzerland	Developed	2005	211	0.1122	500	0.0969	-0.0153***
Taiwan	Developed	2005	370	0.1182	683	0.1137	0.0044**
Thailand	Developing	2012	348	0.1267	213	0.1027	-0.0240***
United Kingdom	Developed	2005	644	0.1120	1,078	0.1115	-0.0005
USA	Developed	2005	6,556	0.1055	7,685	0.0977	-0.0078***
Total			19,170	0.1098	26,631	0.1038	-0.0060***

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 4 presents the countries in our sample (control countries are in italic), their economy status according to the IMF classification, the year of mandatory IFRS adoption, the implied cost of equity for the pre-mandatory as well as post-mandatory adoption period for each sample country, and the difference between both periods. The cost of capital was derived from the mean of the estimates resulting from four different valuation models (Gebhardt et al. (2001), Claus and Thomas et al. (2001), Gode and Mohanram (2003) and Easton (2006)). Based on the IFRS adoption years in comparable economies a fictitious adoption year was chosen for each control country.

b) Cost of debt

The descriptive statistics in table 5 show that firms in developing countries face higher cost of debt and are smaller in terms of total assets than their competitors from developed countries. The pre-tax cost of debt per country before and after IFRS adoption can be found in table 6, which also provides an overview of the selected non-IFRS adopters. For the vast majority of economies there was a significant decrease in cost of debt over time. Primarily, developing countries, such as Brazil and Turkey experienced the largest declines. As opposed to that, Argentina and Hungary had the largest rises.

Table 5: Descriptive statistics by country group – Cost of debt sample

	COD	**IR**	**SIZE**	**LEV**	**CPI**	**GE**	**RQ**	**RL**	**SIPI**
Developing countries									
Mean	0.310	6.25%	2,182	0.554	40.22	0.19	-0.20	-0.11	6.83
Median	0.172	5.94%	591	0.569	40.00	0.10	-0.31	-0.07	7.33
Std. Dev.	0.318	4.35%	7,070	0.180	4.05	0.20	0.27	0.20	1.35
Developed countries									
Mean	0.172	1.83%	5,002	0.555	72.94	1.61	1.50	1.49	6.56
Median	0.076	0.78%	400	0.563	75.00	1.61	1.49	1.61	6.47
Std. Dev.	0.252	2.19%	30,432	0.178	8.04	0.32	0.32	0.30	0.72

Table 5 reports descriptive statistics for the cost of debt sample, subdivided into developing and developed countries. GE (Government Effectiveness), RQ (Regulatory Quality) and RL (Rule of law) represent governance indicators. Please see 3.4 for more information and for the definitions of COD, IR, SIZE (before taking the natural logarithm), LEV, CPI and SIPI.

Table 6: Implied cost of debt capital per country before and after IFRS adoption

			Pre-mandatory adoption		Post-mandatory adoption		
Country	**Economy**	**Year of mandatory adoption**	**N**	**Mean ICC**	**N**	**Mean ICC**	**Difference**
Argentina	Developing	2012	360	0.3262	151	0.4402	0.1140***
Austria	Developed	2005	78	0.2010	63	0.1110	-0.0900**
Belgium	Developed	2005	295	0.1934	394	0.1372	-0.0563***
Brazil	Developing	2010	1,440	0.4094	1,035	0.2091	-0.2002***
Canada	Developed	2011	3,791	0.1465	2,267	0.1357	-0.0108*
Chile	Developing	2009	376	0.1386	316	0.0925	-0.0461***
China	Developing	2012	10,333	0.2950	8,072	0.2641	-0.0308***
Colombia	Developing	2015	302	0.2426	55	0.1471	-0.0955**
Czechia	Developed	2005	8	0.2451	10	0.1916	-0.0535
Denmark	Developed	2005	328	0.2053	465	0.1417	-0.0636***
Egypt	Developing	2003	33	0.1764	180	0.2293	0.0529
Estonia	Developed	2005	4	0.1630	12	0.1409	-0.0222
Finland	Developed	2005	448	0.1553	652	0.1232	-0.0321**
France	Developed	2005	1,838	0.1808	2,652	0.1296	-0.0512***
Germany	Developed	2005	838	0.2244	1,139	0.1898	-0.0345***
Greece	Developed	2005	347	0.2814	785	0.2131	-0.0684***
Hong Kong	Developed	2005	3,395	0.3038	5,420	0.2127	-0.0911***
Hungary	Developing	2005	11	0.5002	13	0.5758	0.0756
India	Developing	2008	17,343	0.2358	16,182	0.2902	0.0544***
Indonesia	Developing	2012	2,853	0.2909	1,372	0.2548	-0.0361***
Ireland	Developed	2005	107	0.1340	135	0.0784	-0.0556**
Israel	Developed	2008	212	0.1247	311	0.1914	0.0666***
Italy	Developed	2005	791	0.2338	1,330	0.1428	-0.0910***
Japan	Developed	2005	19,532	0.1195	23,250	0.0959	-0.0236***
Luxembourg	Developed	2005	22	0.1016	32	0.1136	0.0120
Malaysia	Developing	2012	58	0.2405	41	0.1183	-0.1222**
Mexico	Developing	2012	73	0.1459	35	0.1400	-0.0058
Netherlands	Developed	2005	422	0.1860	475	0.1624	-0.0237
Nigeria	Developing	2012	114	0.3469	114	0.2996	-0.0473
Norway	Developed	2005	429	0.1548	627	0.1252	-0.0296**
Poland	Developing	2005	189	0.4206	797	0.2616	-0.1591***
Portugal	Developed	2005	169	0.1648	279	0.1173	-0.0475**
Republic of Korea	Developed	2011	4,933	0.2967	3,341	0.2523	-0.0444***
Russia	Developing	2012	84	0.2112	70	0.2579	0.0467
Singapore	Developed	2005	1,835	0.2576	3,532	0.2645	0.0069
Slovenia	Developed	2005	38	0.3526	68	0.1038	-0.2488***
South Africa	Developing	2005	328	0.3609	593	0.2794	-0.0815***
Spain	Developed	2005	521	0.2345	674	0.1432	-0.0913***
Sweden	Developed	2005	868	0.1871	1,292	0.1771	-.0100
Switzerland	Developed	2005	1,051	0.1556	1,211	0.1679	0.0122
Taiwan	Developed	2005	2,862	0.1687	8,411	0.1500	-0.0187***
Thailand	Developing	2012	3,532	0.2862	1,761	0.2668	-0.0194*
Turkey	Developing	2005	42	0.6560	1,77	0.4342	-0.2218***
United Kingdom	Developed	2005	2,196	0.2134	2,444	0.1432	-0.0702***
USA	Developed	2005	18,195	0.1607	20,183	0.1203	-0.0404***

Total	103,024	0.2092	112,418	0.1776	-0.0316***

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 6 presents the countries in our sample (control countries are in italic), their economy status according to the IMF classification, the year of mandatory IFRS adoption, the implied cost of debt for the pre-mandatory as well as post-mandatory adoption period for each sample country, and the difference between both periods. The cost of debt represents the pre-tax interest rate and was derived from total long-term debt and annual interest expense. Based on the IFRS adoption years in comparable economies a fictitious adoption year was chosen for each control country.

4 Results

The following sections discusses our empirical results. We present the key findings per hypothesis, followed by a summary of our robustness tests.

4.1 Test of hypothesis 1a

Table 7 displays the results of estimating OLS regression (1) for cost of equity. Among our primary variables, only the interaction term between the post-adoption period and mandatory IFRS adoption is not significant. The other variables and all continuous control variables have a statistically significant impact on cost of equity and are mostly in line with our expectations. According to the coefficients, firms with greater leverage and higher country-specific risk-free interest rates are more likely to face higher cost of equity. Firm size, on the other hand, can lead to lower cost for larger firms. However, to quantify the impact of IFRS adoption on cost of equity and to test H1a an additional step is required.

By summing up our primary coefficients and testing the differences between the sums, we isolate the IFRS effect. This allows us to create table 8, where the columns separate pre- and post-adoption period, and where the rows split up developing and developed countries, as well as treatment group (mandatory adopters) and control group (non-IFRS adopters). Table 8 implies that mandatory IFRS adoption did not lead to a statistically significant reduction in the cost of equity in developing countries. Instead we see a decrease in the cost of equity by 0.91 percentage points which is slightly lower than the decline of 0.99 percentage points in our control group. This difference is not significant and accordingly mandatory IFRS adoption does neither show positive nor negative effects on the cost of equity. Since this also holds true for developed countries, there is no difference between both country groups which leads to accept of H1a.

Our findings are in line with Daske's et al. (2008) results since they did not identify a significant reduction in cost of equity subsequent to mandatory IFRS adoption. At the same time, they are contradictory to what Li (2010) has found. For developed countries Li (2010) speaks of a significant decline of 47 basis points for mandatory adopters. One reason why Daske et al. (2008) and we did not find a decrease could be that most countries had already accounting standards in place prior IFRS adoption which allowed investors to get access to information which they perceived as reliable and sufficient enough to mitigate information asymmetries. In this case, IFRS adoption can only result in little new information about a firm, and in turn not

drive down cost of equity if this new information does not lead to a significant reassessment of an investor's investment risk. Overall, with regards to the cost of equity this leads to the conclusion that IFRS adoption can only be beneficial in developing countries where investors face a steep learning curve when IFRS is applied, whereas the learning effect is solely marginal in countries with sophisticated accounting frameworks.

Table 7: Pooled regressions

Model	**1 (COE)**	**1 (COD)**	**2**	**3**
Post-adoption period	0.0012***	0.0024*	0.0017***	0.0018***
	(3.88)	(1.85)	(5.16)	(5.44)
IFRS adoption	0.0104***	0.0148***	0.0189***	0.0048
	(8.45)	(3.22)	(3.61)	(1.56)
Developing economy	0.0172***	0.0772***	0.0175***	-0.0267**
	(16.57)	(24.93)	(16.82)	(2.57)
Good governance			0.0199***	
			(17.91)	
High shareholder protection				0.0144***
				(16.03)
Post-adoption period * IFRS adoption	0.0008	-0.0231***	0.0027***	0.0025***
	(1.31)	(10.43)	(3.78)	(3.57)
Post-adoption period * Developing economy	-0.0111***	-0.0288***	-0.0116***	-0.0124***
	(21.38)	(14.72)	(21.71)	(20.85)
IFRS adoption * Developing economy	0.0270***	-0.0127	0.0173	0.0383***
	(2.82)	(0.17)	(1.59)	(4.00)
Post-adoption period * Good governance			-0.0042***	
			(5.71)	
Post-adoption period * High shareholder protection				
IFRS adoption * Good governance			-0.0269***	
			(4.98)	

IFRS adoption * High shareholder protection				-0.0073** (2.21)
Developing economy * Good governance			-0.0101 (0.92)	
Developing economy * High shareholder protection				0.0292*** (2.83)
Post-adoption period * Developing economy * Good governance			0.0026 (1.07)	
Post-adoption period * Developing economy * High shareholder protection				0.0065*** (5.65)
Interest rate	0.0014*** (16.60)	0.0121*** (37.25)	0.0014*** (16.51)	0.0014*** (16.29)
Firm size	-0.0040*** (41.23)	-0.0276*** (91.42)	-0.0040*** (41.18)	-0.0040*** (41.19)
Leverage	0.0346*** (46.19)	-0.0430*** (17.05)	0.0347*** (46.32)	0.0347*** (46.29)
Industry	Included	Included	Included	Included
Country	Included	Included	Included	Included
Constant	0.1231*** (97.35)	0.2905*** (58.32)	0.1228*** (97.10)	0.1228*** (97.10)
Adj. R^2	0.2608	0.1829	0.2613	0.2614
N	45,801	215,385	45,801	45,801

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 7 presents the pooled regression coefficients and t-statistics of the regression models for cost of equity (cost of debt). The regressions are based on 45,801 (215,385) firm-year observations and comprises the years 1993-2016. "Post-adoption period" is a dummy variable equal to one if the observation falls into the post-mandatory adoption period and zero otherwise. The dummy variable "Developing economy" equals one if the headquarter of a firm is located in a country that the IMF classifies as developing or zero if the country is considered developed. "IFRS adoption" indicates whether a firm adopted IFRS mandatorily. "Good governance" is a dummy variable that equals one (zero) if the country's CPI and WGI scores are above (below) the peer group median. "High shareholder protection" is a dummy variable that equals one (zero) if the country's SIPI score is above (below) the peer group median.

Table 8: Developing versus developed countries based on the coefficients in table 7

	Pre-mandatory adoption		Post-mandatory adoption		
	N	**Constructed coefficients**	**N**	**Constructed coefficients**	**Difference**
Developing countries					
(1) Mandatory adopters	444	0.1777	586	0.1686	-0.0091***
(2) Non-adopters	5,260	0.1403	5,665	0.1304	-0.0099***
Difference (1) - (2)		0.0374***		0.0382***	0.0008
Developed countries					
(3) Mandatory adopters	2,470	0.1335	4,408	0.1355	0.0020***
(4) Non-adopters	10,996	0.1231	15,972	0.1243	0.0012***
Difference (3) - (4)		0.0104***		0.0112***	0.0008
Difference (1) - (3)		0.0442***		0.0331***	-0.0111***
Difference (2) - (4)		0.0172***		0.0061***	-0.0111***

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 8 shows the differences between developing and developed countries for the pre-mandatory as well as post-mandatory adoption period. The coefficients were constructed based on the coefficients in table 7.

4.2 Test of hypothesis 1b

Table 7 also shows the pooled regression coefficients and t-statistics of OLS regression (1) for cost of debt. The first interaction term represents the primary difference-in-differences coefficient, showing how cost of debt on firm level was impacted by IFRS adoption. This term explains a statistically significant cost of debt decline of about 2.3 percentage points for IFRS adopters in the post-adoption period.

Table 9: Developing versus developed countries based on the coefficients in table 7

	Pre-mandatory adoption		Post-mandatory adoption		
	N	**Constructed coefficients**	**N**	**Constructed coefficients**	**Difference**
Developing countries					
(1) Mandatory adopters	3,390	0.4448	3,416	0.4529	0.0081***
(2) Non-adopters	34,094	0.3677	27,567	0.3989	0.0312***
Difference (1) - (2)		0.0771***		0.0540***	-0.0231***
Developed countries					
(3) Mandatory adopters	18,686	0.3053	19,412	0.2846	-0.0207***
(4) Non-adopters	46,870	0.2905	62,007	0.2929	0.0024***
Difference (3) - (4)		0.0148***		-0.0083***	-0.0231***
Difference (1) - (3)		0.1395***		0.1683***	0.0288***
Difference (2) - (4)		0.0772***		0.1060***	0.0288***

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 9 shows the differences between developing and developed countries for the pre-mandatory as well as post-mandatory adoption period. The coefficients were constructed based on the coefficients in table 7.

Our constructed coefficients in table 9 help us to identify the combined effects of mandatory IFRS adoption on cost of debt. It appears that mandatory IFRS adoption has a positive effect in developing countries. While cost of debt showed a slight increase of 0.81 percentage points ($p < 0.01$) for mandatory adopters in developing countries, the firms in our control group faced a much higher increase of 3.12 percentage points ($p < 0.01$). On the other hand, when comparing developing countries with developed countries, mandatory adopters in developing countries even experienced a decrease of 2.07 percentage points ($p < 0.01$), so that they did not only benefit more from IFRS adoption than their peers from non-adopting countries (increase of 0.24 percentage points, $p < 0.01$) but also more than mandatory adopters in developing countries

Our findings are consistent with Florou and Kosi (2015) who observed a lower cost of (public) debt post IFRS adoption for a large sample of firms from EU- and non-EU countries. Potentially, this effect is caused by a similar mechanism as already observed for cost of equity in section 4.1, but one must distinguish between public debt financing (e.g. bonds) and private debt financing (e.g. loans). On the one hand, investors in the public debt market and investors in the equity market face similar information asymmetries because they rely heavily on publicly available financial statements (Florou and Kosi, 2015). Consequently, given an improvement in the information environment, firms that majorly finance themselves through public debt can experience a stronger decline in the cost of debt than their peers from non-adopting countries. On the other hand, the private debt market functions slightly differently, because more sources of information and powerful tools (e.g. covenants, renegotiating) are available to lenders. Accordingly, information asymmetries are much lower than in the equity or public debt market. Thus, for firms focused on private debt, IFRS adoption may have no positive effect on cost of debt even if they are located in a developing country, which was confirmed by empirical studies (Florou and Kosi, 2015; Chen et al., 2015). All things considered, the difference between both country groups that we observed is not very likely to be driven by a modification of loan conditions but changed cost of public debt instead.

4.3 Test of hypothesis 2

Table 7 presents the results of regression model (2) and helps to test H3. It is the extended version of regression (1 - COE) but delivers more insights into the role of institutional settings. In order to examine the effect of IFRS adoption on countries with good / bad governance we use the coefficients in table 7 to create table 10. Although mandatory adopters from developing countries with good governance generally show a lower cost of equity, we find that they do not benefit from a stronger decline in cost of equity in the post-adoption period than non-adopters in countries with good governance (-0.88 percentage points vs. -1.15 percentage points, both $p < 0.01$). At the same time, their decline in cost of equity is higher than the decline of mandatory adopters from developing countries with bad governance (decline of 0.72 percentage points, $p < 0.01$). In turn this implies that IFRS adoption does not necessarily lead to a reduction of cost of capital and is even less likely if a firm is located in a country with weak institutional settings. This is in line with findings in prior literature which finds evidence that mandatory IFRS adoption does not lead to an increase in institutional investor demand for equities in countries with weak institutional settings (Florou and Pope, 2012), and therefore is unlikely to cause positive capital-market effects for firms in these countries (Daske, 2008).

Moreover, table 10 proves that our observations for developing countries also hold true for developed countries, which is supported by previous studies (Daske, 2008; Li, 2010; Beneish et al., 2015). Although institutional settings play an important role in developed economies as well as in developing economies, the mandatory adoption of IFRS is not a guarantee for lower cost of capital. This may be due to the fact that good governance countries had already effective financial reporting frameworks in place prior IFRS adoption, so investors did not find incremental improvements or even deteriorations in the information environment when firms started adopting IFRS. For firms in bad governance countries one can argue that no benefit over their peers in the control group is observable because investors did neither see improvements in institutional settings nor reporting incentives. In other words, investors found reasons to believe that the adoption of a high-quality accounting framework did not automatically lead to higher accounting quality. In total, H2 is to be accepted for developing as well as developed countries.

Table 10: Developing versus developed countries under consideration of relative governance quality

	Bad governance					Good governance				
	Pre-mandatory adoption		Post-mandatory adoption			Pre-mandatory adoption		Post-mandatory adoption		
	N	**Constructed coefficients**	**N**	**Constructed coefficients**	**Difference**	**N**	**Constructed coefficients**	**N**	**Constructed coefficients**	**Difference**
Developing countries										
(1) IFRS adopters	260	0.1765	322	0.1693	-0.0072***	184	0.1594	264	0.1506	-0.0088***
(2) Non-adopters	5,260	0.1403	5,665	0.1304	-0.0099***	0	0.1501	0	0.1386	-0.0115***
Difference (1) - (2)		0.0362		0.0389***	0.0027***		0.0093***		0.0120***	0.0027***
Developed countries										
(3) IFRS adopters	909	0.1417	1,956	0.1461	0.0044***	1,561	0.1347	2,452	0.1349	0.0002
(4) Non-adopters	9,869	0.1228	14,290	0.1245	0.0017***	1,127	0.1427	1,682	0.1402	-0.0025***
Difference (3) - (4)		0.0189***		0.0216***	0.0027***		-0.0080***		-0.0053***	0.0027***
Difference (1) - (3)		0.0348***		0.0232***	-0.0116***		0.0247***		0.0157***	-0.0090***
Difference (2) - (4)		0.0175***		0.0059***	-0.0116***		0.0074***		-0.0016***	-0.0090***

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 10 shows the differences between developing and developed countries for the pre-mandatory as well as post-mandatory adoption period when taking into account relative governance quality. The coefficients were constructed based on the coefficients in table 15.

4.4 Test of hypothesis 3

Based on table 7 we not only determine the influence of governance quality, but also the impact of shareholder protection mechanisms. According to table 7, the variable "High shareholder protection" appears to have a high explanatory power since the coefficient of 0.0144 is statistically significant. However, one must also take into account the interaction terms of table 7 to analyze the interrelation of shareholder protection, IFRS adoption and cost of equity. Table 11 brings to light that mandatory IFRS adopters in developing countries with relatively weak shareholder protection mechanisms show a stronger decrease in the cost of equity (-0.0081; $p < 0.01$) than adopters in countries with relatively strong mechanisms (-0.0058; $p < 0.01$). However, in comparison to non-adopters in our control group these declines are lower, so that a benefit of IFRS adoption is not observable. Nevertheless, our observations allow the conclusion that the application of IFRS is more likely to be beneficial if a country exhibits weak shareholder protection mechanisms.

This effect is reversed in developed countries where strong shareholder protection seems beneficial. While mandatory adopters from developed countries with relatively strong shareholder protection experienced no significant change in cost of capital, mandatory adopters from developed countries with relatively weak shareholder protection mechanisms exhibit an increase of 43 basis points ($p < 0.01$). Again, the development for non-adopters is more positive in comparison to mandatory adopters.

Our findings for developed countries are indirectly supported by Houqe et al. (2012) as they present empirical evidence that IFRS adoption leads to higher earnings quality among mandatory adopters if they operate in strong shareholder protection regimes. Since accounting quality in turn is considered a driver of cost of equity, our observed results for developed countries are plausible. This explanation approach cannot be used for developing countries where the results are reversed. One possible explanation for the observed outcome in developing countries could be connected to the perceived quality of financial reporting. Before mandatory IFRS adoption investors assessed financial statements more reliable in countries with relative strong shareholder protection. In the post-adoption period, investors see improvements in financial reporting in both shareholder protection regimes, but these are perceived as much higher in those countries with weak shareholder protection mechanisms. Consequently, a higher reduction in cost of equity can be observed. In total, H3 is to be rejected for developing countries, and to be accepted for developed countries.

Table 11: Developing versus developed countries under consideration of the relative strength of shareholder protection mechanisms

	Weak shareholder protection					Strong shareholder protection				
	Pre-mandatory adoption		Post-mandatory adoption			Pre-mandatory adoption		Post-mandatory adoption		
	N	**Constructed coefficients**	**N**	**Constructed coefficients**	**Difference**	**N**	**Constructed coefficients**	**N**	**Constructed coefficients**	**Difference**
Developing countries										
(1) IFRS adopters	60	0.1392	113	0.1311	-0.0081***	384	0.1755	473	0.1697	-0.0058***
(2) Non-adopters	3,981	0.0961	4,119	0.0855	-0.0106***	1,279	0.1397	1,546	0.1314	-0.0083***
Difference (1) - (2)		0.0431***		0.0456***	0.0025***		0.0358***		0.0383***	0.0025***
Developed countries										
(3) IFRS adopters	693	0.1276	1,875	0.1319	0.0043***	1,777	0.1347	2,533	0.1348	0.0001
(4) Non-adopters	9,710	0.1228	14,107	0.1246	0.0018***	1,286	0.1372	1,865	0.1348	-0.0024***
Difference (3) - (4)		0.0048*		0.0073**	0.0025***		-0.0025*		0.0000	0.0025***
Difference (1) - (3)		0.0116***		-0.0008***	-0.0124***		0.0408***		0.0349***	-0.0059***
Difference (2) - (4)		-0.0267***		-0.0391***	-0.0124***		0.0025**		-0.0034***	-0.0059***

* $p<0.1$; ** $p<0.05$; *** $p<0.01$

Table 11 shows the differences between developing and developed countries for the pre-mandatory as well as post-mandatory adoption period when taking into account the relative strength of shareholder protection mechanisms. The coefficients were constructed based on the coefficients in table 7.

4.5 Robustness tests

a) Controlling for structural break

The financial crisis of 2007/2008 had a major impact on capital markets around the world. To mitigate concerns that these effects distort our results, we test whether there is evidence for a structural break. Using the Chow test, we identify a structural break between 2007 and 2010 ($p < 0.01$) when the cost of equity, on average, increased significantly, before it went down to the before crisis level again after 2010. Accordingly, we exclude this period from our regression to test the robustness of our results for the cost of equity. we find that mandatory adopters in developing countries still experience a significant decrease in the cost of equity of 62 basis points (not tabulated), which is slightly lower than the decline of 84 basis points estimated in section 4.1. The result for mandatory adopters in developed countries improves slightly as the updated regression coefficients indicate a minor decrease of 15 basis points (not tabulated), as compared to an increase of 15 basis points before. Nevertheless, since developing economies show the higher decline, our overall conclusion remains unaffected. For the cost of debt on firm level we do not identify a structural break between 2007 and 2010.

b) Excluding countries with few / many observations

According to our descriptive statistics in section 3.5 the distribution of our firm-year observations is uneven across countries. Some countries only have a low number of observations available. Therefore, by excluding countries with very few observations we make sure that our results are not driven by these countries. For the cost of equity, we exclude all countries with less than 30 firm-year observations in total. This does not change our results. For the cost of debt, we exclude countries with fewer than 100 firm-year observations. Again, we find our results to be robust. To rule out any bias caused by overrepresented countries, we exclude countries with relatively many firm-year observations in an additional test. After excluding the countries with more than 1,000 firm-year observations (cost of equity) and 6,000 firm-year observations (cost of debt), respectively, our results essentially remain the same. Thus, in terms of the cost of capital we do not have to accept (reject) a hypothesis that was previously rejected (accepted).

c) Excluding certain control countries

For testing our hypotheses related to the cost of debt, we chose a set of control countries. Even though these countries have not mandatorily adopted IFRS, some of them have substantially

converged their local standards with IFRS. So, as part of a robustness test we decide to exclude these countries, which leads to no different outcomes for the cost of debt.

5. Conclusions, implications and further research

In this study, we examine the economic consequences of mandatory IFRS adoption from different country classification perspective. Our thesis is centered on the questions whether a decrease in the cost of capital is observable in the post-adoption period, and to what extent there is a difference between country classification, i.e. developing versus developed countries. While extant literature is limited to on the one hand either cost of equity effects or on the other hand cost of debt, we analyze both cost of capital components. In contrast to previous literature, we analyze a long-term horizon, spanning over two decades from 1993-2016. Furthermore, we do not limit our study to a small set of countries. We group all sample countries in accordance with their economic development status (developing versus developed). This classification makes use of the fact that developing (developed) countries share similar risk properties, and overall face the same challenges. Our approach allows us to explore cost of capital effects for these two country groups and to deliver valuable insights for future adopters from either group.

For developing countries, we find that mandatory adopters, on average, benefit from a decline in cost of equity capital of up to 91 basis points after IFRS adoption. In developed countries, on the other hand, mandatory adopters experienced a slight increase of 14 basis points. However, in both cases the decreases in cost of capital are not statistically different from our control group. We do no find results that confirm the positive effects of IFRS adoption as found in prior literature. At the same time, we find support that a country's governance quality determines whether a firm benefit from IFRS adoption, consistent with prior literature. Regardless of economic development status, the outcome for firms in good governance countries are better in relation to firms in bad governance countries. Regarding the role of shareholder protection mechanisms our results are twofold: First, in developing economies IFRS adoption is more beneficial when a country exhibits weak shareholder protection since the decline in cost of equity is lower in countries with strong shareholder protection. Second, this effect is reversed in developed economies where countries with strong shareholder protection experience a smaller increase in cost of equity than their peers from weak shareholder protection regimes. Overall, we conclude that mandatory IFRS adoption does not automatically lead to lower cost of equity, regardless of economic development status and institutional settings.

Apart from cost equity the second important component of cost of capital is cost of debt. Our results show positive effects on cost of debt after IFRS adoption for both country groups. We

identify an advantage of mandatory adopters over non-adopters in developing as well as in developed countries. However, while mandatory adopters in developing countries only experienced a lower increase in cost of debt than non-adopters (81 vs. 312 basis points), firms in developed countries benefitted from a strong decline of 207 basis points in the post adoption period (non-adopters: increase of 24 basis points). Regardless of this major difference, IFRS adoption seems to have positive effects on cost of debt. This shows that future discussions about economic consequences of mandatory IFRS adoption must also consider cost of debt, and not be solely focused on cost of equity.

In conclusion, there is strong evidence that mandatory IFRS adoption can, but does not necessarily have to be beneficial to firms in developing as well as in developed countries in terms of cost of capital. Consequently, depending on the country classification, firms and regulators that plan to adopt IFRS should adjust their expectations when it comes to potential economic benefits from switching to IFRS or imposing mandatory adoption.

Naturally, our study comes along with some limitations. Firstly, our measurement cost of capital is not free of error. As presented in section 3.1, cost of equity estimates from accounting-based valuation models are likely to be biased upward. This is especially critical for countries with relatively few observations where a measurement error can distort the results. Although we deleted countries with very few observations as part of a robustness check without arriving at different results, one should keep this in mind before using our results as a reference for potential future IFRS adopters. The same accounts for the cost of debt where we applied a rather simple approach which in turn directly affects the accuracy of our estimates. Additionally, each firm's capital structure is unique, some firms prefer public debt, whereas others are primarily financed through private debt. This makes it difficult to generalize our results regarding cost of debt on firm level.

Secondly, even though we find significant results for developing countries, the findings should be read with caution. In developing countries there are many unknowns for investors, accordingly, the learning curve for these countries is much higher than for developed countries where investors can rely on knowledge accumulated over many years. Therefore, it is almost impossible to isolate the effect of IFRS adoption because several other factors could have driven cost of capital in developing countries. Lastly, this study is limited to cost of capital although there are many other measures that could describe economic benefits. For instance,

future research should also consider the effect of IFRS adoption on liquidity in equity / debt markets or macroeconomic ratios, such as GDP per capita.

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