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Abstract

Earnings quality is of great concern to corporate stakeholders, including capital providers in international markets with widely varying regulatory pedigrees and ownership patterns. The current study examines the association between the cost of equity capital and earnings quality, contextualised via tests that incorporate the potential for moderating effects around institutional settings. The analysis focuses on and compares evidence relating to (common law) UK/US firms and (civil law) German firms over the period 2005-2018 and seeks to identify whether, given institutional dissimilarities, significant differences exist between the two settings. Consistent with theoretical reasoning and prior empirical analyses we find a statistically negative association between earnings quality, evidenced by information relating to accruals, and the cost of equity capital. However, when we extend the analysis by investigating the combined effect of institutional ownership and earnings quality on financing cost, the impact - while negative overall - is found to vary across legal backdrops. The results are shown to provide potentially important insights for policymakers, creditors and investors about the consequences of earnings quality variability. The results should be of interest to firms seeking to reduce their financing costs and retain financial viability in the wake of the impact of the Covid-19 pandemic. The findings are robust to alternative econometric specifications and alternative measures for both earnings quality and the cost of equity capital.

Keywords: Earnings Quality, Cost of Equity Capital, Accruals, Institutional Ownership, Legal system

1. Introduction

Corporate reporting is critical for the functioning of capital markets as an efficient allocator of scarce investment resources (Healy and Palepu, 2001), reducing the extent of principal-agent information asymmetry and thereby improving firm liquidity whilst lowering the cost of financing (Diamond and Verrecchia, 1991). Agency conflicts necessitate high quality financial reporting in order that "suppliers of finance to corporations assure themselves of getting a return on their investment" (Shleifer and Vishny, 1997, p. 737) and the extant literature indicates that a reduction in information asymmetry enables investors to perform more robust monitoring of managerial activities (see, Lee et al., 2008; El-Helaly, 2016; Hao et al., 2019; Liu and Lee, 2019). Investors with access to the information thus drive reductions in the cost of capital, although uninformed investors will continue to face non-diversifiable information risk, priced through higher expected returns (Easley and O'Hara, 2004). Francis et al. (2004) suggest that "poor-quality reporting impairs the coordination between firms and their investors with respect to the firm's capital investment decisions and thereby creates information risk. Anticipating this, investors demand a higher risk premium; that is, they charge a higher cost of capital" (p. 971). By implication, high quality reporting should improve communication flows between firms and their investors, ultimately resulting in a reduction in the cost of financing.

It is also widely accepted that accounting information and reporting practices are shaped by a number of external factors, including extant legal systems and traditions, in particular the common law - civil law distinction. A large literature suggests that differences in the latter impact on accounting practices (e.g., La Porta et al., 1998; Ball et al., 2000; La Porta et al., 2002; Ball, 2006), with common law countries (i.e., those where the law is customarily established on an un-written basis by precedent and finance is dominated by dispersed shareholdings, typically in the English-

speaking world) generally found to have more transparent accounting systems, stronger investor protection mechanisms and more robust corporate governance practices than do civil law nations (i.e. those where codification of laws and statutes is the norm, along with significant debt holdings and block ownership of equity). However, empirical evidence examining the association between earnings quality and the cost of equity capital is mostly US-based (e.g., Francis et al., 2004, 2005; Verdi, 2006; Bhattacharya et al., 2011), potentially limiting the generalisability of the findings, particularly to civil law countries. The current study investigates the moderating role of a country's legal system on the association between earnings quality and the cost of equity capital to identify the extent to which the latter relationship is influenced by a regulatory base.

It is now generally acknowledged that institutional shareholders have incentives to become well informed about their investee firms and play an active role in monitoring and curbing managers' opportunistic behaviour (Jensen and Meckling, 1976, Pound, 1988, Velury and Jenkins, 2006). Such investors are usually considered to be capable of analysing financial reports more comprehensively and competently than are individual investors (Lemma et al., 2018), in turn helping to alleviate the information asymmetry problem and thereby reducing the cost of financing. Prior evidence indicates that institutional ownership can positively affect earnings quality (Rajgopal et al., 2002; Velury and Jenkins, 2006), firms' financial strength (Chung et al., 2015), dividend pay-out levels (Crane et al., 2016), and performance sensitivity (Hartzell and Starks, 2003). Hence, we posit that institutional ownership can reduce the cost of capital, whether directly - via a firm's ability to increase the scale of its investment programmes and attracting investors by making generous dividends - or indirectly, by enhancing the quality of earnings.

To assess the empirical efficacy of this suggestion, we study the impact of institutional ownership on the association between earnings quality and the cost of equity capital using cross-country data

for a sample of 948 listed companies from the US, the UK, and Germany over the period 2005 to 2018. The analysis focuses on the extent to which favourable values for earnings quality are rewarded in the form of a lower cost of equity capital whilst exploring the moderating role of institutional investor ownership (IOW) and legal system origins in this association. This approach provides a number of contributions to the literature in the area. First, the study enriches the growing body of research on the economic consequences of earnings quality in equity markets and its influence on the cost of equity capital. As noted previously, most previous work in this area focuses on a single country (typically the US), which limits the universality of the evidence presented (Francis et al., 2004, 2005; Gray et al., 2009; Eliwa et al., 2016). We instead examine the issue across nations with different institutional settings, i.e., both those with common law legal backgrounds (in this case, the US, and the UK) and those with a codified civil-law system (here, Germany). Indeed, researchers have generally overlooked the importance of such contextualising factors when examining issues relating to earnings quality (e.g., Francis et al., 2004, 2005; Gray et al., 2009).[i] La Porta et al. (2000) argue that effective legal systems and sound governance factors empower shareholders to force insiders to adopt a higher level of earnings quality, while Zhong et al. (2017) note that country-level institutional settings impact appreciably on earnings quality.[ii] In keeping with the latter evidence, Leuz et al. (2003) document a positive relationship between earnings quality and investor protection at a country level, and we argue here that the strength of such regimes impacts directly on the nature of associations between earnings quality and the cost of equity capital. In this context, Palepu et al (2019) observes that many countries in mainland Europe have been moving towards a model whereby investors' rights are becoming more prominent and stock exchanges are growing in importance. However, the work of La Porta et al. from the late 1990s and the early 2000s placed Germany within the Civil Law tradition where

capital providers' protections are relatively weak, with Gonzalez et al. (2020) actually suggesting that creditor rights in the nation have weakened over the period covered by the present study. In addition, in terms of the ratio of Market Capitalization to GDP German stock exchanges remain much less significant than in the US and the UK with a figure of 54.3% in 2019 compared to 107% for the UK and 164.8% for the US (CEIC data). Further, the number of listed companies in Germany in 2020 (over 450) is much smaller than the number in the UK (over 1800) and the US (over 4500) (World Bank, 2020), while ownership concentration in Germany remains much greater than in the other two nations investigated here (De La Cruz et al., 2019). Thus, comparison of evidence relating to Germany with that pertaining to the US and the UK should allow some meaningful conclusions to be drawn about the impact of regime type on the findings. Second, we test a conditional hypothesis that proposes that the impact of earnings quality on the cost of equity capital is greater among firms with a sizeable proportion of institutional equity ownership. In this regard, the extant literature indicates that institutional ownership can enhance earnings quality by mitigating against any incentive to manage earnings. As institutional investors have significant expertise in monitoring their investee firms - often through robust analysis of company financial statements - they can monitor management and ultimately improve investment efficiency and reduce financing costs (Pound, 1988; Rajgopal et al., 2002, Chung et al., 2015). Third, we explore the extent to which the combined impact of institutional ownership and earnings quality on cost of equity differs in common law and civil law countries. Given the relatively entrenched nature of large blockholdings in governance systems in the latter relative to the former, with the active monitoring role played by these owners reduced (LaPorta et al., 1997; 2000), we would expect the effect to be lower in the US and the UK than in Germany.

The empirical analysis generates a number of key findings. First, it finds a statistically negative association between accruals quality and the cost of equity capital, suggesting that firms with higher levels of accrual quality (lower levels of earnings management) enjoy lower financing costs, while firms with poor accrual quality suffer from higher costs of finance.[iii] This finding extends the single-country results of Eliwa et al. (2016) for the UK firms and Francis et al. (2006) for the US, whereby both reported that the cost of equity capital is negatively associated with earnings quality attributes. Second, in a further increment to the extant literature (particularly Francis et al., 2016 and Eliwa et al., 2016), we find the effect of institutional ownership to be influential, with a significantly positive impact on the association between earnings quality and the cost of equity capital, suggesting in turn that institutional ownership can improve firms' ability to secure cheaper funding by virtue of robust monitoring. While this result holds for the whole sample (the US, the UK and Germany), country-level analysis shows that the result holds only for the common law countries (the UK and the US) and not for Germany, consistent with the notion that extant legal systems are a determining factor in this context. This novel finding[iv] points to a role for institutional investors in monitoring and influencing the quality of financial reports that are valued by the market in its price formation activity. The reported results should have practical implications for all interested parties including reporting companies, investors and governments as well as standard setters tasked with developing high quality accounting standards that will enhance the quality of earnings thereby generating reductions in the cost of finance that are likely to be particularly valuable in the post-pandemic period.

The remainder of the paper is structured as follows. The next section outlines the literature review and hypotheses development. Section 3 sets out the research design process. Section 4 then

presents and discusses the results, while Section 5 concludes the paper, discussing the policy implications of the findings and suggesting avenues for future research.

2. Literature Review and Hypotheses Development

2.1 Earnings Quality and the Cost of Equity Capital

The relationship between earnings quality and the cost of equity capital is based on a theoretical foundation which assumes that information risk is priced as a result of either: (i) the asymmetric information between informed and uninformed investors (Easley and O'Hara, 2004; Bhattacharya et al., 2012); or (ii) variation in the level of information precision that is published by firms (Lambert et al., 2007). In support of this contention, prior research suggests that a high level of earnings quality can significantly reduce the cost of equity capital (e.g., Francis et al., 2005; Verdi, 2006; Core et al., 2008; Gray et al., 2009; McInnis, 2010; Bhattacharya et al., 2011; Bhattacharya et al., 2012; Ogneva, 2012; Barth et al., 2013; Chen et al., 2013; Eliwa et al., 2016). Francis et al. (2004) report one of the first investigations of the association between earnings quality and the cost of equity capital, using a sample of US firms over the period of 1975-2001 and seven attributes of earnings within two bundles. The first bundle consists of four accounting-based attributes of earnings quality: accrual quality, persistence, predictability, and smoothness, while the second comprises three market-based attributes: value relevance, timeliness, and conservatism. The results indicate a significant association between earnings quality measures (examined separately) and the cost of equity capital. In particular, the findings suggest that firms with the least favourable values of each attribute face higher costs of capital than their counterparts with the most favourable values. The study also reports that accounting-based attributes, particularly accrual quality, explain most of the variation in the cost of equity capital. Lee et al. (2008) examines the association

between IFRS adoption and the cost of equity capital across 17 European countries. The results demonstrate a significant reduction in the cost of equity capital following the implementation of IFRS, and so accounting framework is incorporated within our analysis.[v] Similar evidence is provided for Australia by Gray et al. (2009), who investigate the relationship between accruals quality and the cost of equity capital,[vi] while Ng (2011) expands the scope of the work in this area by investigating the effects of information quality on the cost of equity capital (via changes in liquidity risk) over the period 1983 to 2008 using a sample of data for NASDAQ-quoted firms. The findings illustrate that higher information quality is, as predicted, linked to lower liquidity risk, in turn lowering financing costs. Recently, a UK study by Eliwa et al. (2016) examines the relationship between earnings quality and the cost of equity during the period 2005-2011. The study employs four proxies for earnings quality: accruals quality, earnings persistence, earnings predictability, and earnings smoothness and reports a significant negative association between each of the four proxies considered and the cost of equity capital with earnings predictability having the largest impact.

Given the theoretical reasoning and empirical evidence indicative of a negative association between earnings quality and the cost of equity capital, the current study posits that the presence of high-quality earnings negatively affects the cost of equity capital and the first hypothesis we propose is therefore:

H1. Earnings quality is negatively related to the cost of equity capital.

2.2 Earnings Quality, Institutional Ownership and the Cost of Equity Capital

It has been argued that the separation between ownership and control may motivate managers to focus on empire building (Jensen and Meckling, 1976; Shleifer and Vishny, 1997). Therefore, owners need to hold managers accountable for their investment decisions to ensure that they are

acting in the best interest of shareholders. It is also widely accepted that the presence of institutional investors may mitigate the extent of opportunistic managerial behaviour by virtue of the former's monitoring abilities (WSJ, 1996; Velury and Jenkins, 2006). According to the active monitoring hypothesis, the amount of wealth invested provides institutional owners with a strong motivation to manage their investment actively (Velury and Jenkins, 2006). In contrast, minority shareholders may be reluctant to exercise their rights to monitor managers, as the costs involved may exceed any potential benefits that accrue, resulting in a "free rider" problem among investors (Jensen and Meckling, 1976). In this context, Stiglitz (1985) suggests that concentrated ownership is likely to be associated with a higher level of attention being paid to the managerial effort, as scrutiny by institutional investors is likely to curtail managerial deviations from (shareholder wealth) optimising behaviour.

Consistent with this reasoning, prior empirical literature suggests that earnings management is less common in firms with a higher proportion of institutional investors (Mitra and Cready, 2005). Observed practised therefore accords with a scenario whereby institutional investors have the expertise to analyse financial statements meaningfully, thereby encouraging managers to produce the type of high quality report that reduces information asymmetry and lowers the cost of equity capital (Botosan, 1997; Francis et al., 2004; 2005; Velury and Jenkins, 2006; Bhattacharya et al., 2013; Hsieh et al., 2019). Velury and Jenkins (2006) investigate the association between the level of institutional ownership and earnings quality for a sample of US firms for the period 1992-1999, using four proxy measures: predictive value, neutrality, timeliness, and faithful representation. The results demonstrate a significantly positive relationship between institutional ownership and earnings quality.[vii] A more recent study of firm-level data for 41 different countries by Zhong et

al. (2017) points to a similar link between institutional ownership and earnings quality, whilst Lemma et al. (2018) uncover evidence, again identifiable across a large number of countries, of a relationship between institutional ownership and earnings management. Finally, Hsieh et al. (2019) examine the effect of institutional ownership on the link between earnings quality and the cost of equity capital using data for 64 listed firms in Taiwan, covering the period 2000-2017. The results reveal significant variations in the nature of the relationship between earnings quality and cost of finance, with high levels of institutional ownership weakening the negative link between the two. This pattern is attributed to the monitoring/free-riding effects alluded to earlier,[viii] and the current study therefore posits that:

> ***H2: The combined effect of institutional ownership and earnings quality reduces the cost of equity capital.***

2.3 Earnings Quality, Legal System and the Cost of Equity Capital

The extant literature argues that the accounting regime and the legal system are fundamental influences on a country's institutional background (La Porta et al., 1998; Ball, 2006). Indeed, La Porta et al. (1998) have indicated that a country's legal system shapes the country's accounting system, with common law countries purported to have more transparent accounting systems, stronger investor protection, and more robust corporate governance practices than their civil law counterparts. Similarly, Ball et al. (2000) suggest that, relative to the latter, common law countries are characterised by active stock exchanges, a diversified base of investors, higher investor protection, high litigation risk, and a focus on shareholder primacy. In line with this reasoning, empirical research supports the contention that low earnings quality is more prevalent in civil-law countries (Coppens and Peek, 2005; Daske et al., 2006). Similarly, Bushman et al. (2006) provide evidence that firms in common law countries reflect bad news in reported earnings on a timelier

basis than do those in civil law countries.[ix] In this context, a number of studies suggest that the potential monitoring role of large block holders is reduced when debt traditionally represents a high proportion of total financing and where large ownership stakes exist, these tend to have been in place for many years, with close links to management common (LaPorta et al., 1997; 2000; 2006; Fidrmuc et al., 2006). As the latter features tend to be more common in civil law than common law countries, we argue that the strength of the country's legal system impacts on the combined impact of institutional ownership and earnings quality on the cost of equity capital, and develop the third hypothesis on this basis:

> ***H3. The combined impact of institutional ownership and earnings quality on the cost of equity capital is more pronounced in common law countries than in civil law countries.***

3. Research Design

3.1 Data and Sample

The sample for the present paper consists of non-financial companies included in major stock indices in each of the three different countries investigated; the S&P 500 (for the US), the FTSE 350 (the UK), and the CDAX Open-Composite (Germany). As noted earlier, whilst most prior studies in the area focus on single countries, a number of studies have explored issues relating to governance and cost of capital across wide geographic spans (e.g., Persakis and Iatridis, 2017). However, there is growing evidence that levels of national development and market maturity impact on equity and other financing costs (Baker and Wurgler, 2015; Neibel, 2018), and so in the present study, we focus on markets with long histories of supporting international capital in nations defined by high levels of economic development. Data for a total of 1,275 companies were initially sought on this basis, but 327 had to be excluded as a result of the exclusion of financial firms and firms with incomplete or missing data.[x] The final sample, therefore, comprised 948 firms: 401

listed in the US, 215 listed in the UK, and 332 listed in Germany between 2005 and 2018, as detailed in Table 1.

(Insert Table 1 about here)

3.2 Model Specification and Measurement of Variables

3.2.1 The cost of equity capital

Prior studies identify two approaches to measure the cost of equity capital (*CoEC*); the ex-ante approach, which is based on analysts' forecasts (e.g., Francis et al., 2005; Dhaliwal et al., 2006; El Ghoul et al., 2011; Eliwa et al., 2016; Ahmed et al. 2019) and the ex-post approach, which is based on realised returns. The current study uses the former in the main analysis. The latter approach is used as a robustness proxy for *CoEC*, where measures the *CoEC* as the earnings–price ratio of a firm minus the median earnings–price ratio of its industry (IndEP). For the ex-ante measure, we extract analysts' forecast data as recorded in June in the *IBES* Database for sample firms. We remove firms with negative two years ahead consensus earnings forecasts and have negative long-term growth forecasts from our sample. Our ex-ante measure ($CoEC_{MEAN}$) is based on the average of three ex-ante measures to decrease the measurement errors (Hail and Leuz, 2006). Figure 1 outlines our proxy for the $CoEC_{MEAN}$ including (i) the price-earnings-growth ratio measure (r_{PEG}) (Easton, 2004); (ii) the modified price-earnings growth ratio measure (Easton, 2004) (r_{MPEG}); and (iii) the modified economy-wide growth measure (Gode and Mohanram, 2003) (r_{GM}).

3.2.2 Earnings Quality (EQ) Measures

There is no generally accepted measure for earnings quality. Rahman et al. (2010) argue that accrual measures can inform shareholders about cash flow potential as they incorporate assumptions about future inflows and outflows, while Callen and Segal (2004) suggest that

accruals enhance current stock returns and are therefore inherently value-relevant on this basis. Accrual-based variables provide a range of informative perceptions about earnings quality (Francis et al., 2004; Dechow et al., 2010) by emphasising the extent to which accrual-related accounts match with cash flows from operations for the previous, last, current, and next period (Dechow & Dichev, 2002). A significant relationship between accruals and cash flow from operations indicates high earnings quality.

A number of models have been used to measure accruals quality, including Jones (1991), Kasznik (1999), Dechow and Dichev (2002), Francis et al. (2005); Kothari et al. (2005), and McNichols and Stubben (2008). To reflect the broad approach used in the prior research, four measures of accruals - based on modified versions of the Jones (1991) model - are employed here: (i) the Kasznik (1999) model; (ii) the model of discretionary revenues developed by McNichols and Stubben (2008) and Stubben (2010); (iii) the cross-sectional model designed by Francis et al. (2005); and (iv) the performance-adjusted discretionary accruals model developed by Kothari et al. (2005). Our choice is based on two rationales. First, the current examination involves data from three countries; hence, simple models may facilitate a larger sample frame and minimise the impact of inconsistencies in the measurement of earnings quality. Second, these variants of the Jones (1991) model of accruals permit the accounting policy and practice choices of a company to be estimated, as they are broad enough to capture the impact of institutional influences on accounting practices within a firm (Rahman et al., 2010). Indeed, Haw et al. (2004) argue that these modified Jones' models capture the tendency of insiders to either overstate reported earnings in order to conceal resource diversion or understate earnings in years of enhanced performance to cultivate reserves in case of future financial difficulties. Consistent with the prior research, the present study

uses the cross-sectional accrual quality model of Dechow and Dichev (2002), as modified by McNichols (2002), and Francis et al. (2005) and presented in Equation 1:

$$WCA_{i,t} = \beta_0 + \beta_1 CFO_{i,t-1} + \beta_2 CFO_{i,t} + \beta_3 CFO_{i,t+1} + \beta_4 \Delta Sales_{i,t} + \beta_5 PPE_{i,t} + \varepsilon_{i,t} \qquad \textbf{Equation 1}$$

where: $WCA_{i,t}$ represents working capital accruals, computed as the change in non-liquid current assets, less the change in current liabilities, plus the change in short-term debts. $CFO_{i,t-1}$, $\beta_2 CFO_{i,t}$, $\beta_3 CFO_{i,t+1}$ signifies lagged, current, and future cash flow from operations. All variables are scaled by lagged total assets. Earnings quality (*EQ*) is calculated as the standard deviation of the residuals of Equation (1), calculated over year t-4 to t. Large standard deviations of residuals indicate poor accruals quality. Equation (1) is estimated for each industry with at least 15 firms in year *t*. In this regard, if a firm has steadily high residuals for a period of time, the standard deviation of these residuals will be small; therefore, the firm will enjoy comparatively high accruals quality as a result of lower uncertainty about its accruals (See Eliwa et al., 2016).

3.2.3 Control variables

The relationship between earnings quality and the cost of equity capital is analysed on the basis of holding all other explanatory variables constant. Prior research in this field typically uses four such controls: firm size (*Size*), market beta (*Beta*), leverage (*Leverage*), and growth (*Growth*) (see, e.g., Francis et al., 2005; Core et al., 2008; Gray et al., 2009, Eliwa, et al., 2016). *Size* is measured as the logarithm of total assets in year *t*, while *Beta* is based on the Capital Assets Pricing Model (CAPM) using 60 months data. *Leverage* is quantified as total debt deflated by total assets in year *t*, and *Growth* is computed as the logarithm of 1 plus the percentage change in equity compared to the previous year (Francis et al., 2005; Core et al., 2008; Gray et al., 2009). According to prior

studies' findings, we anticipate a positive relationship between the cost of equity capital and *Beta* and *Leverage*, while we expect to see a negative association with *Size* and *Growth*.

3.2.4 Institutional Ownership Measurement

Following Sun et al. (2018), we define institutional ownership (*IOW*) as the percentage of equity held by institutional investors (investment banks or institutions) who own more than 5% of a firm's issued shares.[xi]

4. Empirical Analysis and Results

4.1 Descriptive Analysis

Table 1 outlines descriptive statistics for each of the variables, including earnings quality measures, the cost of equity capital proxies, and the controls. The mean of *EQ* ranges from 0.055 and 0.318, within the span reported by prior studies in the area, including Kothari et al. (2005). Means of 0.115 and -0.055 are recorded for *CoEC* and *IndEP*, respectively, again consistent with earlier evidence (e.g., Francis et al., 2004; Eliwa et al., 2016). Table 2 provides a descriptive analysis for data relating to the control variables with *Growth*, *Leverage*, *Beta*, and *Size* generating means of 1.88, 0.228, 0.940, and 14.50, respectively. Table 3 indicates the correlation coefficients calculated for the variables used in the main investigation. Whilst the data indicates a positive and significant correlation among all independent variables, the coefficients are all below 0.4.[xii] More generally, Table 3 outlines a positive and a significant correlation between *CoEC* and earnings quality, which indicates a negative correlation between the two said variables.

(Insert Tables 2 & 3 here)

4.2 Regression Results

This section outlines the results of examining the relationship between *CoEC* and *EQ*. Prior to performing this examination, we first test the association between the *CoEC* and risk factors (Equation 2) employed by prior research including firm size (*Size*), market beta (*Beta*), leverage (*Leverage*), and growth (*Growth*) (see, e.g., Francis et al., 2005; Core et al., 2008; Gray et al., 2009, Eliwa, et al., 2016). The association between *CoEC* and *EQ* is then examined via Equation 3. We used a clustered standard error pooled regression by country and industry to control for cross-sectional correlation (Frankel et al., 2011). Year dummies were also included to control for time-series correlation.

$$\mathrm{CoEC}_{i,t} = \beta_0 + \beta_1 \text{Risk Factors (controls)}_{i,t} + \sum \text{Industry} + \sum \text{Country} + \sum \text{Year} + \varepsilon_{i,t} \quad \boldsymbol{Equation\ 2}$$

$$\mathrm{CoEC}_{i,t} = \beta_0 + \beta_1 \mathrm{EQ}_{i,t} + \beta_2 \text{Risk Factors (controls)}_{i,t} + \sum \text{Industry} + \sum \text{Country} + \sum \text{Year} + \varepsilon_{i,t} \quad \boldsymbol{Equation\ 3}$$

Panel A of Table 4 (Equation 2) details the results from the base model examining the relationship between the risk factors (the controls) and *CoEC*. The evidence appears to validate the *CoEC* estimation procedure adopted in the study. As expected, we find that the cost of equity is positively related to market beta (i.e., companies with a higher value of the latter have a higher cost of equity) and negatively related to firm size (i.e., small firms have a higher cost of equity). The mean coefficient on these variables is consistent with the relationships reported in Panel A of Table 4. In particular, *Beta* generates a coefficient of 0.01 and a p-value of less than 0.01, suggesting that an average implied market risk premium of 1 percent of the sample is similar in magnitude to the historical market risk premium used in previous studies. *Size* has a significant negative coefficient in the base models indicating that large stocks have smaller expected returns. In contrast, the results

reveal that *Growth* and *Leverage* both have a significant positive influence on *CoEC*, thus confirming that the evidence here is broadly in line with the pioneering work of Francis et al. (2005) and implying that the current study's base model is valid in terms of its employment in the next stage of the analysis.

Panel B of Table 4 (Equation 3) outlines the results of the first examination of the relationship between *CoEC* and EQ, reporting a statistically positive link between the two variables with a coefficient of 0.067 and a p-value of less than 0.01. As *EQ* is measured as the standard deviation of residuals from equation 1, this piece of evidence suggests that a rise in the level of earnings management (i.e. lower EQ) leads to a rise in the cost of equity capital, whilst high earnings quality can lower *CoEC*. In addition, Panel B of Table 4 notes an adjusted-R^2 value of 0.182, suggesting that earnings quality explains more than 18% of the variation in *CoEC*, compared to only 15.1% in the base model. Overall, the evidence in Table 4 provides support for hypothesis H1.

(Insert Table 4 here)

Table 5 outlines the empirical results relating to the combined role of institutional ownership and earnings quality on *CoEC* generated on the basis of Equation 4:

$$\mathrm{CoEC}_{i,t} = \beta_0 + \beta_1 \mathrm{EQ}_{i,t} + \beta_2 \mathrm{IOW}_{i,t} + \beta_3 \mathrm{EQ} * \mathrm{IOW}_{i,t} + \beta_4 \mathrm{Controls}_{i,t} + \sum \mathrm{Industry} + \sum \mathrm{Country} + \sum \mathrm{year} + \varepsilon_{i,t}$$

Equation 4

Inspection of Panel A of Table 5 reveals that the interaction between *EQ* and *IOW* (*EQ*IOW*) is negatively and significantly related to *CoEC*, with the coefficient of -0.094 (and related p-value of 0.01) suggesting that *IOW* plays an important role for the sample as a whole in terms of market participants' appraisal of the risk associated with share ownership. These results support hypothesis H2 and, in so doing, imply that institutional investors are capable monitors of earnings quality. In this regard, Bushee (1998) indicates that institutional monitoring is facilitated through

corporate governance processes that emphasise the importance of information relating to managerial decisions. Hence, when the level of *IOW* is sufficiently high, vigorous monitoring motivates managers to provide quality earnings (Gillan and Starks, 1998; Chung et al., 2002).

Panel B of Table 5 (based on Equation 4) provides evidence regarding the impact of any interaction between *IOW* and *EQ* on the *CoEC* across the three countries included in the study's sample frame. As noted earlier, this analysis permits the identification of differences in the effect of *IOW* in common law and civil law settings. The results from Panel B of Table 5 demonstrate variability in the outcomes on this basis. Although *EQ* is positive in all cases (significant in two) and *IOW* – on its own – is insignificant in all cases, the interaction variable *IOW*EQ* (consistent with hypothesis H3) has a negative relationship with the cost of equity capital in both the US and the UK, but plays no role in Germany. This result suggests that in nations with robust regulatory systems and well-diversified and large (proportionally) share-based financing, large institutional shareholdings and earnings quality work together to reduce the *CoEC* and vice-versa. In Germany, this combined role does not manifest itself in our data, with the interaction between institutional ownership and earnings quality having no impact over and above the effect of the latter on its own. By implication, where institutions dominate in terms of ownership and control, with many of the blockholdings persisting for decades (LaPorta et al., 1997; 2000) their monitoring role is less effective, and market reliance on earnings quality remains strong. As discussed above, the US and the UK share some key features in institutional settings relating both to legal system origin and shareholder ownership, whereas traditions and patterns in Germany in both these regards differ markedly. The results in Table 5 are consistent with extant literature in this area, where it is argued that legal system and governance customs are important influences on a country's institutional background (La Porta et al., 1998; Ball, 2006 (Coppens and Peek, 2005; Ball, 2006; Bushman et al., 2006;

Daske et al., 2006). Our evidence extends this body of work by identifying a clear difference in the role played by large blockholdings on the relationship between earnings quality and cost of equity across nations with differing institutional traditions.

(Insert Table 5 here)

4.3 Robustness Analysis

The analysis included some sensitivity tests of the main regressions. First, we use the industry-adjusted earnings price ratio (*IndEP*) as an alternative measure of the cost of equity capital. In this case, *IndEP* is defined as the earnings-price ratio of a firm less the median earnings price ratio for its industry. To this end Equation 5 is employed, as in Eliwa et al. (2016):

$$IndEP_{i,t} = \beta_0 + \beta_1 \mathrm{EQ}_{i,t} + \beta_2 \mathrm{IOW}_{i,t} + \beta_3 \mathrm{EQ} * \mathrm{IOW}_{i,t} + \beta_4 \mathrm{Controls}_{i,t} + \sum \mathrm{Industry} + \sum \mathrm{Country} + \sum \mathrm{year} + \varepsilon_{i,t}$$

Equation 5

The results based on this measure are reported in Table 6 (Equation 5). A comparison between the results of Tables 4 and 5 (based on the implied *CoEC*) and those reported in Table 6 (based on *IndEP*) indicates the confirmatory nature of the latter findings. In particular, Panel A of Table 6 reports a positive and significant relationship between *IndEP* and earnings quality with a coefficient of 0.86 and a p-value of less than 0.05, suggesting that earnings quality matters in the determination of financing costs. Panel B of Table 6 indicates a strong negative relationship between *IndEP* on the one hand and the interaction between earnings quality and institutional ownership on the other, pointing to the role of contextualising factors in affecting the cost of equity capital.

(Insert Table 6 here)

Finally, we perform a robustness analysis for EQ, on the basis of the performance-adjusted measure of earnings quality developed by Kothari et al. (2005) from Jones (1991)'s formulation:

$$KTA_{i,t=}\beta_0 + \beta_1\left(\frac{1}{Assets_{i,t-1}}\right) + \beta_2 \Delta Sales_{i,t} + \beta_3 PPE_{i,t} + \beta_4 \Delta CFO_{i,t} + \beta_5 ROA_{i,t} + \varepsilon_{i,t}\ Equation\ 6$$

where $KTA_{i,t}$ is total accruals, measured as the change in non-cash current assets less the change in current non-interest-bearing liabilities, less the depreciation and amortisation expenses for firm i in year *t*, deflated by lagged total assets. $ROA_{i,t}$ is the return on assets computed as net income divided by lagged total assets. The absolute value of residuals from Equation 6 is employed as another *EQ* measure (as in Kothari et al., 2005) and used in Equation 7

$$CoEC_{\mathrm{i,t}} = \beta_0 + \beta_1 EQ_{i,t} + \beta_2 IOW_{i,t} + \beta_3 EQ * IOW_{i,t} + \beta_4 \mathrm{Controls}_{\mathrm{i,t}} + \sum \mathrm{Industry} + \sum \mathrm{Country} + \sum \mathrm{year} + \varepsilon_{\mathrm{i,t}}\quad Equation\ 7$$

The results are reported in Table 7. Inspection of the latter indicates consistency with the reported in Tables 4 and 5. In particular, Panel A of Table 7 reports a significant positive relationship between *CoEC* and earnings quality with a coefficient of 0.03 and a p-value of less than 0.01, while Panel B Table 7 indicates a negative relationship between *CoEC* and the interaction between earnings quality and institutional ownership.

(Insert Table 7 here)

5. Conclusion and Discussion

This study has provided novel empirical evidence regarding the association between the cost of equity capital and earnings quality for a cross-country (the US, the UK and Germany) sample of non–financial firms between 2005 and 2018. Drawing on prior research, we estimate two earnings quality measures and four proxies for the cost of equity capital as well as a set of four control variables. The results indicate a statistically positive association between earnings quality and the cost of equity capital; firms with higher levels of earnings quality enjoy lower levels of financing costs and vice versa. The findings have been shown to be robust to changes in the definition of both financing costs and earnings quality. Importantly, while we also report a significant combined role for institutional ownership and earnings quality on the cost of capital, this is found to exist only for the two common law nations in the sample, and not for Germany. This result is argued to be indicative of market recognition that the positive benefits of institutional owners' monitoring are tempered by the agency issues arising at the levels found in many civil law contexts.

The results are of potential importance for a number of parties. In particular, they suggest that market participants are relatively sophisticated in terms of the processes driving financing costs, with mechanisms differing according to regulatory and governance customs. Awareness of this subtlety in market outcomes is likely to be valuable for policymakers, creditors, investors, and all those with interest in understanding the determinants of equity capital costs for listed firms, especially following the Covid-19 pandemic which is having a catastrophic impact on companies' financial performance and their abilities to remain solvent. We fully acknowledge that the study has a number of limitations. First, this paper employs institutional ownership as a mediating variable in the association between earnings quality and the cost of equity capital, but this is not intended to suggest that it is the only measures of relevance in this context and additional research

might usefully expand the analysis to incorporate other forms of ownership including state and foreign bases. Second, and suggestive of another avenue for developing the work presented in the study, we have used accrual measures of earnings quality. Again, this is not designed to represent a definitive proxy for the latter, and future research could explore the extent to which the measure employed captures the notion of quality as perceived by market participants themselves. More generally, considering the repercussions of the COVID-19 pandemic for financial markets all over the world, future research might usefully investigate how this pandemic could impact firm financing and cost of capital.

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Table 1: Industry and Country Analysis

Sector	Country			Total
	US	UK	Germany	
Information Technology	49	18	70	137
Utilities	26	8	11	45
Health care	50	14	37	101
Telecommunications	4	5	7	16
Manufacturing	75	42	73	190
Services	113	98	98	309
Material	2	4	26	32
Food and beverage	52	20	8	80
Energy	30	6	2	38
Total firms	401	215	332	948
Total observations	5,614	3,010	4,648	13,272

Note: This table details the industry and country distribution for the sample data.

Table 2: Descriptive Statistics

Variable	Mean	SD	0.250	Medan	0.750
CoEC	0.115	0.0785	0.0796	0.0966	0.126
IndEP	-0.0549	0.991	-0.117	0	0.0820
Growth	1.887	1.014	1.100	1.916	2.599
Leverage	0.228	0.181	0.0875	0.211	0.329
Beta	0.940	0.571	0.550	0.881	1.250
Size	14.50	2.458	12.91	14.84	16.29
IOW	0.594	0.491	0	1	1
EQ (Francis et al. 2005 model)	0.0618	0.0589	0.0257	0.0439	0.0773
EQ_2(*Kothari et al. 2005 model*)	0.173	0.188	0.0484	0.110	0.231

Note: This table provides descriptive statistics about variables employed in the study. *CoEC* refers to the cost of equity capital which is measured as the mean of three ex-ante proxies: the price-earnings-growth model; the modified price-earnings growth model (Easton, 2004); and the modified economy-wide growth model. *IndEP* refers to the earnings–price (EP) ratio of a firm minus the EP for its industry; Market Beta (*Beta*) is calculated based on 60-rolling monthly date acquired from firm-specific CAPM estimations; Size is measured as the natural logarithm of total assets of firm i in year t; Growth is measured as the natural logarithm of 1 plus the percentage change in equity compared to previous year; Leverage is measured based on total debt deflated by total assets of a firm i in year *t*. IOW indicates the percentage of institutional ownership held as part of stakes greater than 5%. *EQ* refers to earnings quality measured based on a cross-sectional accrual quality model of Dechow and Dichev (2002) modified by McNichols (2002) and Francis et al. (2005). EQ_2 refers to earnings quality based on the performance-adjusted measure of earnings quality developed by Kothari et al. (2005).

Table 3: Correlations

	CoEC	***Growth***	***Leverage***	***Beta***	***Size***	***IOW***
CoEC	1					
Growth	0.0601	1				
	<0.0001					
Leverage	0.0152	0.0604	1			
	0.109	*<0.0001*				
Beta	0.0501	0.0318	0.0138	1		
	<0.0001	0.0011	0.1425			
Size	-0.3246	0.322	0.2142	0.1824	1	
	<0.0001	*<0.0001*	*<0.0001*	*<0.0001*		
IOW	-0.07	-0.0556	0.0457	0.0656	-0.0184	1
	<0.0001	*<0.0001*	*<0.0001*	*<0.0001*	0.0225	
EQ	0.1425	-0.1787	-0.1499	0.0106	-0.3077	-0.0122
	<0.0001	*<0.0001*	*<0.0001*	0.3881	*<0.0001*	0.2629

Note: This table provides the results of the correlation test for the variables employed in the empirical analysis.

Table 4: The Relationship between the Cost of Equity Capital and Earnings Quality

Variables	Panel A: Base Model	Panel B: *EQ* Model
Growth	0.198***	0.013***
	(19.09)	(10.0)
Leverage	0.066***	0.067***
	(10.46)	(10.7)
Beta	0.010***	0.010***
	(5.48)	(5.33)
Size	-0.015***	-0.012***
	(-28.12)	(-18.9)
EQ		0.067***
		(3.52)
Constant	0.271***	0.25***
	(35.60)	(27.0)
N	5648	5648
adj. R^2	0.151	0.182
Year dummies	Yes	Yes
Country dummies	Yes	Yes
Industry Dummies	No	No

Note: This table details results relating to equations 2 and 3, examining the relationship between *CoEC* and the risk factors (Panel A). It also outlines the results of the model examining the relationship between *CoEC* and *EQ* (Panel B). *** indicates significance at the 1% level.

Table 5: The Combined Effect of Institutional Ownership and Earnings Quality on Cost of Equity Capital

Variables	Panel A: Institutional Ownership Effect	Panel B: Country Level Analysis		
		US	UK	Germany
Growth	0.013***	0.0066***	0.0052*	0.019***
	(10.1)	(4.31)	(1.79)	(7.90)
Leverage	0.066***	0.040***	-0.0077	0.12***
	(10.6)	(5.99)	(-0.66)	(8.72)
Beta	0.010***	0.014***	-0.0022	0.032***
	(5.28)	(6.39)	(-0.67)	(6.51)
Size	-0.012***	0.0025**	-0.010***	-0.017***
	(-18.7)	(2.57)	(-7.78)	(-14.5)
EQ	0.12***	0.044**	0.10	0.17***
	(4.33)	(2.12)	(1.41)	(4.01)
IOW	0.0054*	0.0038	0.0082	-0.0014
	(1.80)	(1.17)	(1.43)	(-0.22)
*IOW*EQ*	-0.094***	-0.014*	-0.067*	0.0087
	(-2.62)	(-1.69)	(-1.82)	(0.13)
Constant	0.25***	0.042**	0.21***	0.25***
	(26.2)	(2.43)	(11.2)	(13.1)
N	5648	1921	1752	1975
adj. R^2	0.183	0.152	0.156	0.198
Year dummies	Yes	Yes	Yes	Yes
Industry Dummies	No	Yes	Yes	Yes

Notes: This table reports results relating to equation 4, testing the role of institutional ownership for the whole sample (Panel A: IOW*EQ) and for a country-level analysis (Panel B) in mediating the relationship between *CoEC* and *EQ*. A */**/***indicates significance at the 10%/5%/1%level.

Table 6: The Relationship between Industry-Adjusted Earnings-Price Ratio and Earnings Quality

Variables	**Panel A: *CoEC* and *EQ***	**Panel B: *CoEC* and *EQ**IOW**
	IndEP	*IndEP*
Growth	-0.026	-0.025
	(-1.04)	(-0.99)
Leverage	0.088	0.079
	(0.74)	(0.66)
Beta	0.060	0.058
	(1.64)	(1.59)
Size	-0.00074	-0.0013
	(-0.058)	(-0.10)
EQ	0.86**	1.53***
	(2.46)	(2.94)
IOW	-0.020	-0.089
	(-0.50)	(-1.59)
*IOW*EQ*		-1.16*
		(-1.74)
Constant	0.069	0.12
	(0.40)	(0.67)
N	3008	3008
adj. R^2	0.05	0.06
Year dummies	Yes	Yes
Country dummies	Yes	Yes
Industry Dummies	No	No

Note: This table reports results relating to equation 5, testing the relationship between *CoEC* and risk factors (Panel A). It also outlines the results relating to the relationship between *CoEC* and *EQ* (Panel B) using an alternative measure for the cost of equity capital which is the earnings–price ratio of a firm less the median earnings–price ratio of its industry (*IndEP*). A */**/***indicates significance at the 10%/5%/1%level. IOW = institutional investor ownership.

Table 7: The Association between Cost of Equity Capital and Earnings Quality on the basis of Kothari (2005)'s Estimator

Variables	**Panel A: *CoEC* and *EQ***	**Panel B: *CoEC* and *EQ*IOW***
Growth	0.0085***	0.0086***
	(7.73)	(7.86)
Leverage	0.058***	0.057***
	(10.6)	(10.5)
Beta	0.015***	0.014***
	(9.45)	(9.43)
Size	-0.012***	-0.012***
	(-22.2)	(-22.1)
IOW	-0.00049	0.0078***
	(-0.27)	(3.17)
EQ	0.030***	0.060***
	(5.80)	(7.52)
*IOW*EQ*		-0.051***
		(-4.94)
Constant	0.27***	0.26***
	(35.0)	(34.0)
N	7,953	7,953
Adj. R^2	0.214	0.216

Notes: This table reports results to equation 7, testing the role of institutional ownership (Panel A: IOW*EQ) in mediating the association between *CoEC* and *EQ* using an alternative measure (EQ) for earnings quality based on the performance-adjusted measure of earnings quality developed by Kothari et al. (2005). A */**/***indicates significance at the 10%/5%/1%level. IOW = institutional investor ownership.

Figure 1: Formulas for the implied cost of equity capital models

Proxy	Common name	Formula
r_{PEG}	Price-earnings growth ratio model (PEG) (Easton, 2004)	$r_{PEG} = \sqrt{\frac{E(eps_2) - E(eps_1)}{P_0}}$
r_{MPEG}	Modified price-earnings-growth ratio method (Easton, 2004)	$r_{MPEG} = A + \sqrt{A^2 + (E(eps_2) - (E(eps_1))/P_0}$ $A = E(dps_1)/2P_0$
r_{GM}	The modified economy-wide growth model (Gode and Mohanram, 2003)	$r_{OJN} = A + \sqrt{A^2 + \left(\frac{eps_1}{P_0}\right) \times (\frac{eps_2 - eps_1}{eps_1} - (\gamma - 1))}$ Where: $A = \frac{1}{2}\left(\gamma - 1 + \frac{dps_1}{P_0}\right)$. P_t = share price the period *t*. eps_t= earnings per share at the period *t*. dps_t = dividends per share at the period *t*. γ = the rate of growth in abnormal earnings post forecast horizon. In implementing the model, γ is equal to the risk-free rate less 3%, where the 3% represents economy-wide growth.
$CoEC$	The implied measure of cost of equity capital	The mean of r_{PEG}, r_{MPEG} and r_{GM}.

ENDNOTES

[i] An exception is represented by Rahmat et al. (2020) who find that although engagement in related party transactions by East Asian firms reduces earnings quality (measured via discretionary accruals), the impact can be reduced by effective regulation.

[ii] For example, earnings are more timely in common law countries than in civil law ones (Ball et al., 2000).

[iii] Among a range of earnings quality proxies (including accrual quality, earnings persistence, earnings predictability, earnings smoothness, value relevance, timeliness and conservatism), Francis et al. (2004) indicate that accrual quality is the most influential in terms of cost of equity capital.

[iv] Robust to a number of alternative econometric specifications and alternative measures for both earnings quality and the cost of capital.

[v] In this regard, Sun et al. (2011) notes that both the US GAAP and IFRS are considered to be high quality accounting frameworks with the implementation of the latter leading to a demonstrable improvement in earnings quality.

[vi] Although the results imply that equity costs are most strongly influenced by innate accrual quality and not the discretionary component.

[vii] Leading the authors to state that "institutional investors have incentives to monitor the quality of earnings and also the power to discipline managers who report low quality accounting numbers" (p. 1044).

[viii] See also Fidrmuc et al. (2006).

[ix] See also Elshandidy et al. (2015)

[x] Consistent with many international studies within accounting and finance research (e.g., Beck and Demirguc-Kunt, 2006; Beck et al., 2008; Hope et al., 2011), data was collected from Thomson-Reuters, DataStream and W/B/E/S.

[xi] IOW data was obtained from Thomson-One-Banker.

[xii] As Dohoo et al. (1997) and others note, at these levels of association multicollinearity is unlikely to be a problem, with the danger only becoming severe at scores of 0.9 or above.