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Abstract

The aim of this paper is to study the longstanding relationship between corporate tax avoidance and ex ante equity cost of capital in Europe, taking into consideration country specific characteristics, which are essential in a context of corporate tax competition. We find that investors apprehend tax avoidance differently at distinct levels of tax avoidance. We provide strong evidence that as low tax avoidance firms engage in greater tax avoidance, the ex ante equity cost of capital decreases. On the contrary, when high-tax avoidance firms undertake greater levels of tax avoidance, the ex ante equity cost of capital appears to increase. The benefits for firms engaged in lower tax avoidance are greater from 2008 onwards, during the period of financial crisis. These results confirm that in Europe a non-linear convex relationship exists between tax avoidance and ex ante equity cost of capital. Finally, we explore the impact of institutional characteristics and results suggest that in English common law countries the effect of corporate tax avoidance on ex ante equity cost of capital appears to be lower than that in other legal origins¹.

Key words: Cost of capital; Taxation; Corporate tax avoidance.

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Introduction

What is the impact on the ex ante equity cost of capital when firms deviate from (and subsequently move towards) their optimal level of tax avoidance amongst European firms? The effect of corporate taxation on cost of capital and capital structure has been discussed in the literature since the seminal paper of Modigliani and Miller (1958), which motivated Jensen and Meckling (1976) and Myers' (1977) works on capital structure choices and firms' investment decisions, and Jensen's (1986) on how debt disciplines managers, and behavioural theories of capital structure grounded in Titman (1984), amongst others. Nevertheless, the relation between corporate tax avoidance and cost of capital has received little attention.

Recently, Cook, Moser and Omer (2015), in a study focussed in the US, propose a nonlinear convex relationship between corporate tax avoidance and ex ante (i.e., beforehand) cost of capital: when firms with a low level of tax avoidance engage in additional tax avoidance, a firm's ex ante equity cost of capital decreases. On the other hand, when firms with a high level of tax avoidance engage in greater corporate tax avoidance, a firm's ex ante equity cost of capital increases. Cook, Moser and Omer (2015) aim to address an optimal level of corporate tax avoidance, which minimizes the ex ante equity cost of capital, and thus enhances firms' value. Despite the significant contribution of their work to understanding the longstanding relationship between corporate tax avoidance and cost of capital, theirs is a US-specific study, and thus their conclusions may well do not hold in a context of more corporate tax competition. Therefore, our study has a twofold aim. Firstly, to perform and recreate Cook, Moser and Omer's (2015) analysis for listed European firms, in order to assess whether there is a U-shaped relationship between corporate tax avoidance and ex ante equity cost of capital amongst European countries. Secondly, to determine whether countries' institutional characteristics (namely, their legal origin) shape the effect exerted by tax avoidance on the ex ante equity cost of capital.

Firms' expectations cannot be strictly measured, and often not all expectations are realized, therefore an ex ante measure of equity cost of capital is used. The ex ante approach is based on the constant dividend growth model and on the consensus of financial analysts' earnings growth forecasts. In this study, tax avoidance is defined following the model in Hanlon and Heitzman (2010), as a decrease of a firm's explicit taxes.

The empirical analysis uses an unbalanced dataset that comes mainly from Thomson Reuters Eikon, including I/B/E/S, and comprises 4,630 firm-level observations of 1,498 firms listed on the stock exchanges of 24 European countries from 2005 through to 2014. To obtain a robust estimation, instrumental variables are used to control for the potential effects of unobserved characteristics. Two measures of tax avoidance are used to examine the relationship between tax avoidance and ex ante equity cost of capital – and tripartite our sample – low, medium and high level of tax avoidance.

The analysis begins by confirming Cook, Moser and Omer's (2015) U-shaped association between tax avoidance and ex ante equity cost of capital. We infer that as tax avoidance increases from lower avoidance to higher avoidance, the ex ante equity cost of capital appears to decrease, which indicates that investors' perception of tax avoidance changes from inauspicious to auspicious. That is to say, investors recognize that benefits of tax avoidance to surpass its costs. The benefits for firms engaged in lower tax avoidance are greater from 2008 onwards, during the period of the financial crisis. On the other hand, as tax avoidance increases from higher avoidance to even greater levels, the ex ante equity cost of capital appears to timidly increase, indicating that investors perceive that costs of tax avoidance surpass its benefits. Thus, firms that exhibit low levels of tax avoidance are able to decrease ex ante equity cost of capital by undertaking greater levels of tax avoidance, whereas firms that exhibit greater levels of tax avoidance are able to decrease ex ante equity cost of capital by decreasing tax avoidance.

The next tests focus on the association between tax avoidance and ex ante equity cost of capital when country's legal origin differs, and follows La Porta et al. (1998), the legal origin classification (English common law, French civil law, German civil law and Scandinavian civil law). Given the current global tax competition, firms are more pressured to take advantage of mechanisms to decrease their tax liability, namely: profits shifting (e.g., Dischinger, Knoll, and Riedel (2014)), increase subsidiaries in different jurisdictions (Hope, Ma, & Thomas, 2013), location decisions of new firms (e.g., Djankov, Ganser, McLiesh, Ramalho, and Shleifer (2010)), to name just a few. For instance, Dischinger, Knoll, and Riedel (2014) find a significant flow of income shifted from subsidiaries to parent firms when parent firms face lower corporate income tax rates. Results from this additional analysis suggest that in English common law countries, the effect of corporate tax avoidance on ex ante equity cost of capital is lower than that in other legal origins.

Our findings make contributions to the literature in the sense that the results regarding the U-shaped relationship between tax avoidance and ex ante equity cost of capital are based on European firms, whereas previous literature focus on US firms (Cook, Moser and Omer, 2015). Moreover, we assess whether the U-shaped relationship holds for different legal origins amongst European countries, and find out that such a relation may vary, according to countries' legal origin.

The remainder of the study is organized as follows: Section 2 presents the literature review. Section 3 presents the research hypotheses, the data and empirical methods used to perform the analyses. Section 4 reports our main results, and Section 5 concludes the study.

Literature Review and Hypotheses Development

Corporate Tax Avoidance and Cost of Capital

The academic literature has been paying little focus on the relation between corporate tax avoidance and cost of capital, despite the significant literature focussed on capital structure.

Recently, several authors have explored several factors that may be related with the association between tax avoidance and cost of capital, such as tax risk (Moore, 2012), investors' perception of tax avoidance (Cook, Omar and Moser, 2015), equity risk incentives (Rego and Wilson, 2012), reputational costs (Gallemore et al., 2014; Graham et al., 2014), tax authority enforcement (El Ghoul et al., 2011), amongst others.

Moore (2012), in a US-based study provide fairly compelling empirical evidence that the relationship between tax risk and firm value is concave and there is an optimal level of tax risk, leading investors to value tax risk, as long as the tax savings outweigh the tax costs. From the optimal level onwards, investors require a higher rate of return to engage in risky tax position when it comes to uncertain outcomes that may harm firm value. Similar intuition can be found when considering investor's expectations towards an optimal level of corporate tax avoidance. Cook, Omar and Moser (2015) demonstrate that firms try to coordinate their actual levels of tax avoidance with investors' expectations. The authors also find that the investors' perception of tax avoidance changes with the level of tax avoidance, as they are concerned about the expected costs of increasing tax avoidance from favourable, to unfavourable, as the level of tax avoidance increases.

Following Scholes et al.'s (2009) framework, Kim et al. (2016) find evidence that firms actually tend to converge to a certain level of tax avoidance, regardless of their initial level of tax avoidance being above or below their target level of tax avoidance. Kim et al. (2016) infer that firms with a low level of tax avoidance engage in additional tax avoidance at a faster rate when compared to the rate at which high tax avoidance firms diminish their tax avoidance. One can understand that firms face a clear trade-off when moving towards optimal levels of tax avoidance.

Rego and Wilson (2012) infer that equity risk incentives and higher levels of corporate tax planning are positively associated, due to investors' perception of risky tax positions as a valuable strategy to achieve higher stock return volatility which allows for an increase of stock option portfolio values. Recently, Hutchens and Rego (2015) study the relationship between risky tax positions and firm value, and suggest that more aggressive forms of tax avoidance are associated with greater tax risk, which leads to a higher cost of equity capital. The authors concluded that investors will demand a higher rate of return to engage in uncertain tax positions.

Non-tax costs affect firm's tax avoidance strategies (Scholes et al., 2009), which includes reputational penalties that may justify why some tax avoidance strategies are penalised by investors. Gallemore et al. (2014) provide evidence that there are no relevant reputational penalties due to tax-sheltering participation, after analysing a sample of firms publicly identified as tax-shelter users. Regarding reputational costs due to tax planning, Graham et al. (2014) suggest that reputational costs are a determinant factor for firms that consider engaging in tax avoidance. Their findings provide evidence that the unfavourable impact of reputational concerns constrain the extent to which firms undertake tax avoidance. Ayers et al. (2009) and Graham et al.'s (2014) findings are also consistent with the reasoning concerning the right side of the proposed U-shaped association between tax avoidance and ex ante equity cost of capital, as cost of capital is increasing in tax

avoidance. According to Ayers et al. (2009), an increase of tax avoidance leads to greater information asymmetry, which results in higher cost of capital. Graham et al.'s (2014) results indicate that, from an optimal level of tax avoidance onwards, cost of capital is increasing in tax avoidance.

In the Literature, there are findings inconsistent with those of Cook, Omar and Moser (2015) and Moore (2012). For instance, Sikes and Verrecchia (2014) demonstrate that a negative externality occurs throughout the whole economy when a relevant percentage of firms in an economy undertake tax avoidance – this will result in higher covariance risk between the market cash flows and a firm cash flow, which leads to a higher cost of capital for all firms in the economy. These results are reasonable, regardless of whether each specific firm does, or does not engage in tax avoidance. Sikes (2016) perceives a negative financial externality subsequent to tax avoidance embracement. There is an overall increase in cost of capital as more firms engage in tax avoidance, even for firms that do not engage in tax avoidance. They focus on the risk partition between firms and the government through taxation. Despite the contributions of Sikes and Verrecchia (2014) and Sikes (2016), we predict for Europe a non-linear, convex relationship between ex ante equity cost of capital and corporate tax avoidance, in line with Moore (2012), Cook, Omar and Moser (2015), and Kim et al. (2016) findings. Therefore, the following research hypotheses are tested:

Hypothesis 1: The ex ante equity cost of capital is negatively associated with corporate tax avoidance for firms engaged in lower levels of corporate tax avoidance.

Hypothesis 2: The ex ante equity cost of capital is positively associated with corporate tax avoidance for firms engaged in greater corporate tax avoidance.

The Role of Institutional Characteristics

For the fiscal years starting after January 1st 2005, the European Union (EU) Parliament adopted the International Financial Reporting Standards (IFRS), which require consolidated and simple accounts for all EU listed firms. The adoption of IFRS aims to contribute for convergence and harmonisation among European firms, and to allow for an improvement in the comparability of financial statements across countries, as well as in accounting quality. Despite the adoption, differences still persist across countries in terms of accounting practices, which inevitably are linked to tax issues. Thus, we explore the effect of legal origin on the association between tax avoidance and ex ante equity cost of capital.

Soderstrom and Sun (2007) claim that information asymmetry may not decrease when firms prepare their financial statements according to the IFRS, rather than to their domestic accounting standards. Information asymmetry affects accounting quality, whereas a country's legal and political system has an indirect impact on both accounting quality and tax avoidance. Legal origin has been widely studied in the literature after the seminal work of La Porta et al. (1998). In the view of Soderstrom and Sun (2007), legal origin indirectly affects tax systems, such as in common law

countries, where financial reporting aims primarily to reduce information asymmetry, which may well implicitly affect investors' perceptions and the cost of capital. Kramer and Lipatov (2012) find that corporate tax rates exert a positive effect on shareholders' value in civil law countries, and have a negative effect in common law countries. There is not, however, clarification as to whether the effect on shareholders' value is due to increases in cash flows, or in the required return, or both. The existent literature is not clear enough to distinguish the features of each legal origin in the relation between tax avoidance and ex ante equity cost of capital. From Soderstrom and Sun's (2007) work we infer that the effect of corporate tax avoidance on ex ante equity cost of capital may be lower regarding the role of information asymmetry. This inference is purely exploratory, thus we address the following research hypothesis:

Hypothesis 3: The association between tax avoidance and ex ante equity cost of capital does not varies in English common law countries.

Corporate Tax Avoidance and Cost of Capital: Other Effects

To control for the relationship between tax avoidance and equity cost of capital, there are several contributions in the Literature that should be highlighted. For instance, there is evidence that investors may perceive positively aggressive tax reporting. El Ghoul et al. (2011) find that there is a negative association between tax authority enforcement and cost of equity capital as an increase in tax authority enforcement will generate a decrease in the cost of equity, thus increasing firm value. Most recently, Klassen, Lisowsky and Mescall (2016) study the association between the tax preparer type and firms' tax aggressiveness, considering the auditor, external non-auditor, and internal tax department as possible parties responsible for a firm's tax compliance function. The authors find that firms require more aggressive tax positions when the party responsible for the firm's tax compliance function is an external non-auditor or the internal tax department.

Cook et al. (2008) examine whether managers differ investments in tax planning in order to decrease their effective tax rates. That is to say, if a firm's earnings are managed through changes in their effective tax rates, mainly between the third and the fourth quarter. The authors study the effect of auditor-provided tax services and find that the amount of tax fees paid to external auditors is directly related to a significant decrease in the effective tax rates between the two quarters.

A firm with greater accounting information quality is able to assess its cash flows more efficiently, which increases information certainty and allows for a decrease in the cost of equity capital. Allen et al. (2016) and Chen and Lin (2014) investigate the effect of financial analysts coverage on corporate tax avoidance. The evidence for the negative impact of analyst coverage on tax avoidance is clearer for firms that combine distinct factors such as weaker corporate governance, opaque information environments and greater reputational concerns. Chen and Lin (2014) find that firms which experience an exogenous reduction in the number of analysts following the firm, engage in greater tax avoidance when compared to firms that do not face this exogenous reduction of analyst coverage. Allen et al. (2016) demonstrate that the negative effect of financial analysts on corporate

tax avoidance suggests that financial analysts' monitoring constrains corporate tax avoidance – financial analysts diffuse firm's private information to market participants, which potentially increases the probability of publicly revealing a firm's tax avoidance conduct - such that firms that are monitored by financial analysts tend to undertake less aggressive tax avoidance positions.

Dhaliwal et al. (2006) demonstrate that “the implied cost of equity capital is increasing in leverage”, which means that leverage has a positive effect in the cost of equity as long as we are at an optimal level where the after-tax return on equity outweighs the after-tax return on debt. On the one hand, “the effect of leverage on the firm's cost of equity is decreasing in the firm's tax benefit from debt” (Dhaliwal et al. 2006), such that the corporate taxes have a negative impact on the risk premium from leverage, as long as we are at an optimal level in which the after-tax return on equity outweighs the after-tax return on debt – thus, as the corporate tax benefit from the interest expense deduction increases, the effect of leverage on cost of equity decreases, the tax benefit from debt allows for a decrease in the cost, if equity and increases market value.

Data and Research Design

Sample Selection

The empirical analysis uses an unbalanced dataset that comes mainly from Thomson Reuters Eikon, including I/B/E/S. Sample selection initiated with data from all listed firms on the principal stock indexes of all European countries. The initial sample of 2,652 firms was narrowed down after the exclusion of financial firms, and firms with insufficient data to calculate the tax avoidance measures, the measure of ex ante equity cost of capital, and control variables. The final sample comprises 4,630 firm-year observations of 1,498 firms listed on the stock exchanges of 24 European countries. The period of study is from 2005 to 2014, covering the whole period of accounting harmonisation in Europe, as well as the financial crisis. Table 2 sets out the sample composition by country.

Measuring Ex Ante Equity Cost of Capital

Following Cook, Moser and Omer (2015), *Equity Cost of Capital* is generated as a measure of ex ante equity cost of capital, as defined in Easton (2004). The measure aims to attain a forecast for ex ante equity cost of capital, and is calculated as of December 31st, at the close of the fiscal year:

$$P_t = \frac{\text{ForecastEPS}_{t+2} - \text{ForecastEPS}_{t+1}}{\text{EquityCostCapital}^2} \quad (1)$$

in which P_t is the price of the stock in December of year t ; *ForecastEPS* is forecasted earnings per share for future period $t+1$, and $t+2$. *Equity Cost of Capital* is the measure of estimated ex ante equity cost of capital for $t+1$. Equation (1) is adapted to obtain the estimation of *Equity Cost of Capital*:

$$\text{EquityCostCapital} = \sqrt{\frac{\text{ForecastEPS}_{t+2} - \text{ForecastEPS}_{t+1}}{P_t}} \quad (2)$$

Easton (2004) demonstrates that in order to obtain *Equity Cost of Capital*, which is the solution of this quadratic equation, one must rely on the observed prices and forecasts of earnings and dividends. Earnings forecasts are not available for many firms because several firms do not have analysts' coverage. Moreover, equation (2) cannot be solved when $ForecastEPS_{t+1}$ is greater than $ForecastEPS_{t+2}$. As investment decisions have to be made beforehand of knowing all of the significant information, investors must rely on expected or forecasted cost of capital instead of the actual cost of capital. We use the ex ante approach because the ex post cost of capital would imply a world of more certainty.

In all estimations, the dependent variable is *Equity Cost of Capital*. However, to assess the non-linear, convex relationship between ex ante equity cost of capital and tax avoidance, our main independent variable of interest, we split our sample to distinguish firms with: (i) lower tax avoidance; (ii) medium level of tax avoidance, and; (iii) higher tax avoidance.

Measuring Tax Avoidance

TaxAv comprises the measures of tax avoidance: either cash effective tax rate (*CETR*), or book effective tax rate (*BETR*). Cash effective tax rate reveals the actual cash tax payments to the tax administration for a firm's certain level of pre-tax income. Following Dyreng et al. (2008), *CETR* is computed as cash taxes paid each period divided by the corresponding pre-tax book income. *CETR* is used instead of its long-run version (*LCETR*), as we have an unbalanced sample in this study, so it is difficult to track the cash effective tax rate over a long time period for several firms. The second measure, a firm's book effective tax rate (*BETR*), is computed as tax expense divided by pre-tax book income. As higher *CETR* and *BETR* prompt lower levels of tax avoidance, *CETR* and *BETR* is multiplied by -1, such that tax avoidance is increasing in *CETR* and *BETR* – this measure varies in the range -1 and 0.

Research Design

This section describes the conducted research design. To infer the association between tax avoidance and ex ante equity cost of capital and to test the veracity of our research hypotheses, the following Ordinary Least Squares regression model with robust standard errors was estimated:

$$\begin{aligned}
 EquityCostCapital_{i,c,t+1} = & \alpha + \beta_1 TaxAv_{i,c,t} + \beta_2 LnBMRatio_{i,c,t} + \beta_3 B_mkt_{i,c,t} + \\
 & \beta_4 B_smb_{i,c,t} + \beta_5 B_hml_{i,c,t} + \beta_6 Leverage_{i,c,t} + \beta_7 PPEGT_{i,c,t} + \\
 & \beta_8 Capex_{i,c,t} + \beta_9 Forecast_Bias_{i,c,t} + \beta_{10} Analysts_{i,c,t} + \beta_{11} TA_{i,c,t} + \\
 & Industry + Country + Year + e_{i,c,t}
 \end{aligned} \tag{3}$$

The dependent variable *Equity Cost of Capital* is the ex ante equity cost of capital from Easton (2004), per firm i , listed in country c , for the year $t+1$, as described in section 0. We conjecture that this variable is affected by tax avoidance, measured as either *CETR* or *BETR*. We predict a U-shaped relationship between ex ante equity cost of capital and tax avoidance (measured by the coefficient β_1), suggesting that when firms with low levels of tax avoidance engage in additional corporate tax avoidance, their ex ante equity cost of capital decreases (H1); whereas, when firms with high levels of tax avoidance engage in more tax avoidance, firms' ex ante equity cost of capital increases (H2).

As prior literature endorses, several variables may affect *Equity Cost of Capital*. As in Gebhardt et al.'s (2001) work, a proxy for the log of the book-to-market ratio (*LnBMRatio*) is included. The three Fama and French (1993) factors (*BMKT*, *BSMB* and *BHML*) are included in order to control for firm's risk. As prior literature suggests that firms comprising higher risk usually have greater ex ante equity cost of capital, we expect positive coefficients for the three factors. The three factors were estimated per each firm and year, using the following OLS model:

$$R_i - R_f = b_i(R_m - R_f) + s_iSMB + h_iHML + \epsilon_i \quad (4)$$

where, R_i is the stock rate of return, R_f is the risk free rate of return and R_m is the market portfolio's rate of monthly return. *SMB* (small minus big) measures the spread in returns between small capitalisation over large capitalisation firms, whereas *HML* (high minus low book-to-market ratio) measures value stocks over growth stocks. Data on all dependent variables in equation (4) was obtained from Kenneth R. French - Data Library, which was computed based on portfolios of companies from 16 European countries.² R_i was obtained from Thomson Reuters Eikon. We estimated the three Fama and French (1993) factors for all firms in the sample, per month, grouped monthly data (by mean) per year, and added to Equation (3) the coefficients b_i , s_i , and h_i , which were further labelled as B_{MKT} , B_{SMB} , and B_{HML} , respectively.

Following Dhaliwal et al. (2006), we control for leverage (*Leverage*) which is defined as long-term debt scaled by total assets. The trade-off theory on capital structure endorses that a U-shaped relation exists between leverage and cost of capital Modigliani and Miller (1963), depending on whether the level of leverage is higher or lower than an optimal level. Consequently, we do not conjecture a signal for the variable *Leverage*. In addition, to control for tax avoidance due to depreciation deductions we include *PPEGT*, gross property plant and equipment divided by total assets. Following Hutchens and Rego (2015), we comprise control variables for analyst forecast bias (*Forecast_Bias*) and expect positive coefficients for *Forecast_Bias*, as higher analyst forecast bias gives rise to greater ex ante equity cost of capital. As pointed out by Allen et al. (2016) and Chen and Lin (2014), the number of analysts following firms play an important role on tax avoidance and, consequently, in the accuracy of estimated ex ante equity cost of capital. Thus, the variable *Analyst* captures the number of analysts providing earnings forecasts. Total Accruals (*TA*) aims to capture

² Data was taken from the website http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.

tax avoidance arising due to earnings management, and it is computed as earnings before taxes minus operational cash flow, scaled by lagged total assets.

To control for absent country-level factors, we apply a fixed effect specification for country, industry and year. In order to infer these cross-country differences, we perform a more comprehensive analysis concerning the effect of legal origin on the association between tax avoidance and cost of capital, by grouping countries according to their legal origin following La Porta et al. (1998). To assess the presence of multicollinearity we conducted the Variance Inflation Factor (VIF) test. Typically, a VIF value above 10 is considered a signal of a multicollinearity problem. In all estimations in this paper there are no evidence of multicollinearity amongst predictors, as the average of the VIF values for all estimations varies between 2.03 and 2.60. We also assessed for differences in variance error terms across observations, in order to test for homoscedasticity of errors. Nevertheless, as presented in all Tables, they are robust standard errors. Furthermore, statistical tests were performed to assess for normality of the error distribution.

Descriptive statistics

Table 2 presents descriptive statistics for the variables used in the empirical model. The mean (median) firm in the sample exhibits an ex ante *Equity Cost of Capital* of 11.1 percent (10.0 percent), congruous with Easton (2004). *Equity Cost of Capital* varies from 0 to 36.7 percent and presents a standard deviation of 0.078. For the entire sample of 4,630 observations, we find that the mean (median) firm has a cash effective tax rate (*CETR*) of -29.3 percent (-26.4 percent), while the mean (median) book effective tax rate (*BETR*) is of -18.6 percent (-13.9 percent). The correlation matrix (not reported) suggest that *Equity Cost of Capital* is significantly correlated with *BETR* (corr: -0.057; t-stat -2.22), while the correlation with *CETR* is also negative (corr: -0.037; t-stat -1.22) but not statistically significant at conventional levels, perceivably due to the proposed non-linear association between tax avoidance and ex ante equity cost of capital.

Empirical Results

Ex ante Equity Cost of Capital and Tax Avoidance

In Panels A and B of Table 3 we investigate whether ex ante equity cost of capital varies with the level of tax avoidance. Hypotheses 1 and 2 forecast that the relationship between tax avoidance and ex ante equity cost of capital varies across the corporate tax avoidance distribution. Hence, to test these hypotheses, we tripartite our sample into terciles, and analyse the association between tax avoidance and ex ante equity cost of capital for low, medium and high levels of tax avoidance.

In both Panels the dependent variable is *Equity Cost of Capital*. In Column (1) we include Model 3 and add two interaction terms, both of which signalling different levels of tax avoidance. *CETR Low* is firstly computed as a dummy variable taking the value one for firms engaged in lower tax avoidance (first tercile), and is then interacted with *CETR*. Therefore, *CETR Low* takes the value of

CETR for less tax avoidance firms, and zero otherwise. The variable *CETR High* follows similar procedure, although comprises only firms engaged in greater tax avoidance (third tercile). The second column of Table 3 corresponds to firms engaged in lower levels of tax avoidance, the third column corresponds to medium tax avoidance, and Column (4) corresponds to a subsample of firms which present higher levels of corporate tax avoidance. In Panel A the measure of tax avoidance is *CETR* whereas in Panel B is *BETR*.

Results in Column (1) support our first research hypothesis, which states that the ex ante equity cost of capital decreases when firms engaged in lower corporate tax avoidance increase their level of corporate tax avoidance. Panel A exhibits a negative coefficient for lower avoidance *CETR* (column 2) and a significantly positive coefficient for higher avoidance *CETR* (Column 4). The negative sign for *CETR* in Column (2) indicates that the ex ante equity cost of capital decreases as tax avoidance increases, for firms with low levels of tax avoidance. The positive signal for *CETR* in Column (4) means that the ex ante equity cost of capital is increasing in tax avoidance for firms with high levels of tax avoidance. These results provide strong support for both the first and the second research hypotheses, being consistent with Moore (2012) and Cook, Omar and Moser (2015).

Panel B presents a significantly negative coefficient for low *BETR* and a significantly positive coefficient for high *BETR*. Consistent with the results for *CETR*, the negative sign for low avoidance *BETR* indicates that the ex ante equity cost of capital decreases when low avoidance *BETR* increases, for firms undertaking low levels of tax avoidance. The positive sign for *BETR* (Column 4) means ex ante equity cost of capital is increasing in tax avoidance for firms undertaking high levels of tax avoidance. Consistent with Hypotheses 1 and 2, our findings suggest that investors perceive tax avoidance differently at different levels of tax avoidance.

Controls for Ex Ante Equity Cost of Capital

In both Panels, *LnBMRatio* presents significant and positive coefficients, suggesting that firms that reveal both greater growth opportunities often exhibit higher ex ante equity cost of capital (Gebhardt et al., 2001). The coefficients on the three Fama and French (1993) factor are positive and statistically significant for most specifications, as expected, revealing that firms that bear greater risk exhibit higher ex ante equity cost of capital. The coefficient on *Leverage* is generally positive, which suggests that firms with higher leverage exhibit higher ex ante equity cost of capital.

As suggested by Hutchens and Rego (2015) insights that lower analysts' forecasts errors decrease the required cost of capital, *Forecast_Bias* exhibits positive and statistically significant coefficients. The coefficients on the variable *Analysts* are generally negative, which suggests that there is a negative association between ex ante equity cost of capital and the number of analysts providing earnings forecasts. That is to say, the ex ante equity cost of capital decreases as the number of analysts providing earnings forecasts increases. Allen et al.'s (2016) findings are consistent with that of ours – more analysts following decrease information asymmetry, and thus the implied cost of equity capital.

The Role of Legal Origin

In Panels A and B of Table 4 we investigate whether countries' legal origin has an impact on the effect exerted by tax avoidance on the ex ante equity cost of capital, considering low and high levels of tax avoidance separately. Hypothesis 3 forecasts that the association between tax avoidance and ex ante equity cost of capital does not vary in legal origins based on English common law, compared with other legal origins (French civil law, German civil law and Scandinavian civil law).

In both Panels, *English* takes the value one for firms headquartered in countries with English common law legal origin, and zero otherwise. Firms based in countries using English common law present a negative coefficient for low levels of avoidance and for higher levels of tax avoidance the coefficient is positive. Results suggest that in English common law countries the effect of corporate tax avoidance on ex ante equity cost of capital is lower than that in other legal origins. That is to say, firms decrease cost of capital when they increase the level of tax avoidance towards an optimal level, although the decrease is less accentuate in countries based on English common law. On the other hand, when the level of tax avoidance increases and diverges from the optimal level, the increase in cost of capital derived from tax avoidance strategies is attenuated for English common law countries compared to countries with different legal origins. Collectively, these findings indicate that a country's institutional characteristics may change the effect exerted by tax avoidance in the ex ante equity cost of capital, which does not provide support for the third and exploratory research hypothesis.

Robustness Check

We carry out a battery of robustness checks, which all corroborate the original findings. Despite the fixed effect specification per country, year, and industry, the main estimations does not consider country-specific controls. Therefore, a measure of countries' culture (defined as *Trust* in politicians) is applied in the base estimation as control at country level. *Trust* in politicians is, according to Robinson and Slemrod (2012), the most coherent and crucial non-tax rate determinant of the variability amongst tax systems. For parsimony, these results are not reported as they are very similar to the main results in Table 3.

One potential concern about our setting is the potential influence of the financial crisis from 2008 onwards. We perform Model (3) with the inclusion of an interaction term. *Years₂₀₀₅₋₂₀₀₇* is a dummy variable taking the value one for the years 2005 through to 2007, and zero otherwise. Results suggest that on the run up to the financial crisis the non-linear relationship between tax avoidance and ex ante equity cost of capital was not affected. Nevertheless, the fixed effect specification per year delimited the variability of our estimations per year. We relaxed this assumption and as additional analysis the fixed effect specification per year was removed. In Table 5 we perform Model (3), with the inclusion of the interaction term and consider a fixed effect specification only per country and industry. In Panel A, the measure of corporate tax avoidance is *CETR*, while *BETR* is

used in Panel B. Overall, we confirm the non-linear relationship between corporate tax avoidance and ex ante equity cost of capital, especially for firms engaged in lower tax avoidance (Columns 1 and 2). Nevertheless, the interaction term in both Panels suggest that on the run up to the financial crisis the effect of tax avoidance on ex ante equity cost of capital was lower, especially for firms engaged in less tax avoidance. The intuition is that low tax avoider firms benefited more from increases in tax avoidance in the period 2008-2014. For firms other than low tax avoiders, the effect was also lower although with ambiguous statistical significance. Our conclusions fit with existent literature that suggest an increase in the cost of capital after the fall of markets in 2008 (e.g., King (2009) and Mokhova (2011)).

Based on the assumption that our main variable of interest (tax avoidance) is endogenous, we might be looking at data through a biased perspective. In fact, corporate tax avoidance might be driven by non-rate aspects of tax systems, such as complexity. Consequently, corporate tax avoidance might be endogenous if, in reality, such strategies accounted for non-rate aspects of tax systems. To control for potential endogeneity, Model (3) is performed through a two-stage least square (2SLS) approach. CETR (or BETR) is the endogenous variable and as instrumental variables (IV) are used two variables from Robinson and Slemrod (2012), namely: a procedural measure of tax administration, and an enforcement measure (Table 1 for definitions). Both variables are the principal components which combine five tax system measures each (other than tax rates).³ The Procedural measure comprises the principal component of five measures that capture government's ability to compute or collect income from taxpayers, while Enforcement is the principal component of five measures that "reflect the extent to which revenue bodies are empowered to fulfil their objectives of accurately assessing tax liabilities and collecting revenue" (Robinson and Slemrod, 2012).

The variable that proxies for the maximum penalty for failure to correctly reported tax liability which is included in the enforcement measure was excluded due to missing data for several countries. Thus, we re-estimated the principal components with this exclusion and the index properties were not significantly changeable, as the index obtained by us with the same procedure of Robinson and Slemrod (2012) exhibits very strong correlation with the index originally computed by the authors (corr: 0.993; t-stat: 211.6).

Table 6 summarises the estimation of the 2SLS approach using two instruments: Procedural and Enforcement. In Columns (1) and (2) we estimate the effect of tax avoidance on ex ante equity cost of capital for firms engaged in less tax avoidance, while estimations for firms engaged in greater tax avoidance are presented in the remaining columns. The 2SLS approach reinforces our results for firms engaged in lower levels of corporate tax avoidance.

³ The data comes from Robinson and Slemrod's (2012) work, which is primarily sourced from the OECD, Bureau International Database, US Census, and the Fraser Institute.

Conclusion

Following the significant and recent contributions of Moore (2012), Cook, Omar and Moser (2015), and Kim et al. (2016), in order to understand the longstanding relationship between corporate tax avoidance and ex ante equity cost of capital for the US, this study examines the association between corporate tax avoidance and ex ante equity cost of capital in Europe.

Our results suggest that investors' perception of tax avoidance appear to change at different levels of tax avoidance. We provide evidence that as tax avoidance increases from low avoidance to high avoidance, the ex ante equity cost of capital appears to decrease, which indicates that investors recognize the benefits of tax avoidance to surpass the costs. On the other hand, when firms that undertake high levels of tax avoidance engage in greater tax avoidance, the ex ante equity cost of capital appears to increase, indicating that investors perceive the costs of tax avoidance to surpass the benefits. These results imply that the relationship between tax avoidance and ex ante equity cost of capital is U-shaped, as suggested by Cook, Omar and Moser (2015).

Additionally, we investigate whether a countries' institutional characteristics (legal origin) might change the effect exerted by tax avoidance in the ex ante equity cost of capital, conjecturing that the association between tax avoidance and ex ante equity cost of capital may well vary with countries' legal origin (English common law, French civil law, German civil law and Scandinavian civil law). Our results indicate that a country's institutional characteristics change the effect exerted by tax avoidance in the ex ante equity cost of capital, which is lower for English common law countries, compared to countries with other legal origins.

Our findings make a contribution to the literature in the sense that the results regarding the U-shaped relationship between tax avoidance and ex ante equity cost of capital are based on European firms whereas previous literature focus on US firms. Moreover, we try to understand whether such relation varies with countries legal origin, although we consider that more research is needed on this topic. Despite the lack of data for the analysis of the role of legal origin, resulting in limited conclusions, we believe this topic require further research. Moreover, a country specific study including both public and private firms may yield important findings to current debate on this topic.

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Appendixes

| Variable | Source | Definition |
|--|--------|--|
| <i>Equity Cost of Capital</i> | a | Ex ante equity cost of capital from Easton (2004), calculated as of December 31 following the close of the fiscal year. |
| <i>TaxAv</i> | a | Cash effective tax rate (<i>CETR</i>), Book effective tax rate (<i>BETR</i>). |
| <i>CETR</i> | a | <i>CETR</i> is computed as cash taxes paid each period divided by the corresponding pre-tax book income. All observations with negative cash taxes paid or negative pre-tax income are excluded. <i>CETR</i> with observations higher than 1 or lower than 0 are excluded. <i>CETR</i> is multiplied by -1, such that tax avoidance is increasing in <i>CETR</i> . |
| <i>BETR</i> | a | <i>BETR</i> is computed as tax expense divided by pre-tax book income. All observations with negative tax expense or negative pre-tax income are excluded. <i>BETR</i> is multiplied by -1, so that tax avoidance is increasing in <i>BETR</i> . |
| <i>LnMVE</i> | a | Log of market value of equity, in which market value of equity is derived from year end stock price. |
| <i>LnBMRatio</i> | a | The natural log of the book-to-market ratio is computed as book value of equity divided by market value of equity. |
| <i>B_{MKT}</i> , <i>B_{HML}</i> , and <i>B_{SMB}</i> | b | The Fama and French (1993) risk factors are computed by regressing a firm's annual stock returns. See chapter 3.4. |
| <i>PPEGT</i> | a | Gross Property Plant and Equipment (<i>PPEGT</i>) scaled by lagged total assets. |
| <i>Leverage</i> | a | Financial leverage, measured as long-term debt over lagged total assets. |
| <i>Capex</i> | a | Total capital expenditures for fiscal year (<i>Capex</i>), scaled by lagged total assets. |
| <i>Forecast_Bias</i> | a | An estimate of IBES analysts EPS forecast bias, calculated as the prior year earnings per share forecast from IBES minus this year's net income, scaled by lagged total assets. |
| <i>Analysts</i> | a | The variable <i>Analysts</i> captures the number of analysts providing earnings forecasts. |
| <i>TA</i> | a | Total Accruals, aims to capture tax avoidance arising due to earnings management, it is computed as earnings before taxes minus operational cash flow, scaled lagged total assets. |
| <i>Procedural (IV)</i> | c | Procedural measure of tax administration, which consists on the principal component of five procedural measures of tax systems, namely: self-assess, withhold, withhold type, report, and match. |
| <i>Enforcement (IV)</i> | c | Enforcement measure, which consists on the principal component of five enforcement measures of tax systems, namely: collect, bank, verify, penalty, and coverage. |
| <i>Trust</i> | - | Cultural variable concerning trust in politicians, following Robinson and Slemrod (2012). |
| <i>Legal Origin</i> | - | Legal origin following La Porta et al. (1998) definition. |

^a Thomson Reuters DataStream / Eikon and own calculations

^b Fama and French (93): http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/Data_Library/f-f_factors.html

^c Robinson and Slemrod (2012)

Table 1: Variable Definitions

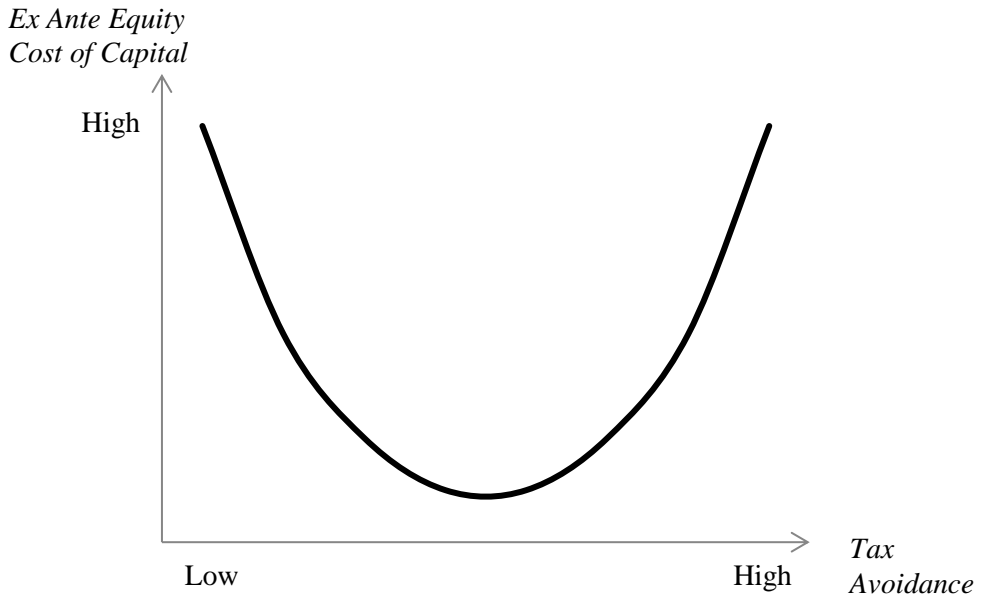


Figure 1: U-shaped relation between corporate tax avoidance and ex ante equity cost of capital

Notes for Figure 1:

The U-shaped association between tax avoidance and ex ante equity cost of capital is presented in the figure below. It states that when firms with a low level of tax avoidance engage in additional tax avoidance, the firm's ex ante equity cost of capital decreases towards an optimal level. On the other hand, when firms with a high level of tax avoidance engage in greater corporate tax avoidance, the firm's ex ante equity cost of capital increases.

| Panel A: Firm Level Variables | | | | | | | | |
|--------------------------------------|----------|------------|---------------------------------|---------------------------------|---------------------------------|------------|-------------|--------------------|
| Variable | N | Min | 25th Pctl | 50th Pctl | 75th Pctl | Max | Mean | Std Dev |
| Equity Cost of Capital | 4,630 | 0.000 | 0.053 | 0.100 | 0.155 | 0.368 | 0.111 | 0.078 |
| CETR | 3,612 | -0.999 | -0.392 | -0.264 | -0.155 | 0.000 | -0.293 | 0.194 |
| BETR | 4,630 | -0.997 | -0.250 | -0.139 | -0.066 | 0.000 | -0.186 | 0.177 |
| LnBMRatio | 4,630 | -7.676 | -1.265 | -0.721 | -0.204 | 2.752 | -0.770 | 0.901 |
| B _{MKT} | 4,630 | -0.081 | 0.001 | 0.006 | 0.011 | 0.200 | 0.007 | 0.010 |
| B _{SMB} | 4,630 | -0.110 | -0.007 | 0.003 | 0.014 | 0.270 | 0.004 | 0.020 |
| B _{HML} | 4,630 | -0.275 | -0.011 | 0.000 | 0.012 | 0.227 | 0.001 | 0.026 |
| Leverage | 4,630 | 0.000 | 0.019 | 0.110 | 0.233 | 0.888 | 0.147 | 0.143 |
| PPEGT | 4,630 | -0.180 | 0.044 | 0.142 | 0.314 | 1.306 | 0.208 | 0.205 |
| Capex | 4,630 | -0.024 | 0.016 | 0.034 | 0.061 | 0.423 | 0.457 | 0.045 |
| Forecast_Bias | 4,630 | -0.651 | -0.082 | -0.048 | -0.024 | 0.880 | -0.062 | 0.066 |
| Analysts | 4,630 | 1.000 | 3.000 | 7.000 | 16.00 | 44.00 | 10.37 | 9.312 |
| TA | 4,630 | -0.665 | -0.044 | -0.010 | 0.026 | 79.16 | 0.011 | 1.166 |

| Panel B: Sample Composition Per Country | |
|--|--------------|
| Austria | 98 |
| Belgium | 142 |
| Bulgaria | 9 |
| Croatia | 12 |
| Czech Republic | 16 |
| Denmark | 145 |
| Finland | 175 |
| France | 630 |
| Germany | 668 |
| Greece | 94 |
| Hungary | 17 |
| Italy | 323 |
| Luxembourg | 36 |
| Netherlands | 182 |
| Norway | 188 |
| Poland | 210 |
| Portugal | 46 |
| Romania | 15 |
| Slovenia | 21 |
| Spain | 206 |
| Sweden | 419 |
| Switzerland | 305 |
| Ukraine | 97 |
| United Kingdom | 576 |
| Total | 4,630 |

Table 2: Descriptive Statistics and Sample Composition

| | | Dependent (<i>Equity Cost of Capital</i>) | | | |
|----------------------|-------|---|----------------------|----------------------|----------------------|
| | | All Sample | Low Tax Avoidance | Medium Tax Avoidance | High Tax Avoidance |
| <i>Expected Sign</i> | | (1) | (2) | (3) | (4) |
| CETR | -/!/+ | | -0.024* (0.013) | -0.002 (0.039) | 0.070* (0.037) |
| CETR Low | - | -0.008* (0.005) | | | |
| CETR High | + | -0.015 (0.020) | | | |
| LnBMRatio | + | 0.011*** (0.002) | 0.010*** (0.003) | 0.012*** (0.003) | 0.009*** (0.003) |
| B _{MKT} | + | 0.416*** (0.151) | 0.591** (0.241) | 0.041 (0.241) | 0.441 (0.268) |
| B _{SMB} | + | 0.165*** (0.063) | 0.240** (0.115) | 0.025 (0.121) | 0.176* (0.097) |
| B _{HML} | + | 0.178*** (0.061) | 0.256*** (0.097) | 0.044 (0.112) | 0.150 (0.113) |
| Leverage | ? | -0.007 (0.008) | 0.008 (0.015) | 0.005 (0.017) | -0.034** (0.015) |
| PPEGT | ? | -0.001 (0.007) | -0.030** (0.015) | -0.016 (0.014) | 0.021* (0.011) |
| Capex | - | -0.058** (0.029) | 0.060 (0.064) | -0.059 (0.063) | -0.131*** (0.038) |
| Forecast_Bias | + | 0.078*** (0.022) | 0.088* (0.046) | 0.038 (0.043) | 0.023 (0.035) |
| Analysts | - | -0.001*** (0.000) | -0.002*** (0.000) | -0.001*** (0.000) | -0.001*** (0.000) |
| TA | ? | 0.002*** (0.000) | -0.033 (0.034) | -0.061* (0.034) | 0.002*** (0.000) |
| Constant | | 0.137*** (0.009) | 0.119*** (0.017) | 0.148*** (0.019) | 0.148*** (0.017) |
| Fixed Effects: | | | | | |
| Year | | YES | YES | YES | YES |
| Country | | YES | YES | YES | YES |
| Industry | | YES | YES | YES | YES |
| Observations | | 3,653 | 1,238 | 1,225 | 1,190 |
| R-squared | | 0.361 | 0.353 | 0.421 | 0.347 |

Table 3: Effect of Tax Avoidance on Ex Ante Equity Cost of Capital

Panel A: CETR as measure of corporate tax avoidance

| | | Dependent (Equity Cost of Capital) | | | |
|------------------|------|------------------------------------|----------------------|----------------------|----------------------|
| | | All Sample | Low Tax Avoidance | Medium Tax Avoidance | High Tax Avoidance |
| Expected Sign | | (1) | (2) | (3) | (4) |
| BETR | -!/+ | | -0.044*** (0.012) | 0.007 (0.045) | 0.055 (0.059) |
| BETR Low | - | -0.029*** (0.006) | | | |
| BETR High | + | 0.000 (0.037) | | | |
| LnBMRatio | + | 0.010*** (0.001) | 0.005* (0.002) | 0.013*** (0.003) | 0.012*** (0.003) |
| B _{MKT} | + | 0.192 (0.130) | 0.075 (0.200) | 0.653*** (0.218) | -0.097 (0.205) |
| B _{SMB} | + | 0.092 (0.057) | 0.076 (0.093) | 0.100 (0.104) | 0.165* (0.097) |
| B _{HML} | + | 0.109** (0.053) | 0.029 (0.083) | 0.204** (0.097) | 0.067 (0.092) |
| Leverage | ? | -0.005 (0.008) | 0.002 (0.014) | 0.005 (0.013) | -0.017 (0.014) |
| PPEGT | ? | 0.002 (0.007) | 0.003 (0.013) | 0.002 (0.012) | -0.008 (0.011) |
| Capex | - | -0.043 (0.029) | -0.068 (0.052) | -0.070 (0.049) | -0.042 (0.048) |
| Forecast_Bias | + | 0.076*** (0.017) | 0.126*** (0.046) | 0.059 (0.038) | 0.063*** (0.022) |
| Analysts | - | -0.001*** (0.000) | -0.002*** (0.000) | -0.001*** (0.000) | -0.002*** (0.000) |
| TA | ? | 0.002*** (0.000) | -0.031 (0.029) | -0.007 (0.029) | 0.002*** (0.000) |
| Constant | | 0.133*** (0.008) | 0.150*** (0.018) | 0.115*** (0.014) | 0.145*** (0.017) |
| Fixed Effects: | | | | | |
| Year | | YES | YES | YES | YES |
| Country | | YES | YES | YES | YES |
| Industry | | YES | YES | YES | YES |
| Observations | | 4,630 | 1,473 | 1,536 | 1,621 |
| R-squared | | 0.349 | 0.379 | 0.363 | 0.311 |

Table 3: Effect of Tax Avoidance on Ex Ante Equity Cost of Capital

Panel B: BETR as measure of corporate tax avoidance

Notes for Table 3:

$$EquityCostCapital_{i,c,t+1} = \alpha + \beta_1 TaxAv_{i,c,t} + Controls + Industry + Country + Year + e_{i,c,t}$$

The results are from the estimation of model (3), using as tax avoidance (*TaxAv*) measure the variable *CETR* (**Panel A**) and *BETR* (**Panel B**). In both Panels the dependent variable is *Equity Cost of Capital*. The first column comprises the entire sample, while column (2) only includes observations for firms engaged in lower levels of tax avoidance. Column (3) corresponds firms engaged in the “medium” level of tax avoidance, and firms engaged in greater tax avoidance comprise the sample in column (4). Samples in columns (2) through to (4) comprise terciles from the original sample in column (1).

Robust standard errors are presented in parentheses, and the symbols *, **, and *** represent significant levels of 10%, 5%, and 1%, respectively.

| | Expected Sign | Dependent (<i>Equity Cost of Capital</i>) | | |
|--|---------------|---|-----------------------------|---------------------------|
| | | Low Tax Avoidance (1) | Medium Tax Avoidance (2) | High Tax Avoidance (3) |
| Panel A: CETR as measure of corporate tax avoidance | | | | |
| CETR | -!/+ | -0.030** (0.014) | -0.007 (0.045) | 0.081* (0.042) |
| English × CETR | ? | 0.062** (0.026) | 0.038 (0.067) | -0.076 (0.063) |
| Observations | | 1,238 | 1,225 | 1,190 |
| R-squared | | 0.354 | 0.421 | 0.347 |
| Panel B: BETR as measure of corporate tax avoidance | | | | |
| BETR | -!/+ | -0.049*** (0.013) | 0.002 (0.052) | 0.083 (0.064) |
| English × BETR | ? | 0.075*** (0.018) | 0.039 (0.087) | -0.256** (0.129) |
| Observations | | 1,473 | 1,536 | 1,621 |
| R-squared | | 0.380 | 0.363 | 0.312 |
| Fixed Effects (Panels A & B): | | | | |
| Year | | YES | YES | YES |
| Country | | YES | YES | YES |
| Industry | | YES | YES | YES |
| All Controls (Panels A & B) | | YES | YES | YES |

Table 4: The Role of Legal Origin

Notes for Table 4:

$$EquityCostCapital_{i,c,t+1}$$

$$= \alpha + \beta_1 TaxAv_{i,c,t} + \beta_2 English \times TaxAv_{i,c,t} + Controls + Industry + Country + Year + e_{i,c,t}$$

The results are from the estimation of model (3), using as tax avoidance (*TaxAv*) measure the variable *CETR* (**Panel A**) and *BETR* (**Panel B**). *English* takes the value one for firms headquartered in countries with English common law legal origin, and zero otherwise. In both Panels the dependent variable is *Equity Cost of Capital*. The first column comprises observations for firms engaged in lower levels of tax avoidance. Column (2) corresponds firms engaged in the “medium” level of tax avoidance, and firms engaged in greater tax avoidance comprise the sample in column (3). Samples in columns (1) through to (3) comprise terciles from the original sample.

Robust standard errors are presented in parentheses, and the symbols *, **, and *** represent significant levels of 10%, 5%, and 1%, respectively.

| | | Dependent (<i>Equity Cost of Capital</i>) | | | | | |
|--|----------|---|----------------------|----------------------|---------------------|--------------------|--------------------|
| | | Low Tax Avoidance | | Medium Tax Avoidance | | High Tax Avoidance | |
| <i>Expected Sign</i> | | (1) | (2) | (3) | (4) | (5) | (6) |
| Panel A: CETR as measure of corporate tax avoidance | | | | | | | |
| CETR | -/!/?!/+ | -0.033** (0.014) | -0.038*** (0.014) | -0.023 (0.041) | -0.028 (0.042) | 0.064* (0.037) | 0.057 (0.038) |
| Years ₂₀₀₅₋₂₀₀₇ × CETR | ? | | 0.027*** (0.008) | | 0.013 (0.017) | | 0.041 (0.041) |
| Observations | | 1,238 | 1,238 | 1,225 | 1,225 | 1,190 | 1,190 |
| R-squared | | 0.299 | 0.303 | 0.381 | 0.381 | 0.341 | 0.341 |
| Panel B: BETR as measure of corporate tax avoidance | | | | | | | |
| BETR | -/!/?!/+ | -0.046*** (0.012) | -0.048*** (0.012) | -0.002 (0.046) | -0.021 (0.046) | 0.051 (0.059) | 0.015 (0.063) |
| Years ₂₀₀₅₋₂₀₀₇ × BETR | ? | | 0.023* (0.012) | | 0.072*** (0.025) | | 0.184** (0.076) |
| Observations | | 1,473 | 1,473 | 1,536 | 1,536 | 1,621 | 1,621 |
| R-squared | | 0.360 | 0.361 | 0.340 | 0.343 | 0.281 | 0.283 |
| Fixed Effects (Panels A & B): | | | | | | | |
| Year | | NO | NO | NO | NO | NO | NO |
| Country | | YES | YES | YES | YES | YES | YES |
| Industry | | YES | YES | YES | YES | YES | YES |
| All Controls (Panels A & B) | | YES | YES | YES | YES | YES | YES |

Table 5: Effect of Tax Avoidance on Ex Ante Equity Cost of Capital under the Financial Crisis

Notes for Table 5:

$$EquityCostCapital_{i,c,t+1} = \alpha + \beta_1 TaxAv_{i,c,t} + \beta_2 Years_{2005-2007} \times TaxAv_{i,c,t} + Controls + Industry + Country + Year + e_{i,c,t}$$

The results are from the estimation of model (3), using as tax avoidance (*TaxAv*) measure the variable *CETR* (**Panel A**) and *BETR* (**Panel B**). To understand the effect of the financial crises was added the interaction of *CETR* (or *BETR*) with *Years₂₀₀₅₋₂₀₀₇*. The latter variable takes the value one for the period 2005-2007, and zero otherwise. In both Panels the dependent variable is *Equity Cost of Capital*. Columns (1) and (2) includes observations for firms engaged in lower levels of tax avoidance. Column (3) and (4) correspond to firms engaged in the “medium” level of tax avoidance, while firms engaged in greater tax avoidance comprise the sample in columns (5) and (6). The sample for the three levels of corporate tax avoidance consists of terciles from the original sample.

Robust standard errors are presented in parentheses, and the symbols *, **, and *** represent significant levels of 10%, 5%, and 1%, respectively.

| | Expected Sign | Dependent (<i>Equity Cost of Capital</i>) | | | |
|------------------|---------------|---|-----------------------------|---------------------------|-------------------|
| | | Low Tax Avoidance (1) | (2) | High Tax Avoidance (3) | (4) |
| CETR | -/+ | -0.825** (0.343) | | -0.459 (0.539) | |
| BETR | -/+ | | -0.972*** (0.323) | | -0.160 (0.408) |
| All Controls | | YES | YES | YES | YES |
| IV (Procedural) | | YES | YES | YES | YES |
| IV (Enforcement) | | YES | YES | YES | YES |
| Fixed Effects: | | | | | |
| Year | | YES | YES | YES | YES |
| Country | | NO | NO | NO | NO |
| Industry | | YES | YES | YES | YES |
| Observations | | 1,229 | 1,175 | 1,444 | 1,512 |
| Wald χ^2 | | 68.44 | 47.07 | 2,210.3 | 2,310.5 |
| R-squared | | 0.109 | 0.168 | 0.111 | 0.126 |

Table 6: Effect of Tax Avoidance on Ex Ante Equity Cost of Capital (2SLS IV approach)

Notes for Table 6:

The results are from the estimation of a 2SLS model, using as tax avoidance (*TaxAv*) measure the variable *CETR* (**Panel A**) and *BETR* (**Panel B**). In both Panels, the dependent variable is *Equity Cost of Capital*. Columns (1) and (2) comprises observations for firms engaged in lower levels of tax avoidance, while firms engaged in greater tax avoidance comprise the sample in columns (3) and (4). As Instrumental Variables (IV) we use a *Procedural* measure of tax administration, and an *Enforcement* measure. The endogenous variable in the 2SLS model is either *CETR* in columns 1 and 3, or *BETR* in columns 2 and 4.

Robust standard errors are presented in parentheses, and the symbols *, **, and *** represent significant levels of 10%, 5%, and 1%, respectively.