Corporate Tax Payments and Corporate Social Responsibility: Complements or Substitutes? Empirical Evidence from Europe

Arne Preuß1 and Björn Preuß2*

1Faculty of Business Management, Kiel University of Applied Sciences, Kiel, Germany
2Department of International Economics and Management, Copenhagen Business School, Frederiksberg, Denmark

Abstract
Recent empirical studies find mixed evidence on the relation between corporate social responsibility and corporate tax payments. We investigate for a European sample whether the two constructs act as substitutes or complements. We analyse the relation using a linear unobserved effects panel model. Our findings suggest that corporate social responsibility and corporate tax payments act as substitutes.

Keywords: Corporate social responsibility; Corporate tax payments

Introduction

Davis et al. [1] argue that stakeholders have different views on corporate tax payments (CTP) in a corporate social responsibility (CSR) context and CSR guidelines discuss CTP to a varying extent. This suggests mixed evidence on the importance of CTP in the context of CSR. Furthermore, Hanlon and Heitzman [2] call for research on the relation between CSR and corporate tax avoidance.

In fact, the relation between CTP and CSR has drawn considerable interest of researchers. However, existing research suggests different relations between CSR and CTP [8-11].

The different findings and a lack of empirical evidence for European firms motivate our research question: Are CSR and CTP complements or substitutes and why? We investigate the association between CSR and CTP. However, we do not establish causality and do not attempt to establish evidence on corporate tax avoidance.

In our research question, we ask for the reason behind the association between CSR and CTP to constitute a theoretical contribution. Therefore, we use theoretical frameworks suggesting different relations between CSR and CTP. We are able to answer our research question if we find a statistically and economically significant relation between our CSR and CTP proxy variables.

We use the methodological framework introduced by Davis et al. [1] to operationalize the firms substitutes and complements. A positive relation means that firms view CSR and CTP in the same way. If we find a positive relation between our CSR and CTP proxy variables, we argue that CSR and CTP act as complements. A positive relation is consistent with stakeholder and corporate culture theory suggesting social obligations of public firms that extend beyond creating shareholder value [8-11]. Conversely, public firms may argue that CTP detract from social welfare and paying taxes is consequently less efficient for society [12-13]. Similarly, firms may be apprehensive of negative perceptions due to lower CTP. In this case, firms with lower CTP compared to their peers increase their level of CSR to hedge against negative perceptions [14-16].

We examine the relation between CSR and CTP through a sample of 95 European public firms with 695 firm-year observations for the years 2010 through 2016 utilising a linear unobserved effects panel model. By using the fixed effect estimator, we are able to control for time-constant, unobserved home country tax system characteristics. We use very year cash effective tax rates as our proxy variable for CTP and construct our CSR measure based on the annual data set of environmental, social and governance (ESG) ratings by Thomson Reuters.

We find that CSR is negatively associated with CTP. This suggests in line with the risk management view that CTP and CSR of European public firms act as substitutes. We also examine whether the relation between CSR and CTP is moderated by current earnings performance as indicated by Watson [7]. We do not find that the relation between these two constructs is moderated by current earnings performance.

We distinguish our research from recent empirical studies. Recent empirical studies by Lanis and Richardson [3,17]; Davis et al. [1]; Huseynov and Klamm [4]; Hoi et al. [5]; Landry et al. [6] and Watson [7] differ from ours in either the sample or the CSR measures used.

The findings of our study are especially important for European public policy institutions. The results are important for European public policy institutions as our findings contribute to the understanding of activities that are considered to be socially responsible. Consequently, the results may help European public policy institutions to produce CSR reporting guidelines for public firms.

The remainder of our paper is organised as follows. Section 2

1Selection process of literature included: Five online databases which could be searched for articles were identified. These include EBSCO, ProQuest, Wiley Online, Science Direct and Emerald Insight within which English language articles were searched using the terms "corporate social responsibility" combined (connector AND) with the term "tax". The search was limited to full texts, the last 16 years (2000 until the middle of 2016), search in abstracts and refereed academic journals. References of all included articles were analysed to identify additional articles. After the exclusion of duplicates, articles were selected and evaluated using a predetermined checklist of criteria. The criteria included: adequate (i) argumentation, (ii) method and (iii) data analysis. The selection and evaluation process was undertaken initially by abstract. For those not excluded by abstract, the selection and evaluation process was conducted by reading the full text.

2We use the term home country to refer to the country in which the parent firm is incorporated.
reviews prior empirical research and theory. Section 3 describes our conceptual framework, data, research design, test results, robustness test and discussions. Section 4 concludes.

**Literature Review**

CTP play a conflicting role within the context of CSR. In fact, less agreement exists on the relation between CTP and CSR. Theory has a contrary view on the relation and the findings of empirical studies are mixed⁶. We discuss these different perspectives by summarising, comparing and contrasting previous research of the key authors.

First, existing research, stakeholder and corporate culture theory suggest a positive relation between CSR and CTP. Under stakeholder theory, firms must consider the interests of all stakeholders [9,11,18,19]. Tax authorities are included in the group of external stakeholders. Corporate culture affects corporate decisions. Kreps [10] and some corporate cultures are based on stakeholder management. Under the view of stakeholder management, public firms have social obligations that extend beyond creating shareholder value [8,9,11]. Although CTP are not entirely voluntary, managers make decisions about the extent of tax avoidance. Consequently, managers of firms with corporate cultures recognising the needs of stakeholders view common CSR and CTP in the same way. In fact, the results of two empirical studies suggest a positive relation between CSR and CTP. Lanis and Richardson [3] examine the link between CSR and corporate tax aggressiveness. Their sample consists of 408 Australian firms for the years 2008 to 2009. They find based on tobit regressions that corporations with high levels of CSR disclosure are less tax aggressive. A more recent study by Lanis and Richardson [17] investigate the relation between CSR performance and corporate tax avoidance by employing logit regressions. They examine a sample of 434 firm-year observations that have data on the Kinder, Lydenberg and Domini (KLD) annual data set from 2003 to 2009. Lanis and Richardson [17] conclude ‘that more socially responsible firms are likely to display less tax avoidance’. In summary, empirical research, stakeholder and corporate culture theory suggest that corporate culture treats CTP and common CSR in the same way resulting in a positive relation.

Second, existing research and traditional economic theory suggest no relation between CSR and CTP. Under traditional economic theory, managers allocate resources to common CSR actions only to the extent that it maximises shareholder wealth [20,21]. In some cases a high engagement in CSR seems to be economically advantageous [22-24]. However, there can be also cases where a lower CSR level is more economically beneficial [25-27]. Moreover, studies find also a mixed relation between corporate social and financial performance [28-30]. Similarly, corporate taxes might be merely perceived as operating expenses that should be minimised as much as possible [20,31]. Tax avoider can also benefit from lower cost of equity [32]. However, there can be economic restrictions of tax avoidance such as the risk of stock price crash due to tax avoidance or increased information asymmetry and agency problems between borrowers and lenders resulting in higher financing costs [33-35]. All in all, both tax avoidance and CSR are seen as mechanisms to maximise shareholder wealth that can be used independently from each other.

Third, existing research and the risk management view suggest a negative relation between CSR and CTP. Firms may argue that CTP detract from social welfare and paying taxes is consequently less efficient for society [12,13]. Consequently, firms avoid CTP. Similarly, Godfrey [36] argues that corporate reputation based on CSR is especially important when a firm is faced with a negative corporate event. Tax avoidance might result in negative sanctions. In fact, Graham et al. [37] investigate survey responses from almost 600 corporate tax managers and find that tax executives rate reputational concerns as the second main factor when corporations do not adopt a tax avoidance strategy. Furthermore, Hanlon and Semrod [38] find a small negative stock price reaction due to public revelation of tax-sheltering. And corporations based in tax havens claim to engage in CSR [39]. Firms identifying themselves as socially responsible practice tax avoidance strategies [40]. Moreover, existing research and theory of Fombrun et al. [14], Godfrey et al. [15] and Minor and Morgan [16] suggest that corporations engage in CSR to reduce the negative consequences of their publicity. Hence, firms might allocate resources to CSR to hedge against negative consequences of tax avoidance activities. In fact, one empirical study suggests a negative relation between CSR and CTP. Davis et al. [1] recent study employing an OLS and a 3SLS regression investigates the relation between CSR and CTP. Their sample includes 5,588 observations of US public firms that have data on the KLD data set from 2006 to 2011. The findings suggest that CSR is negatively related to CTP. In brief, the risk management view and empirical research suggest that CSR is used to hedge against negative sanctions due to corporate tax avoidance and CTP are not seen as a part of common CSR.

Fourth, four empirical studies suggest a mixed relation between CSR and CTP. First, Huseynov and Klamm’s [4] OLS regression analysis examines the effects of tax management fees and CSR on tax avoidance for a sample of 2,337 firm-years of S&P 500 corporations using auditor-provided tax services. They analyse data from 2000 to 2008. Their findings suggest that firms with high measures of CSR concerns tend to have lower CTP. However, Huseynov and Klamm [4] find no relation between CSR strengths and CTP. Second, Hoi et al. [5] investigate the association between CSR and corporate tax avoidance for the years 2003 to 2009. Their sample consists of 2,620 US firms. The results of OLS and logistic regressions suggest that corporations with excessive CSR are more likely to engage in tax-sheltering. However, they find no relation between CSR strengths and CTP. Third, Landry et al. [6] investigate the relation between CSR, ownership structure and tax aggressiveness employing OLS regression. The sample includes 168 Canadian firms listed on the Toronto Stock Exchange from 2004 to 2008. Landry et al. [6] conclude that tax behaviours are not necessarily aligned with CSR. Last, Watson [7] examines the effects of earnings performance on the relationship between CSR and corporate tax avoidance. The study analyses a sample of 1,929 US firms from 2003 to 2009. The OLS regression results suggest that the relation between CSR and corporate tax avoidance is moderated by earnings performance and is moreover mixed.

Table 1 summarises the key characteristics of the recent empirical studies on the relation between CSR and CTP.

**Econometric Analysis**

**Conceptual framework**

Corporate social responsibility: environmental, social and governance aspects?: CSR goes by many names, has different theoretical foundations and is closely related to similar terms such as social performance [7,9,41,42]. CSR implies that economic, legal, discretionary and ethical aspects are incorporated into corporate
decision making [43-45]. The different interests of non-shareholder stakeholders should be considered [44]. As environmental attention is an aspect of CSR, a comprehensive term is used to investigate CSR by including ecological aspects into the conceptual term of CSR [46]. We exclude corporate governance as the relation between CTP and corporate governance is likely to be different and is investigated previously [1,47,48].

**Corporate tax avoidance: not corporate tax payments:** Because of different absolute values, currencies of European firms and potential mismatches due to annual data, we do not use current CTP itself as our conceptual term. Instead of CTP, we use corporate tax avoidance. Consistent with Dyreng et al. [49] and Hanlon and Heitzman [2], we define tax avoidance broadly as the reduction of tax liabilities, covering legal tax planning activities but also activities that are best described with the terms tax sheltering and tax evasion. There are two different estimates of tax liabilities: (i) income tax expense and (ii) cash taxes paid [2]. Cash taxes paid address our research question. If we measure corporate tax avoidance by a measure utilising cash taxes paid, tax avoidance decreases CTP. Furthermore, there are well-developed measures of corporate tax avoidance available that utilise cash taxes paid, tax rates and tax enforcement) have an impact on corporate tax avoidance. We define tax avoidance broadly as the reduction of tax liabilities, covering legal tax planning activities but also activities that are best described with the terms tax sheltering and tax evasion. There are two different estimates of tax liabilities: (i) income tax expense and (ii) cash taxes paid [2]. Cash taxes paid address our research question. If we measure corporate tax avoidance by a measure utilising cash taxes paid, tax avoidance decreases CTP. Furthermore, there are well-developed measures of corporate tax avoidance available that utilise cash taxes paid [2]. All in all, the conceptual term corporate tax avoidance seems to be useful to answer our research question. But we do not attempt to establish evidence on corporate tax avoidance.

We note determinants of tax avoidance as we need to include control variables for a reasonable ceteris paribus analysis. Hanlon and Heitzman [2] summarise the theoretical determinants of tax avoidance, i.e., penalties, tax rates, probability of detection and tax evasion. There are two different estimates of tax liabilities: (i) income tax expense and (ii) cash taxes paid [2]. Cash taxes paid address our research question. If we measure corporate tax avoidance by a measure utilising cash taxes paid, tax avoidance decreases CTP. Furthermore, there are well-developed measures of corporate tax avoidance available that utilise cash taxes paid [2]. All in all, the conceptual term corporate tax avoidance seems to be useful to answer our research question. But we do not attempt to establish evidence on corporate tax avoidance.

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**Table 1:** Key Characteristics of Recent Empirical Studies.

| Study | Sample | Econometric analysis | Tax proxy variable | CSR proxy variable | Key findings |
|-------|--------|----------------------|--------------------|--------------------|--------------|
| Lanis and Richards [3] | 408 Australian firms; 2008/2009 | Tobit regression | Short-term effective tax rates | Self-developed disclosure index | Suggesting positive relation |
| Lanis and Richardson [17] | 434 firm-years from KLD database; 2003-2009 | Logit regression | Tax disputes and book tax differences | Index based on KLD data | Suggesting positive relation |
| Davis et al. [1] | 5,586 firm-years of U.S. firms; 2006-2011 | OLS regression and three-stage least squares model | Long-term cash effective tax rate | Index based on KLD data | Suggesting positive relation |
| Huseynov and Klaemm [4] | 2,337 firm-years of S&P500 firms; 2000-2008 | OLS regression | Effective tax rates | Indices based on KLD data | Suggesting positive relation |
| Hoi et al. [5] | 11,006 firm-years of U.S. firms; 2003-2009 | OLS and logistics regression | Book-tax differences; short-term cash effective tax rate and sheltering probabilities | Indices based on KLD data | Suggesting positive relation |
| Landry et al. [6] | 551 firm-year observations of Canadian firms; 2004-2008 | OLS regression | Short-term effective tax rate | Rating and indices based on Canadian Social Investment Database | Suggesting positive relation |
| Watson [7] | 7,297 firm-years of U.S. firms; 2003-2009 | OLS regression | Short-term cash effective tax rate | Indices based on KLD data | Suggesting positive relation |

*Selection process of literature included: Five online databases which could be searched for articles were edidenti. These include EBSCO, ProQuest, Wiley Online, Science Direct and Emerald Insight within which English language articles were searched using the terms "corporate social responsibility" combined (connector AND) with the term "tax." The search was limited to full texts, the last 16 years (2000 until the middle of 2016), search in abstracts and refereed academic journals. References of all included articles were analysed to identify additional articles. After the exclusion of duplicates, articles were selected and evaluated using a predetermined checklist of criteria. The criteria included: adequate (i) argumentation, (ii) method and (iii) data analysis. The selection and evaluation process was conducted by reading the full text.

**Data**

Our sample initially consists of all firms listed in the MSCI Europe Index in July 2017. For these firms we collected annual financial data and ESG scores for the years 2006 through 2016. Because our CTP measure requires five years of data, our final sample includes just the years 2010 through 2016 (T–7). Due to data availability the number of cross-sectional units declined from 292 to 95 (n=95). Our final data set consists of repeated observations on these 95 firms for the years 2010 through 2016.

We analyse a balanced panel with 665 observations (N=665). Compared to recent research, Landry et al. [6], Lanis and Richardson [3] and Lanis and Richardson [17] analyse smaller samples. However, Davis et al. [1]; Huseynov and Klaemm [4]; Watson [7] and Hoi et al. [5] investigate larger samples (Table 1).

The main advantage of panel data is that panel econometric techniques allow to control for unobserved, time-constant characteristics (e.g., home country tax system and family ownership) of our cross-sectional units [53]. Atwood et al. [54] find that home country tax system characteristics (book-tax conformity, worldwide approach and tax enforcement) have an impact on corporate tax avoidance. We can control for unobserved, time-constant home country tax system characteristics utilising panel econometric techniques.

Annual financial accounting data for our dependent variable (ETR) and our control variables (SIZE, LEV, INTANG, PTROA, SALES, PPE, management view.

[1] operationnalize the firms substitutes and complements. We view CSR and CTP as complements in line with corporate culture and stakeholder theory, if we find a positive relation between these constructs. Conversely, CSR and CTP act as substitutes, if we find a negative relation. A negative relation is consistent with the risk management view.
For INC, SG&A, R&D, CASH) were obtained from Compustat. Data on CSR and corporate governance ratings for CSR, CSR<sup>1-33</sup>, CSR<sup>33-64</sup> and GOV come from Thomson Reuters. Therefore, we used both data by Thomson Reuters and Compustat to calculate our moderating variable LoP T ROA CSR. Table 2 presents descriptive statistics. The variables are defined in Appendix A. Hereby we follow [1,5,7].

Because of major changes in absolute values, different currencies in the financial data of our sample firms and potential mismatches due to annual data, we do not use CTP itself as our CTP measure. Instead of CTP, we use a corporate tax avoidance measure. But we do not attempt to establish evidence on corporate tax avoidance. We merely analyse the act of paying taxes.

We defined corporate tax avoidance as the reduction of tax liabilities, covering legal and illegal activities. There are two different estimates of tax liabilities: (i) income tax expense and (ii) cash taxes paid [2]. Our study analyses CTP and not tax expenses. Hence, cash taxes paid are more appropriate than income tax expenses. Cash taxes paid are disclosed in the statement of cash flows<sup>6</sup>. Therefore, it is likely that cash effective tax rates can be calculated for all sample firms.

However, cash flows can arise in different time periods in relation to the underlying transaction. Long-run cash effective tax rates try to avoid this potential mismatch [2]. A potential mismatch should be avoided by pooling cash flows of different time periods. Therefore, we use long-run cash effective tax rates proposed by Dyreng et al. [49] as a proxy variable for CTP. Long-run cash effective tax rates are calculated as follows: five-year sum of cash taxes paid divided by five-year sum of pre-tax income less special items. In contrast to Dyreng et al. [49], the five-year cash effective tax rate was chosen instead of the ten-year cash effective tax rate. This is consistent with Davis et al. [1] focussing on the same research question. In fact, cash effective tax rates are a frequently used [1,5,7]. We interpret a high ET R as high CTP and a low ET R as low CTP.

It can be criticised that cash effective tax rates can have negative values and values greater than one. In the case of a negative sum of pre-tax income and/or cash taxes paid, long-run cash effective tax rates are very difficult to interpret. Dyreng et al. [49] definition of cash effective tax rates does not take these aspects into account.

In this context, Dyreng et al. [49] eliminate firm-years with a negative or zero denominator and winsorize cash effective tax rates at zero and one. Consequently, Dyreng et al. [49] eliminate 18 percent of one-year observations. But this can result in the problem of data truncation bias which can lead to spurious results [55].

For comparability with Davis et al. [1], observations with five-year cash effective tax rates greater than 1 or less than 0 are eliminated. Consequently, we just analyse firms with five-year cash effective tax rates between 0 and 1<sup>7</sup>.

Consistent with our broad view on CSR, we use a multi-category CSR proxy variable. 4 out of all 7 previous studies use several CSR indices (Table 1). Hereby, it is common to separate CSR strengths and concerns. Strengths and concerns are analysed separately. However, irresponsible CSR activities can be unintended (e.g., explosion of oil platform). Firms are likely to compensate unintended irresponsible CSR activities with responsible CSR activities. Therefore, CSR concerns as a single CSR activities measure may be rather inappropriate. We argue that a single multi-category CSR measures is more appropriate. CSR ratings by KLD are frequently used within the class of multi-category CSR measures [24,28,29,56-58]. Similarly, CSR ratings by

| Variable<sup>a</sup> | Min. | 1<sup>st</sup> Qu. | Median | Mean | 3<sup>rd</sup> Qu. | Max. |
|----------------------|------|-----------------|--------|------|----------------|------|
| ETR                  | 0    | 0.2             | 0.25   | 0.26 | 0.31           | 0.91 |
| CSR                  | 0    | 0               | 0      | 0.49 | 1              | 1    |
| SIZE                 | 4.72 | 8.17            | 9.32   | 9.35 | 10.38          | 12.78|
| LEV                  | 0    | 0.12            | 0.18   | 0.2  | 0.27           | 0.63 |
| INTANG               | 0    | 0.1             | 0.19   | 0.22 | 0.33           | 0.78 |
| PROTOA               | -0.02| 0.03            | 0.06   | 0.07 | 0.09           | 0.28 |
| SALES                | -0.18| 0.01            | 0.04   | 0.05 | 0.07           | 0.47 |
| For INC              | -0.44| -0.01           | 0      | 0.03 | 0              | 3.3  |
| SG&A                 | 0    | 0.07            | 0.15   | 0.16 | 0.21           | 0.79 |
| R&D                  | 0    | 0.01            | 0.02   | 0.03 | 0.04           | 0.46 |
| PPE                  | 0.02 | 0.12            | 0.21   | 0.24 | 0.32           | 0.76 |
| CASH                 | 0.01 | 0.06            | 0.1    | 0.12 | 0.14           | 0.85 |
| GOV                  | 0    | 0               | 0.49   | 1    | 1              |      |
| CSR<sup>1-33</sup>   | 0    | 0               | 0.34   | 1    | 1              |      |
| CSR<sup>33-64</sup>  | 0    | 0               | 0.38   | 1    | 1              |      |
| LoPTROA              | 0    | 0               | 1      | 0.64 | 1              | 1    |
| LoPTROA CSR          | 0    | 0               | 0.35   | 1    | 1              |      |

<sup>a</sup>Variable definitions:
ETR: Cash taxes paid divided by pretax income less special items; CSR: Socially responsible firms are ranked 47th or lower in relation to environmental and social ratings by Thomson Reuters (CSR: 1) otherwise CSR: 0; SIZE: natural logarithm of total assets; LEV: total debt scaled by lagged total assets; INTANG: intangible assets divided by lagged total assets; PROTOA: pretax income divided by lagged total assets; SALES: changes in sales scaled by lagged sales; For INC: absolute value of foreign exchange income divided by the absolute value of pretax total income; SG&A: selling; general and administrative expense divided by lagged total assets; R&D: research and development expense divided by lagged total assets; PPE: net property; plant and equipment divided by lagged total assets; CASH: cash and short-term investments divided by lagged total assets; GOV: firms with a high level of corporate governance are ranked 47<sup>th</sup> or lower in relation to governance ratings by Thomson Reuters (GOV: 1) otherwise GOV: 0; CSR<sup>1-33</sup>: firms with a high level of CSR are ranked 33<sup>rd</sup> or lower in relation to environmental and social ratings by Thomson Reuters (CSR: 1) otherwise CSR: 0; CSR<sup>33-64</sup>: firms with a medium level of CSR are ranked between 33<sup>rd</sup> and 64<sup>th</sup> in relation to environmental and social ratings by Thomson Reuters (CSR: 1) otherwise CSR: 0; and LoPTROA: firms with low earnings performance have a PROTOA<0.07 (LoPTROA: 1) otherwise LoPTROA: 0.

<sup>b</sup>Variable definitions:
ETR: Cash taxes paid divided by pretax income less special items; CSR: Socially responsible firms are ranked 47th or lower in relation to environmental and social ratings by Thomson Reuters (CSR: 1) otherwise CSR: 0; SIZE: natural logarithm of total assets; LEV: total debt scaled by lagged total assets; INTANG: intangible assets divided by lagged total assets; PROTOA: pretax income divided by lagged total assets; SALES: changes in sales scaled by lagged sales; For INC: absolute value of foreign exchange income divided by the absolute value of pretax total income; GOV: selling; general and administrative expense divided by lagged total assets; R&D: research and development expense divided by lagged total assets; PPE: net property; plant and equipment divided by lagged total assets; CASH: cash and short-term investments divided by lagged total assets; GOV: firms with a high level of corporate governance are ranked 47<sup>th</sup> or lower in relation to governance ratings by Thomson Reuters (GOV: 1) otherwise GOV: 0; CSR<sup>1-33</sup>: firms with a high level of CSR are ranked 33<sup>rd</sup> or lower in relation to environmental and social ratings by Thomson Reuters (CSR: 1) otherwise CSR: 0; CSR<sup>33-64</sup>: firms with a medium level of CSR are ranked between 33<sup>rd</sup> and 64<sup>th</sup> in relation to environmental and social ratings by Thomson Reuters (CSR: 1) otherwise CSR: 0; and LoPTROA: firms with low earnings performance have a PROTOA<0.07 (LoPTROA: 1) otherwise LoPTROA: 0.

<sup>c</sup>We do not use data from corporate income tax returns to calculate our CTP measure.

<sup>d</sup>41 firm-years of our initial sample have ET R>1 and 138 firm-years have ET R<0.
KLD are used in recent research on the relation between CSR and taxes and are a generally accepted CSR measure [59,60]. We argue that CSR cannot be measured as it is a matter of people’s life. Ratings depend on subjective aspects and are characterised by the risk of arbitrariness. However, 5 out of all 7 studies on the link between CSR and taxes use KLD data. We argue that research on the relation between CSR and taxes should not refer to a single rating agency. In conclusion, it seems reasonable for us to use an alternative, multi-category CSR rating source such as Thomson Reuters. A basic description of Thomson Reuters ESG database is provided in Lys et al. [61].

As it is difficult to interpret a one-unit increase in CSR rating and our CSR rating takes on many values, we break it into two categories by using a binary variable. We view a firm-year as socially responsible, if the firm-year is ranked 47th or lower in relation to environmental and social ratings by Thomson Reuters (CSR=1). Otherwise we view a firm year as socially irresponsible (CSR=0). We use this interval boundary as it separates the top 50 percent from the lowest 50 percent of our 95 sample firms in each time period.

Finally, it must be considered that jurisdictional differences in relation to CSR and CTP are likely. Therefore, we control for unobserved, time-constant effects (e.g., home country tax system).

Research design

Theory (i.e., traditional economic theory, risk management view, stake-holder and corporate culture theory) predicts different relations between CSR and CTP. We test the different theoretical relations between CSR and CTP by estimating the following unobserved effects panel data model for firm $i = 1; 2; \ldots; n$ in time period $t = 1; 2; \ldots; T$:

$$
ETR = \beta_0 + \beta_1 \text{CSR} + \beta_2 \text{SIZE} + \beta_3 \text{LEV} + \beta_4 \text{INTANG} + \beta_5 \text{PTROA} + \beta_6 \text{SALES} + \beta_7 \text{F}
$$

or

$$
\text{INC}_c + \beta_8 \text{SGA} + \beta_9 \text{R&D} + \beta_{10} \text{PPE} + \beta_{11} \text{CASH} + \beta_{12} \text{GOV} + \epsilon
$$

(1)

We follow Davis et al. [1] in developing our model as we try to answer the same research question. In relation to Equation (1), we use, however, a more general model with less observed variables. Therefore, it can be applied to non-public firms by future research. We do not use observed variables for tax benefit of stock options, market-to-book ratio, tax loss carry forward, excess cash and financial constraints. We add SALES as a growth measure. As we use five-year cash effective tax rates, we use mean values of all financial control variables measured over the same five-year period. We use five-year means for financial variables to avoid mismatches and high volatility due to accounting policy. In contrast to Davis et al. [1], we do not use five-year means for CSR and GOV as we want to investigate annual data and do not expect similar policy impacts compared to our financial variables.

In contrast to all previous studies, our panel data set allows us to control for all unobserved, time-constant firm characteristics [53]. This allows us to analyse firms of different countries and tax systems. However, we cannot control for unobserved, time-varying home country tax system or CSR regulation characteristics.

We argue that $\beta$ is the difference in ETR between socially responsible and irresponsible firm years. Therefore, the variable CSR and the coefficient 1 address our research question.

We estimate our model by the fixed effects estimator. We treat our dependent variable ETR as standard continuous. Gow et al. [62] emphasise the importance to correct for cross-sectional and time-series dependence in accounting research. Therefore, all $t$-statistics are calculated using two-way (firm, year) cluster-robust standard errors as introduced by Cameron et al. [63] and Thompson [64]. We use the package plm for our econometric analysis [65-66].

Results

Theory about the relation between CSR activities and CTP (i.e., traditional economic theory, risk management view, stakeholder and corporate culture theory) was tested to determine whether CSR and CTP act as substitutes or complements by using a linear unobserved panel data model. Our model was estimated by the fixed effects estimator. We test theory to explain why CSR and CTP act as substitutes or complements.

Column (1) of Table 3 presents the association between CSR and ETR without control variables. In Column (2) of Table 3, we present the results for our Equation (1). We found a small, negative association that is statistically and economically significant. This suggest that firm-years with high CSR ratings have significantly lower CTP than other firm-years. A one-unit increase in CSR is associated with a 2 percent points decrease in ETR, indicating that CSR activities and CTP act as substitutes. The difference between socially responsible and irresponsible firm-years is rather small as 25 percent of our observations have cash effective tax rates below 0.20 and 50 percent below 0.25. Nevertheless, the association of the relation between CSR and CTP is in our view economically significant as 2 percent points can have a great impact in the case of high taxable income. Furthermore, we must consider that we analysed cash effective tax rates between 0 and 1, but not regular corporate tax rates. Finally, we emphasise that we do not establish causality in the relation between CSR and CTP. We seek only to provide evidence on association.

Sensitivity analysis

We broke the CSR rating into three categories to analyse the relation in more detail: top 32, 33rd to 64th and 65th to 95th. In Column (3) of Table 3, we present our findings. For CSR$^{top32}$, our results are consistent with our previous findings. However, the coefficient is with 0.01 smaller compared to Equation (1). Nevertheless, it indicates that firms with a high level of CSR pay less corporate taxes than firms with a medium level of CSR. But it must be mentioned that the change in ETR is small.

Finally, it was tested whether the relation between CSR activities and CTP is moderated by low earnings performance. We use for this variation of our regression model the fixed effects estimator as an approximation. They provide evidence that a lack of CSR is positively associated with tax avoidance when earnings performance is low. When including the moderating variable LoP T ROA CSR into the model, we found no statistically significant relation. This indicates that the relation between CSR and CTP is not moderated by low earnings performance (see Column (4) of Table 3). Our other results are consistent with our previous findings.

Discussion

Our findings suggest that CSR and CTP of European public firms act as substitutes. Therefore, we hypothesise in line with Davis et al. that CTP cannot be viewed as part of CSR. The reason for this is that we identified a negative association between CSR and CTP. We
We investigated the relation between CTP and CSR. Because theoretical and empirical research suggest different relations, we analysed whether the two constructs are complements or substitutes using a panel data set of 95 European public firms with 695 firm-year observations for the years 2010 through 2016. We found that corporate social responsibility is negatively associated with corporate income tax return data to construct our CTP measure and we did not analyse corporate tax avoidance as such, merely the act of paying corporate taxes. Therefore, we cannot infer that avoidance activities were undertaken by our sample firms. Especially, our CTP proxy variable does not capture conforming tax avoidance. In the case of a negative sum of pretax income and/or cash taxes paid, our CTP measure is furthermore very difficult to interpret. Fourth, our sample firms were listed in the MSCI Europe Index in July 2017, but we analysed the time period 2010 through 2016. Therefore, our findings are limited by the subsequent survival bias. Fifth, we analyse different countries. The tax system and ESG regulation characteristics are subsequently different. However, we can only control for time-constant regulation characteristics. But tax systems vary also within countries (e.g., US state tax or German trade tax).

**Conclusion**

We investigated the relation between CTP and CSR. Because theoretical and empirical research suggest different relations, we analysed whether the two constructs are complements or substitutes using a panel data set of 95 European public firms with 695 firm-year observations for the years 2010 through 2016. We found that corporate social responsibility is negatively associated with corporate tax payments. This suggests in line with the risk management view that corporate tax payments and corporate social responsibility of European public firms act as substitutes. We hypothesise that corporate tax payments cannot be viewed as part of corporate social responsibility. However, we did not find that socially responsible firms avoid corporate taxes as we merely analysed the act of paying taxes.

| Variables | (1) | (2) | (3) | (4) |
|-----------|-----|-----|-----|-----|
| CSR       | -0.03 | (-2.51)* | -0.02 | (-3.67)** |
| SIZE      | -0.05 | (-1.11) | -0.05 | (-1.14) |
| LEV       | -0.1  | (-0.75) | -0.09 | (-0.65) |
| INTANG    | 0.09  | (0.95)  | 0.1   | (-1.07) |
| PTROA     | -1.14 | (-4.88)** | -1.16 | (-4.95)** |
| SALES     | 0.11  | (0.98)  | 0.09  | (-0.81) |
| For Inc   | -0.01 | (-0.36) | 0     | (-0.18) |
| SG&A      | -0.29 | (-3.24)** | -0.31 | (-2.57)** |
| R&D       | -0.99 | (-1.39) | -0.95 | (-1.30) |
| PPE       | -0.04 | (-0.36) | -0.04 | (-0.35) |
| CASH      | -0.1  | (-0.68) | -0.11 | (-0.77) |
| GOV       | 0.01  | (3.59)** | -0.01 | (2.97)** |
| CSR (33-64) | -0.01 | (-2.97)** |
| CSR (65-100) | 0     | (-0.74) |
| LoPTROA   | 0     | (-0.44) |
| LoPTROA CSR | 0     | (-0.34) |
| Time dummies | Yes   | Yes   | Yes   | Yes   |
| R²        | 0.06  | 0.22  | 0.21  | 0.22  |
| Observations | 665   | 665   | 665   | 665   |

*Variable definitions:
ETR: cash taxes paid divided by pretax income less special items; CSR: socially responsible firms are ranked 47th or lower in relation to environmental and social ratings by Thomson Reuters (CSR: 0) otherwise CSR: 1; SIZE: natural logarithm of total assets; LEV: total debt scaled by lagged total assets; INT ANG: intangible assets divided by lagged total assets; P T ROA: pretax income divided by lagged total assets; SALES: changes in sales scaled by lagged sales; F orINC: absolute value of foreign exchange income divided by the absolute value of pretax total income; SG&A: selling, general and administrative expense divided by lagged total assets; R&D: research and development expense divided by lagged total assets; P P E: net property, plant and equipment divided by lagged total assets; CASH: cash and short-term investments divided by lagged total assets; GOV: firms with a high level of corporate governance are ranked 47th or lower or in relation to governance ratings by Thomson Reuters (GOV: 0) otherwise GOV: 1; CSR (33-64): firms with a medium level of CSR are ranked between 33rd and 64th in relation to environmental and social ratings by Thomson Reuters (CSR (33-64): 1) otherwise CSR (33-64): 0; CSR (65-100): firms with a high level of CSR are ranked between 65th and 100th in relation to environmental and social ratings by Thomson Reuters (CSR (65-100): 1) otherwise CSR (65-100): 0; CSR top32: firms with a high level of CSR are ranked 32nd or lower in relation to environmental and social ratings by Thomson Reuters (CSR top32: 1) otherwise CSR top32: 0; CSR r33-64: firms with a medium level of CSR are ranked between 33rd and 64th in relation to environmental and social ratings by Thomson Reuters (CSR r33-64: 1) otherwise CSR r33-64: 0 and LoP T ROA: firms with low earnings performance have a PTROA<0.07 (LoPTROA: 1) otherwise LoPTROA: 0.

** Table 3: Regression Results.**

shown that this negative association between CSR and ETR is both statistically and economically significant. Our findings support the risk-management perspective on the relation between CTP and CSR. European public firms seem to use CSR as a tool to hedge against public sanctions due to lower CTP compared to their peers. However, we do not establish causality. We only provide evidence on association.

Our result is similar to Davis et al. [1]. In contrast to our result, the findings of most previous studies suggest that there is a mixed relation between CSR and CTP [2-3,5,7]. Besides the fact that most studies, with the exception of Davis et al. [1], do not address the same research question, we can mention one major reason for our different result. We did not analyse CSR strength and weaknesses in relation to CSR separately. 4 out of all 7 previous studies use several CSR activities measure seem to be rather inappropriate.

We must mention five important limitations of our research. First, we face the issue of selection bias by eliminating firm-years with cash effective tax rates greater than 1 and less than 0. We were not able to implement a reasonable selection model as there is a lack of defensible exclusion restrictions. It must be pointed out that our results are limited to firm-years with complete independent variables and cash effective tax rates between 0 and 1. Second, it is possible that CSR and CTP are endogenous [1]. However, we did not find reasonable instrumental variables for a 2SLS framework. Third, we did not use
51. Slemrod J (2004) The economics of corporate tax selfishness. National Tax Journal 57: 877-899.
52. Desai MA, Dyck A, Zingales L (2007) Theft and taxes. Journal of Financial Economics 84: 591-623.
53. Wooldridge JM (2010) Econometric Analysis of Cross Section and Panel Data, 2nd Edition. Cambridge/London: MIT Press.
54. Atwood TJ, Drake MS, Myers JN, Myers LA (2012) Home country tax system characteristics and corporate tax avoidance: International evidence. The Accounting Review 87: 1831-1860.
55. Teoh SH, Zhang Y (2011) Data truncation bias, loss firms, and accounting anomalies. The Accounting Review 86: 1445-1475.
56. Graves SB, Waddock SA (1994) Institutional owners and corporate social performance. The Academy of Management Journal 37: 1034-1046.
57. Turban DB, Greening DW (1997) Corporate social performance and organizational attractiveness to prospective employees. The Academy of Management Journal 40: 658-672.
58. Johnson RA, Greening DW (1999) The effects of corporate governance and institutional ownership types on corporate social performance. The Academy of Management Journal 42: 564-576.
59. Chatterji AK, Levine DI, Toel MW (2009) How well do social ratings actually measure corporate social responsibility? Journal of Economics & Management Strategy 18: 125-169.
60. Mattingly JE, Berman SL (2006) Measurement of corporate social action: Discovering taxonomy in the kinder lydenburg domini ratings data. Business and Society 45: 1-27.
61. Lys T, Naughton JP, Wang C (2015) Signalling through corporate accountability reporting. Journal of Accounting and Economics 60: 56-72.
62. Gow ID, Ormazabal G, Taylor DJ (2010) Correcting for cross-sectional and time-series dependence in accounting research. The Accounting Review 85: 483-512.
63. Cameron AC, Gelbach JB, Miller DL (2011) Robust inference with multiway clustering. Journal of Business & Economic Statistics 29: 238-249.
64. Thompson SB (2011) Simple formulas for standard errors that cluster by both firm and time. Journal of Financial Economics 99: 1-10.
65. Croissant Y, Milo G (2008) Panel data econometrics in r: The plm package. Journal of Statistical Software 27: 1-43.
66. Milo G (2014) Robust standard error estimators for panel models: a unifying approach. MPRA Paper No. 54954.