

Article

Private Firm Support for Circular Economy Regulation in the EU Policy Context

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Abstract: As an empirical investigation of firm support for circular economy regulation in the European Union (EU) context, this paper is the first to connect the research field on corporate political activity with the growing research field on the circular economy. The paper presents these two research streams, draws on theories such as the resource-based view, and employs a hierarchical regression framework to formulate and test six hypotheses on what drives firms to support circular economy regulation. We find that smaller firms show more support for circular economy regulation than larger firms do and identify two moderating effects: the stock listing seems to moderate the relationship between firm size and a firm's support for circular economy regulation; and a firm's supply chain position has a counterintuitive negative moderating effect on the relationship between slack resources and a firm's support for circular economy regulation. We discuss null findings and suggest avenues for future research at this under-researched intersection of policies and firms in the circular economy context.

Keywords: circular economy; corporate political activity; regulation; policy; EU



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1. Introduction

Policies that encourage the economy's decarbonization, such as the European Green Deal [1] and the Circular Economy Action plan [2], target climate change, one of our time's most significant challenges [3]. The circular economy (CE), which the Ellen MacArthur Foundation (2015) [4] defines as "an industrial system that is restorative or regenerative by intention and design", is often seen as a promising solution. In pursuit of such a system, firms are expected to contribute to the CE transition [5], which should ideally be supported by an intelligent design of CE regulations and policy incentives for effective implementation [6]. Therefore, companies frequently support green regulation efforts and engage with policy-makers to shape such regulations, despite the cost firms may incur when such regulations are implemented. Research shows that doing so might pay off for firms, whether in the form of competitive first-mover advantage [7] or increased reputation effects [8].

However, little empirical research addresses corporate political activity (CPA) in the CE context, so an extensive research gap remains regarding whether and how firms engage with and influence socio-political stakeholders to manage regulatory uncertainties—more specifically, CE regulation. The CE concept has received growing interest from policy-makers, practitioners, and academia [9–12] but has not yet been subject to investigations on the level of interactions between firms and policy-makers. Earlier CE studies often take an industrial ecology viewpoint [13] or a pure policy perspective [14]. With more recent publications, the field has entered the organizational literature in discussing circular business models [9,15,16] and circular ecosystems of firm consortia [17,18]. However, little to no research takes a multi-level perspective in investigating the interaction effects and relationships between the firm level and policy level. While the broader literature explores the interrelationships between lobbying and corporate social responsibility (CSR) [19,20],

none of these studies investigates the CE context. For example, we do not yet know what drives firms to manage relationships with socio-political stakeholders or how these firms influence CE policy-making. To the best of our knowledge, to date, no other study investigates what determines firm-level political support for CE regulation. Therefore, we deploy the European Union (EU) Commission context of public consultations on the CE action plan in 2015 to investigate empirically our research question: What determines a firm's support for CE regulation?

We create a novel indicator of firms' support for CE regulation that stems from the EU Commission's data set on public consultations regarding CE. To our knowledge, this data set has not been deployed in this context so far. We connect these data with additional company information to derive insights into what drives firms' support of CE regulation and test our hypotheses empirically in a hierarchical regression framework that pays special attention to robustness. As our investigation may be understood as only an early start to opening the field of CPA research in the CE context, we discuss the limitations of this paper in some detail and suggest a research agenda for the field.

2. Literature and Theoretical Background

This study investigates an area at the intersection of CPA and the CE and takes a predominantly resource-based view to develop hypotheses. Here, we describe the theoretical background and literature that are relevant to these three aspects.

2.1. Circular Economy

Pearce and Turner (1990) [21] first introduced the CE concept as part of the sustainability literature. The concept found its roots in earlier concepts, for example, Boulding's (1966) [22] closed-loop systems and Stahel and Reday's (1981) [23] industrial economy loops. While similar in some ways to concepts such as industrial ecology [24–26] and cradle-2-cradle [12,27,28], in the firm context, the CE concept refers to maintaining the value of firms' resources over time, thereby reaching environmental sustainability without compromising inclusive growth. Circular business models are a vital tool in the pursuit of growth on the firm level of the CE [29–38]. Publications on the CE in general have also grown significantly [39]. These papers discuss CE's concept definition in detail [40–42], social implications of the CE [42], enablers of and barriers to the implementation of circularity [6], the benefits of CE to various sectors [43], indices and measurement of circular performance [13,44–46], cross-collaboration in circular ecosystems [17,18], systemic approaches to regional implementation [47,48] (e.g., from a waste management perspective [49–51]), and the CE's progress through policy-making (e.g., for European context, see [52]). However, we found no study that analyzes how CPA takes place in the context of CE regulation.

2.2. Corporate Political Activities

CPA is rooted in the idea of firms' so-called non-market strategy as a complement to their market strategy [53], i.e., “managing the institutional or societal context of economic competition” to enhance performance [54,55]. CPA more specifically is defined as “corporate attempts to shape government policy” [56] (see also [57,58]) and led to Barley's theory of an institutional field of political influence [59]. As Barley (2010) notes, firms' interest in shaping policy is a global and flourishing phenomenon and is performed either directly by corporations or indirectly through intermediaries [60]. CPA together with corporate social responsibility (CSR) (e.g., [61]), defined as “context-specific organizational actions and policies that take into account stakeholders' expectations and the triple bottom line of economic, social, and environmental performance” [62], are responses to the growing expectations that firms engage with and in environmentally friendly activities [63,64]. Scholars find that these activities positively correlate with performance outcomes [65–67].

Recent game-theoretical articles shed light on the underlying mechanism and contextual dynamism that motivate firms' engagement in or support for social or green regulation [7,68,69]. These studies show that lobbying for green regulation can improve a firm's

competitive advantage and have positive impacts on performance indicators (e.g., [70]). Other research finds that a position in the supply chain that is closer to consumers leads to more sustainable practices (e.g., [71]) because of the increased visibility to end consumers. Besides, research has identified organizational variables such as firm size, age, and slack resources to influence firms' attitude toward sustainability [72]. To date, there is no research that addresses the intersection of CPA and CE in particular.

2.3. Resource-Based View

The resource-based view (RBV) of the firm investigates firms from the "resource side rather than from the product side" [73]. It analyzes how firms deploy resources which may develop into capabilities or even core competencies, which in return can explain differences in firm performance [74]. A set of valuable, rare, inimitable, and non-substitutable (VRIN) resources creates a competitive advantage [75], so the classic RBV of the firm interprets strategy as a translation of companies' core competencies and the effective and efficient deployment of resources such as internal firm capabilities and assets [74,76].

The extension of this theory is the natural RBV (NRBV) of the firm, which theorizes that competitive advantage is based on the firm's relationship to the natural environment [77]. The NRBV suggests a positive influence of three sustainability-related interconnected strategies on firm performance [77,78]: pollution prevention, product stewardship, and sustainable development.

According to the broader RBV perspective, firms' engagement in a CE could create a long-term advantage [79,80].

Within the RBV literature, the field of dynamic capabilities research [81–83] has gained importance. Dynamic capabilities are the "ability to integrate, build, and reconfigure internal and external competencies to address rapidly changing environments" [84], a logic that has also influenced the NRBV [78]. The dynamic capabilities approach is thus also quite helpful to explain the adoption and outcome of CE practices in firms [85].

3. Development of Hypotheses

Given the CE's growing importance to reach the sustainable development goals [13,86], we investigate what drives firm support for CE regulation in the EU context and at the intersection of the literature fields of CE and CPA. This study is a starting point in the examination of what drives firms to support CE regulation (i.e., CE-specific CPA) and the moderating factors of these relationships. To investigate these drivers and moderators, we deploy the theoretical logic of the resource-based view and propose a model for a regression framework, shown in Figure 1.

We formulate six hypotheses that refer to firms' organizational characteristics. Our models take a standard view of companies as profit-maximizers (e.g., [87]) that are more willing to engage in CE when they expect benefits for doing so. These benefits could come in the form of, for example, increased market share, increased independence from suppliers, and improved reputation with end customers. This cost-benefit calculation should reflect the firms' political statements in CE-related consultations. The hypotheses development follows, and the measures and constructs are described in the subsequent research methods section.

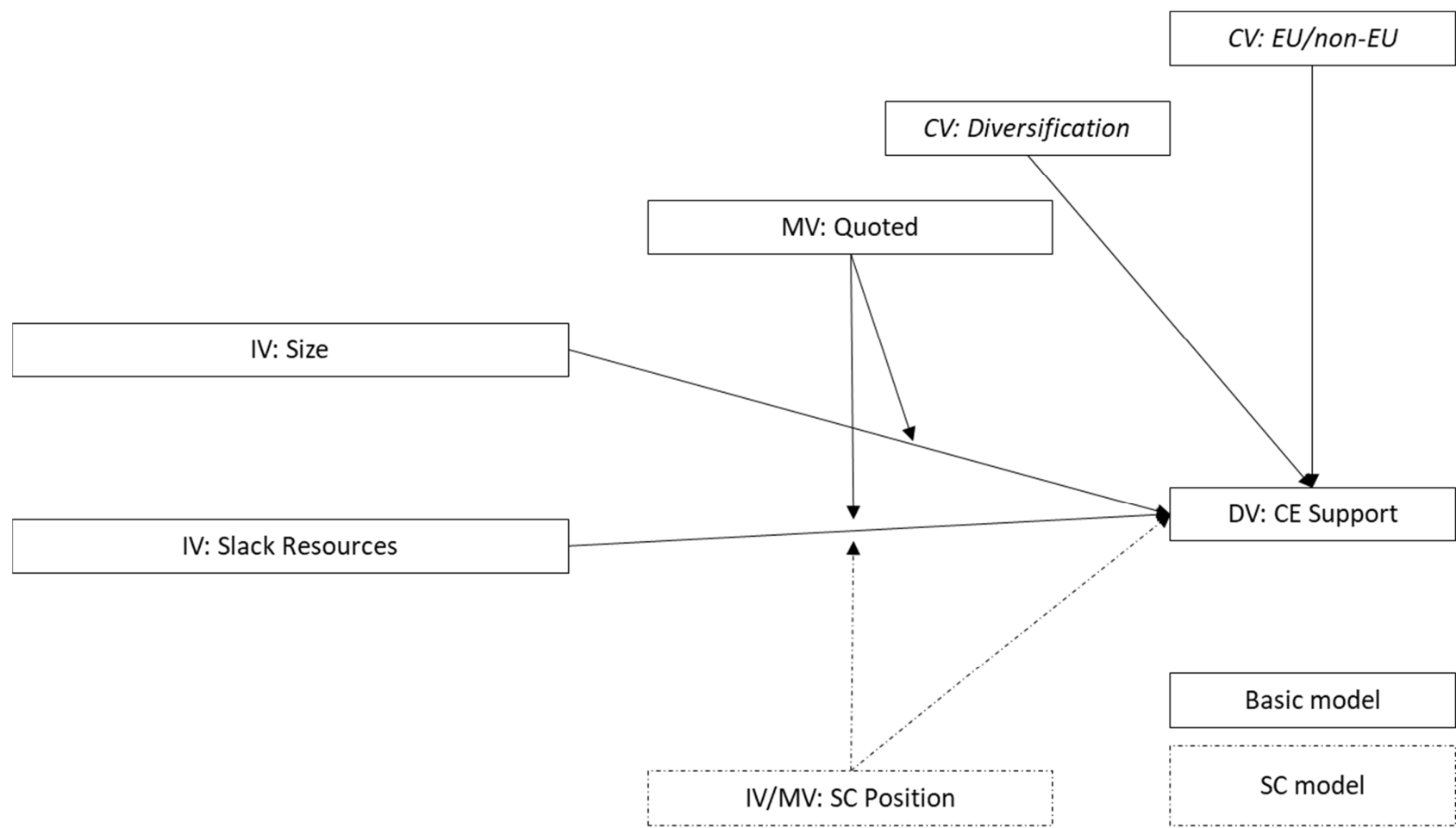


Figure 1. The research model of the regression framework. IV (Independent Variable), MV (Moderating Variable), CV (Control Variable), DV (Dependent Variable, CE (Circular Economy regulation), SC (Supply Chain)).

The study's first hypothesis refers to firm size as an independent variable. While earlier work on corporate sustainable development often uses firm size as control [88] we find it first of all relevant to understand the consistent association with the dependent variable. Hence, we explore whether size has a direct effect on firms' support for CE regulation. Taking a predominantly RBV of the firm, we build on other research analyzing the impact of firm size on corporate sustainability activities [72] that generally found that larger firms take on more environmental responsibility as they are subject to larger public scrutiny [89,90]. At the same time, larger firms develop more bureaucratic mechanisms and the cost to change these may be higher than for smaller firms who have fewer such control mechanisms in place [90]. In addition, smaller firms tend to be more agile [91], enabling them to transform their linear business models into circular business models relatively quickly. Hence, if smaller, potentially more dynamic organizations will have fewer struggles to adapt to CE regulations than slower, large corporations [92], they may expect to gain a competitive advantage through increased CE regulation. Similarly, from a game-theoretical point of view, smaller, more agile firms that can adapt to regulatory change faster would lobby for green regulation to give themselves an advantage over their larger competitors by capturing larger firms' market share when they cannot implement the regulatory requirements fast enough [7,93]. In addition, given that fewer employees are involved in smaller firms, resistance to change may be less of a burden [94]. While firm size may also stand for other aspects of a firm, we hypothesize the following based on the above reasons:

Hypothesis 1 (H1). *Firm size is negatively related to its support for CE regulation.*

Investing in and implementing the CE is a risky endeavor that requires the will to experiment. High amounts of slack resources compared to the firm's size reduce its investment risks [72,95]. Firms that have dynamic capabilities can generate slack resources faster than their less dynamic peers, so they are more likely to change their strategy to supporting environmental initiatives such as the CE [96,97]. Zhang et al. (2018) [98] also show that slack financial resources strongly correlate with CSR efforts. Accordingly, we formulate our second hypothesis:

Hypothesis 2 (H2). *A firm's slack resources are positively related to its support for CE regulation.*

In line with these proposals, we also formulate a moderation hypothesis that a stock listing increases a firm's support for CE regulation, as listed firms will want to keep their position in ESG (environmental, social, governance) ratings. Gallo and Christensen (2011) [90] show empirically that a firm's size and its stock market quotation are significantly positively related to its support of sustainability, and Loderer et al. (2010) [99] show that large and listed firms disclose a lot more information to shareholders than non-listed firms to render themselves attractive to investors, which is consistent with Buzby's (1975) [100] earlier findings. Because of the hypothesized negative relationship between firm size and CE support, we state our third hypothesis as:

Hypothesis 3 (H3). *Listing on a stock market increases the negative association between a firm's size and its support for CE regulation.*

Empirical evidence from the United Kingdom [101] and the United States [102] shows that listed firms have higher cash ratios (cash divided by total assets) than their unlisted peers. Cash is considered a slack resource [103]. Schoubben and Van Hulle (2004) [104] point in a similar direction, showing that firms that are listed on the stock market have comparatively less debt than private firms, suggesting that these firms have more slack resources. Therefore, we formulate our fourth hypothesis as:

Hypothesis 4 (H4). *Listing on a stock market increases the positive association between a firm's slack resources and its support for CE regulation.*

We also suggest a supply chain (SC) model in which we examine the role of a firm's position in the SC in its support of CE regulation. We formulate two hypotheses.

A specific SC position comes with a specific context, stakeholders, and regulations that explain variances in environmentally favorable behavior between actors along the SC [71,105]. Companies that are at the downstream end of the SC and whose brands are thus more visible to the end consumer [71,106–108] are penalized most for not adhering to environmental standards or causing environmental scandals. One example is the ongoing Volkswagen Dieselgate emissions scandal [109] and the Deepwater Horizon tragedy [110], where Volkswagen paid approximately three times as much as BP, even though BP may have caused more environmental damage. However, Volkswagen is closer to the end consumer, so it is exposed to a higher risk of punishment from the consumer. Both companies still suffer from reputational consequences [111], but Volkswagen has paid a higher price. We also expect companies that are engaged at the early steps of today's linear economy—that is, those that are involved in resource extraction—to feel the most disruption and need for adaptation during CE implementation. Therefore, these companies are most likely to oppose binding CE regulations. They would have to adapt quickly to CE regulations, incurring high transition costs and possibly even destroying their core business proposition.

Similarly, we argue that, from a game-theory perspective, firms could support CE regulations to hurt their direct competitors [7]. This especially holds if the firms they want to attack have a highly globalized or long SC because such SCs often have cost advantages. Accordingly, cost-conscious firms with shorter, more local SCs (sourcing closer to the end consumer) may use a CE-support strategy to hurt their globally acting competitors. We also find support for this logic from an RBV perspective, as supporting CE regulation could mean that being an early adopter and building critical expertise and capabilities in the CE would be a valuable resource [75]. Indeed, a firm's competitive advantage from supporting the CE will likely be based on a set of valuable and inimitable resources, as Fernando et al.'s (2018) [112] study of Malaysian firms with new renewable-energy SCs shows. The hypothesis positively connects the position in the SC and support of CE regulation because renewable-energy SCs are shorter and closer to the customer.

Hypothesis 5 (H5). *A downstream supply chain position is positively related to a firm's support for CE regulation.*

Hypothesis 6 (H6). *A downstream supply chain position increases the positive association between a firm's slack resources and its support for CE regulation.*

4. Research Methods

We first describe the data collection process. Next, we explain the deployed variables in the model, and lastly, we describe the data analysis approach of our investigation.

4.1. Data Collection

We combined data points from three sources. We collected EU Commission data on public consultations regarding CE in 2015. These data are publicly available on the EU Commission's website and can be retrieved in an Excel file containing text information. While these data also include public statements of non-governmental organizations and other institutions, this study focuses on private firms, so we limited our data set to the 142 private firms that disclosed their names. We also collected data on firm-level covariates – assets, number of employees, revenue, and industry from the Bureau van Dijk ORBIS database [113], which covers the last fiscal year preceding the public consultation (2014). Finally, based on a company's NAICS industry identifier, we connected our firm

data to a metric for SC position developed by Delgado and Mills (2020) [114] that measures how close NAICS industries are to the end consumer.

4.2. Measures

The following section describes dependent, independent, and control variables of the models.

4.2.1. Dependent Variable

We deployed the public positions the 142 companies took in the 2015 public consultations process, with the companies' names as the dependent variable. As companies' opinions are displayed in these public consultation files, we used seven questions asked in these public consultations to create a variable that captures the firms' support of CE regulations. We selected these questions based on their relevance to firms' positions regarding CE regulation and excluded purely descriptive (open text field) questions. Firms answered these questions on a Likert scale from 1 to 5, so we treated the questions as continuous variables and summed the answers to obtain our CE regulation-support index. Table 1 provides a list of these questions and their coding.

Table 1. Index for firms' support for CE regulation.

#	Question	Coding of Answers
1	Assess the importance of the following measure to promote circular economy principles in product design at the EU level: Establish binding rules on product design (e.g., minimum requirements on "durability" under Ecodesign Directive 2009/1).	From 5 = very important (highest support for CE regulation) to 1 = not important (least support)
2	Assess the importance of the following measure to promote circular economy principles in product design at the EU level: Encourage industry-led initiatives (i.e., self-regulation).	From 5 = very important (least support for CE regulation) to 1 = not very important (highest support)
3	Assess the importance of the following measure to promote circular economy principles in product design at the EU level: Develop standards for voluntary use.	From 5 = very important (least support for CE regulation) to 1 = not very important (highest support)
4	Should the action listed below be given priority at the EU level to promote circular economy solutions in production processes? Address potential regulatory obstacles in EU legislation.	From 5 = very important (least support for CE regulation) to 1 = not very important (highest support)
5	Should the action listed below be given priority at the EU level to promote circular economy solutions in production processes? Address potential regulatory gaps in EU legislation.	From 5 = very important (highest support for CE regulation) to 1 = not important (least support)
6	How effective do you think the action at the EU level listed below would be in promoting sustainable production and sourcing of raw materials? Establishing a legally binding framework at the EU level (e.g., sustainability criteria).	From 5 = very effective (highest support for CE) to 1 = not effective (least support)
7	How effective do you think the action at the EU level listed below would be in promoting sustainable production and sourcing of raw materials? Developing and promoting voluntary compliance schemes.	From 5 = very effective (least support for CE regulation) to 1 = not effective (highest support)

4.2.2. Independent Variables

The model's independent variables are the firm-level variables. *Firm size* is measured by either the number of employees or total assets. Both operationalizations are deployed as proxies for firm size to test for the respective measures' robustness. Both proxies are log-transformed to level out their skewed distributions. In line with previous studies [72,103,115], *slack resources* are calculated as the inverse ratio of debt to total assets. We employed stock market listing as a *quoted* variable, from the ORBIS data as a dummy variable coded as 1 when the firm is listed (i.e., a public company) and 0 if not.

We used the *SC position* (from Delgado and Mills, 2020 [114]) as an explanatory variable in our SC deep-dive model. The measure, which ranges from 0 to 1, proxies for how close the firm's industry is to the end consumer in the SC. Higher values signify closer proximity to the end consumer. We merged the data sets based on the NAICS identifiers [116].

4.2.3. Controls

We controlled for two variables, *EU/non-EU* and *business diversification*. We chose the variable *EU/non-EU* as a control, as Kennard (2020) [7] suggests that non-EU firms, i.e., firms with headquarters outside of the EU, could favor strict CE regulation to increase the regulatory burden of their EU competitors in their home markets. *EU/non-EU* is a binary measure coded as 0 for non-EU and 1 for EU. We also chose *business diversification* as a control, as a proxy for industry type [117]. The more diversified a company, the more diversified the risk for the firm as a whole, as some business activities may not be affected by CE regulation. Hence, we expect these firms to take a position less opposed to circular economy regulation than non-diversified firms. *Business diversification* ranges from one to eight active industries per firm, according to the self-reporting in the public consultation data set.

4.3. Data Analysis Approach

Our data analysis approach consists of five steps. First, we checked for missing values and calculated the descriptive statistics for all variables by creating a correlation matrix to check for strong bi-variate relationships and histograms to check for normal distributions. Second, we investigated the hypotheses empirically in a hierarchical regression framework [118] using ordinary least squares (OLS) estimation. We started by regressing CE support on the independent variables, then added the control variables to the model, and finally added interaction terms. This procedure was repeated for hypotheses 5 and 6 in a separate SC model. Third, we recalculated the models and replaced the employee variable with assets to assess the robustness of employees as a proxy for firm size. Fourth, we assessed the error terms of all models' regression outputs to validate essential OLS assumptions (i.e., regular distribution of error terms). Fifth, we assessed variance inflation factors to check for multicollinearity issues. Motivated by potential selection bias in our sample, we tested the robustness of our results further using a Heckman selection model [119].

The next section describes the results of each of these steps and provides descriptive statistics of the variables.

5. Results

This section provides the descriptive statistics of the data set, discusses the results, and presents the robustness tests.

5.1. Descriptive Statistics

Approximately half of our 142 data points have at least one missing entry. Missing values are common in survey research and lead to various challenges. A common response to missing values is list-wise deletion, where every incomplete data set is deleted. This procedure leads to a high amount of data loss and can lead to critically small sample sizes, which would have been the case for us had we not employed the multivariate imputation by chained equations (MICE) procedure introduced by Van Buuren and Groothuis-Oudshoorn (2011) [120] to preserve the sample size. This procedure draws values randomly from the underlying distribution and imputes them by means of predictive mean matching [120–122]. Unlike list-wise deletion or simple mean imputation, this procedure preserves the random variance of the complete data and offers plausible values that are assumed to be free of bias.

Not all 142 firms, such as professional services firms, have SC positions, so we excluded firms that did not have SC positions from the SC model, leading to a smaller sample of 124 firms. After completing our data set, we calculated means, standard deviations, and a correlation matrix (Table 3). Next, we checked for normal distributions of the individual variables of our data set by visually inspecting the histograms of each variable. Rahman and Govindarajulu (2010) [123] suggest using the Shapiro–Wilk test to assess the normality of the data further, which is especially important for smaller samples. The Shapiro–Wilk test is a significance test with the null hypothesis of a normally distributed population. A significance level of $p < 0.05$ is recommended as a cut-off value. As Table 2 shows,

normality of the data is given only for the *CE_Support* variable; the remaining variables are non-normally distributed.

Table 2. Histograms of variables and Shapiro–Wilk test statistics.

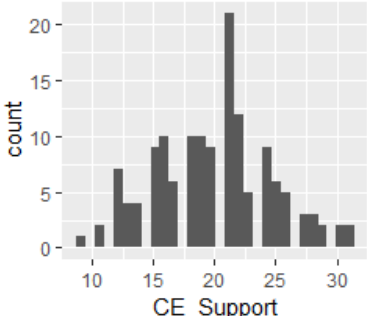
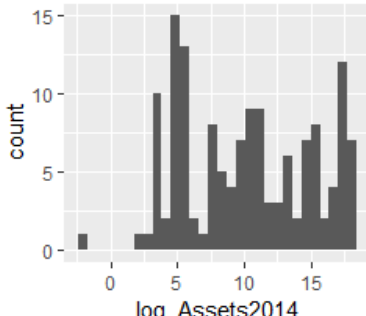
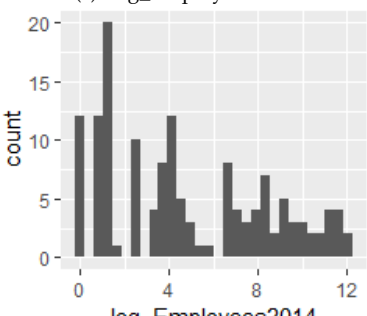
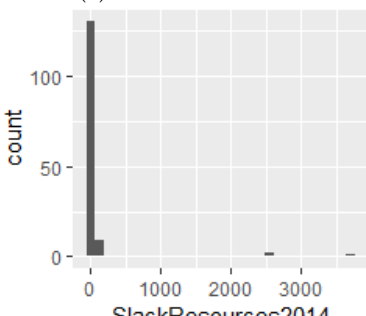
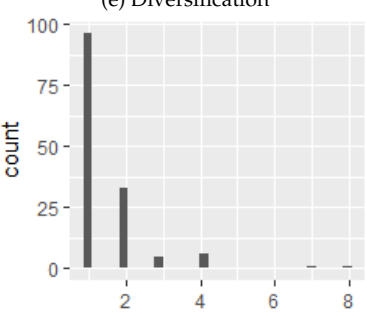
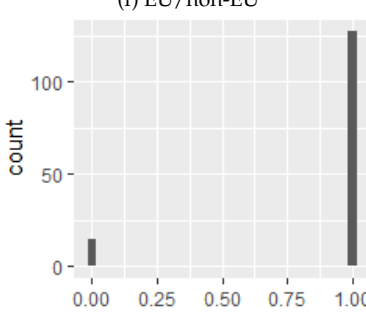
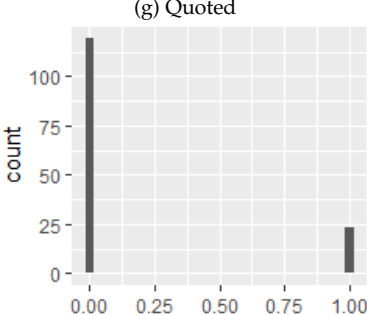
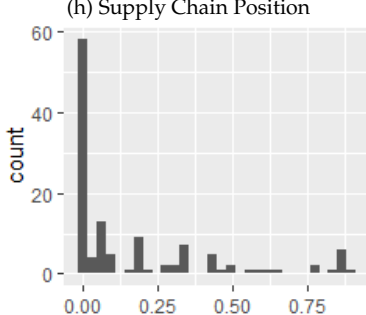
Histograms	(a) <i>CE_Support</i> 	(b) <i>Log_Assets2014</i> 
Statistics	$W = 0.9866, p\text{-value} = 0.1844$	$W = 0.9461, p\text{-value} = 2.624 \times 10^{-5}$
Histograms	(c) <i>Log_Employees2014</i> 	(d) <i>SlackResources2014</i> 
Statistics	$W = 0.91988, p\text{-value} = 3.894 \times 10^{-7}$	$W = 0.15765, p\text{-value} < 2.2 \times 10^{-16}$
Histograms	(e) <i>Diversification</i> 	(f) <i>EU/non-EU</i> 
Statistics	$W = 0.54351, p\text{-value} < 2.2 \times 10^{-16}$	$W = 0.35296, p\text{-value} < 2.2 \times 10^{-16}$
Histograms	(g) <i>Quoted</i> 	(h) <i>Supply Chain Position</i> 
Statistics	$W = 0.44293, p\text{-value} < 2.2 \times 10^{-16}$	$W = 0.71204, p\text{-value} = 2.791 \times 10^{-14}$

Table 3. Correlation matrix.

	# obs.	Mean ¹	SD ¹	CE_Support	Assets	Employees	SlackResources	EUorNot	Diversification	Quoted
CE_Support	142	19.9	4.7							
Assets	142	10.2	4.9	Cor: −0.364 (<i>p</i> : 0 ****)						
Employees	142	4.7	3.7	Cor: −0.38 (<i>p</i> : 0 ****)	Cor: 0.942 (<i>p</i> : 0 ****)					
SlackResources	142	73.9	424.5	Cor: −0.02 (<i>p</i> : 0.8151)	Cor: −0.065 (<i>p</i> : 0.4404)	Cor: −0.015 (<i>p</i> : 0.8638)				
EUorNot	142	0.9	0.3	Cor: −0.064 (<i>p</i> : 0.4521)	Cor: −0.165 (<i>p</i> : 0.0496 **)	Cor: −0.173 (<i>p</i> : 0.0397 **)	Cor: 0.056 (<i>p</i> : 0.5048)			
Diversification	142	1.5	1.0	Cor: 0.03 (<i>p</i> : 0.7226)	Cor: 0.02 (<i>p</i> : 0.8168)	Cor: 0.031 (<i>p</i> : 0.7176)	Cor: −0.022 (<i>p</i> : 0.7983)	Cor: −0.114 (<i>p</i> : 0.1758)		
Quoted	142	0.2	0.4	Cor: −0.223 (<i>p</i> : 0.0075 ***)	Cor: 0.564 (<i>p</i> : 0 ****)	Cor: 0.68 (<i>p</i> : 0 ****)	Cor: −0.063 (<i>p</i> : 0.4567)	Cor: −0.222 (<i>p</i> : 0.0079 ***)	Cor: 0 (<i>p</i> : 0.9976)	
SC_Position	124	0.2	0.3	Cor: −0.096 (<i>p</i> : 0.2897)	Cor: 0.098 (<i>p</i> : 0.2813)	Cor: 0.161 (<i>p</i> : 0.0734 *)	Cor: −0.04 (<i>p</i> : 0.6573)	Cor: −0.123 (<i>p</i> : 0.172)	Cor: −0.131 (<i>p</i> : 0.1468)	Cor: 0.169 (<i>p</i> : 0.0607 *)

**** *p* < 0.001; *** *p* < 0.01; ** *p* < 0.05; * *p* < 0.1. ¹ Rounded to first decimal.

After assessing univariate normality, we assessed multivariate normality using Mardia's (1970) [124] test because we employed a multiple regression procedure. The test statistics for skewness (Mardia Skewness = 1078, p -value = 0) and kurtosis (Mardia Kurtosis = 18, p -value = 0) both indicate a lack of support for the tests' null hypothesis of multivariate normally distributed data (Figure 2).

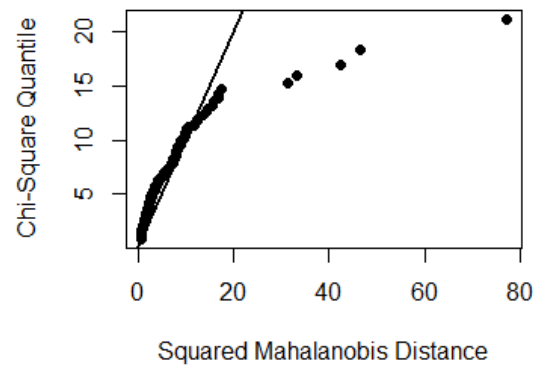


Figure 2. Chi-square Q-Q plot of multivariate normality.

We consider these findings unproblematic at this stage, given the central limit theorem, which posits that resampling of non-normally distributed data will result in a normally distributed probability distribution [125]. Nevertheless, these insights suggest being cautious concerning the regression models' error terms and critically assessing their normal distributions in detail. This ex-post validation of normally distributed error terms in OLS regression is a critical model assumption, as non-conformance is not covered by the central limit theorem.

5.2. Results of Hypotheses Tests

Table 4 shows our findings for Hypotheses 1–4, and Table 5 shows our findings for Hypotheses 5 and 6.

Table 4. Results: unstandardized regression coefficients.

	Control-Variable Model	IV-Only Model	Base Model	Interaction Model
Intercept	0 (0.08)	0 (0.08)	0 (0.08)	0.41 ** (0.17)
Diversification	0.02 (0.09)		0.03 (0.08)	0.05 (0.08)
EUorNot	−0.06 (0.09)		−0.13 (0.08)	−0.09 (0.08)
Employees		−0.38 *** (0.08)	−0.40 *** (0.08)	−0.62 *** (0.13)
SlackResources		−0.03 (0.08)	−0.02 (0.08)	0.11 (0.44)
Quoted				0.94 *** (0.34)
Employees × Quoted				−0.58 *** (0.21)
SlackResources × Quoted				0.29 (1)
R ²	0	0.14	0.16	0.21
Adj. R ²	−0.01	0.13	0.14	0.17
Num.obs.	142	142	142	142

Note: Standard errors are in brackets. *** $p < 0.01$; ** $p < 0.05$.

To summarize, in our first model, which excludes the SC position, two of four hypotheses are significant. H1 shows a significant negative effect in all three models of the hierarchical regression framework and is confirmed. Hypothesis 2 is not confirmed because the results do not show a significant positive effect between slack resources and CE support. Hypothesis 3 is significant and confirmed, suggesting that large, unlisted firms show low

support for CE regulation, whereas small, listed firms show high support for CE regulation. Figure 3 shows the moderation plot. In general, we find that listing on the stock market is significantly and positively related to support for CE regulation. Hypothesis 4 cannot be accepted because of a non-significant coefficient.

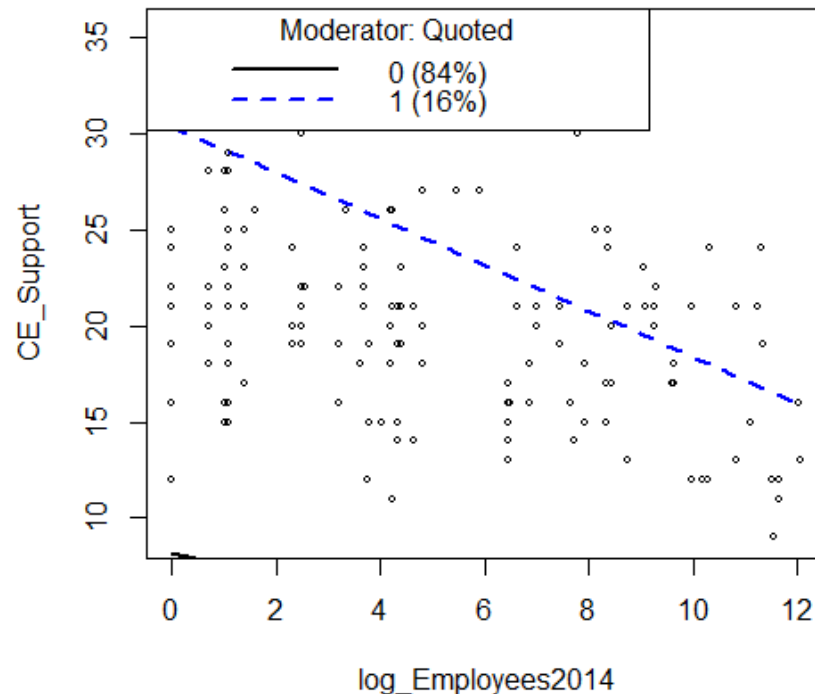


Figure 3. Moderation effect of stock market quotation on the Employees—CE-support relationship.

The Supply Chain model in Table 5 provides further support for Hypothesis 3, so a stock market listing is related to support for CE regulation, as shown in the previous models.

Table 5. Unstandardized regression coefficients (Supply Chain Model).

	Control-Variable Model	IV-Only Model	Base Model	Interaction Model
Intercept	20.61 *** (1.41)	22.43 *** (0.68)	25.12 *** (1.61)	23.43 *** (1.63)
Diversification	0.1 (0.38)		0.01 (0.37)	0.16 (0.35)
EUorNot	−0.93 (1.29)		−2.80 ** (1.30)	−1.76 (1.32)
Employees		−0.47 *** (0.11)	−0.51 *** (0.11)	−0.42 *** (0.16)
SlackResources		0 (0)	0 (0)	0 (0)
SC Position		−0.66 (1.55)	−0.98 (1.56)	2.32 (1.81)
Quoted				20.99 *** (7.70)
Employees × Quoted				−2.12 ** (0.74)
SlackResources × Quoted				0.01 (0.03)
SlackResources × SC Position				−0.05 ** (0.02)
R ²	0	0.14	0.18	0.27
Adj.R ²	−0.01	0.12	0.14	0.21
Num.obs.	142	124	124	124

Note: Standard errors are in brackets. *** $p < 0.01$; ** $p < 0.05$.

However, we do not find support for Hypothesis 5, as we find no significant relationship between a downstream position in the SC and support for CE regulation.

Table 5 also directs our attention to Hypothesis 6, where we find a significant effect, although the effect is small and in the opposite direction than hypothesized. Figure 4 shows that the relationship between a high amount of slack resources and CE support for the mean SC position is negative. However, this relationship becomes positive when the SC is far from the end consumer. In other words, firms with high amounts of slack resources and with a considerable distance from end consumers are likely to support CE regulation. This counterintuitive finding sheds new light on firms that are positioned upstream in the SC, which are usually considered polluters because of less visibility and less reputational risk derived from increased consumer awareness [126]. One possible explanation could stem from the overall increased public awareness that now also induces pressure on more upstream firms [127].

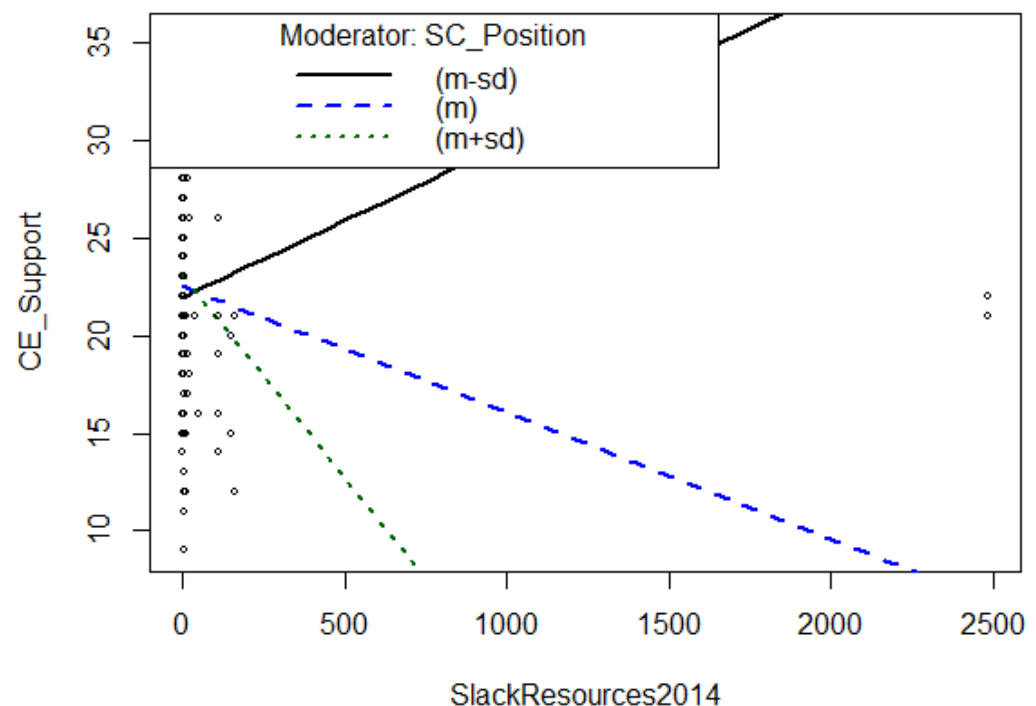


Figure 4. Moderation effect of SC Position on the Slack resources–CE-support relationship (based on employee model).

5.3. Tests for Robustness

After running our hierarchical regression models, we employed four procedures to test their quality ex-post: we assessed the robustness of the size indicator by recalculating the models with assets instead of employees, checked the normality of error terms, examined variance inflation factors to check for multicollinearity, and ran the Heckman model to account for the potential selection bias of the sample.

To check the robustness of the firm size measure, Tables 6 and 7 use assets, much as Tables 4 and 5 use the number of employees, to model firm size. Generally, the coefficients go in the same directions and reach the same significance levels. These results give us confidence that the initial models with the number of employees as a measure of firm size are robust.

Williams et al. (2019) [128] clarify that OLS estimation requires normally distributed error terms. We assessed the normality of the error terms quantitatively using the Shapiro–Wilk test and visually using Q–Q plots (Table 8). These results show that the models' error terms are normally distributed, suggesting reliable estimates.

Next, we check for multicollinearity. Variance inflation factors (VIFs) measure how much multicollinearity the independent variables bring into the model, that is, how much multicollinearity is caused by an individual independent variable. O'Brien (2007) [129]

argues that the typical threshold of $VIF > 10$ should be used with caution, especially for exploratory studies with small sample sizes. Only the interaction effect for being listed in a stock market causes concern (Tables 9 and 10). We elaborate on this topic in the limitations section.

To assess robustness further, we turned our attention to potential selection biases, as the EU Action Plan survey was filled out as “opt-in”, i.e., voluntarily by the respective firms. Furthermore, Podsakoff et al. (2003) [130] explain that non-anonymous survey responses are often biased for reasons related to social desirability and consistency. Accordingly, we recalculated each of the previous models using a Heckman selection model [119,131].

Here, we introduce the Heckman model; outline the set-up of our selection model; describe the results of the Heckman outcome models, which are all based on the same selection model, and compare them to our previous models’ outcomes; and assess the robustness of the models’ outcomes.

Table 6. Hierarchical regressions with assets as a proxy for firm size.

	Control-Variable Model	IV-Only Model	Base Model	Interaction Model
Intercept	20.61 *** (1.41)	23.55 *** (0.86)	25.26 *** (1.62)	24.61 *** (1.57)
Diversification	0.1 (0.38)		0.1 (0.36)	0.15 (0.34)
EUorNot	−0.93 (1.29)		−1.86 (1.22)	−1.83 (1.19)
Assets		−0.35 *** (0.08)	−0.37 *** (0.08)	−0.30 *** (0.09)
SlackResources		0 (0)	0 (0)	0 (0)
Quoted				43.34 *** (−12)
Assets × Quoted				−2.69 *** (−0.72)
SlackResources × Quoted				−0.01 (−0.03)
R ²	0	0.13	0.15	0.23
Adj.R ²	−0.01	0.12	0.13	0.19
Num.obs.	142	142	142	142

Note: Unstandardized coefficients are shown. Standard errors are in brackets. *** $p < 0.01$.

Table 7. Hierarchical regressions with assets as a proxy for firm size for the SC models.

	Control-Variable Model	IV-Only Model	Base Model	Interaction Model
Intercept	20.61 *** (1.41)	23.98 *** (0.96)	26.75 *** (1.78)	25.18 *** (1.71)
Diversification	0.1 (0.38)		−0.03 (0.37)	0.08 (0.34)
EUorNot	−0.93 (1.29)		−2.73 ** (1.30)	−2.29 ** (1.25)
Assets		−0.37 *** (0.08)	−0.39 *** (0.08)	−0.30 *** (0.10)
SlackResources		0 (0)	0 (0)	0 (0)
SC Position		−1.11 (1.53)	−1.48 (1.55)	−2.10 (1.74)
Quoted				44.55 *** (11.73)
Assets × Quoted				−2.80 *** (0.71)
SlackResources × Quoted				−0.00 (0.02)
SlackResources × SC Position				−0.06 *** (0.02)
R ²	0	0.14	0.18	0.31
Adj.R ²	−0.01	0.12	0.14	0.25
Num.obs.	142	124	124	124

Note: Unstandardized coefficients are shown. Standard errors are in brackets. *** $p < 0.01$; ** $p < 0.05$.

Table 8. Shapiro–Wilk test of error terms and corresponding normal Q–Q plots.

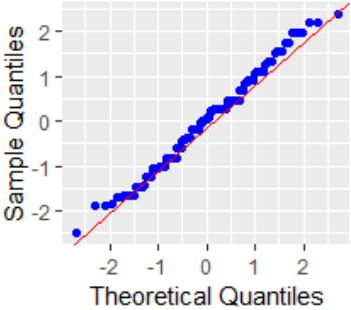
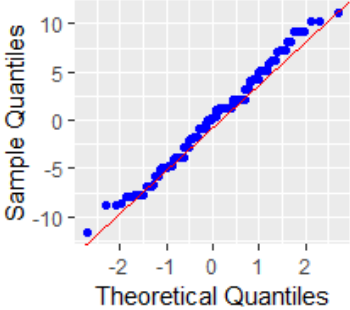
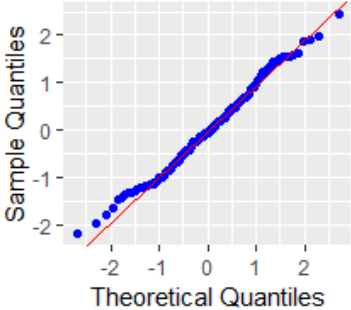
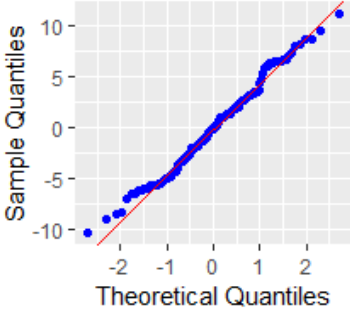
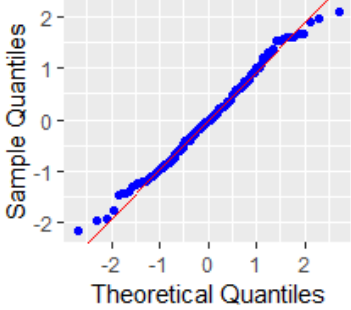
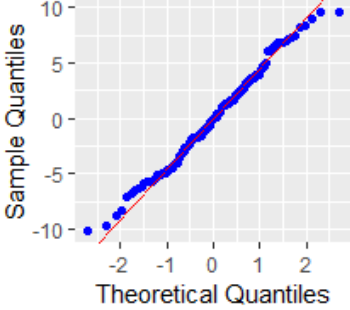
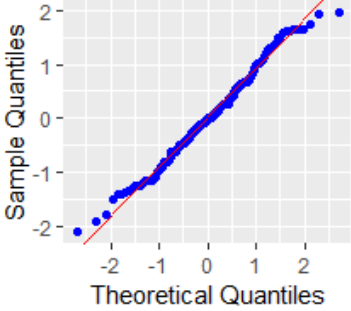
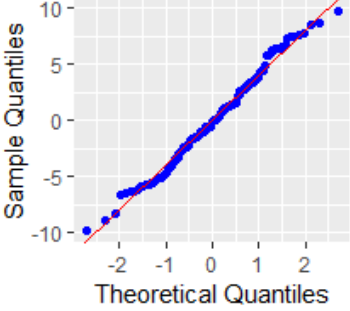
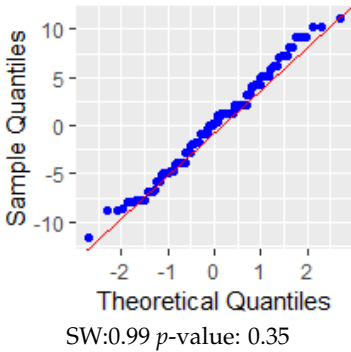
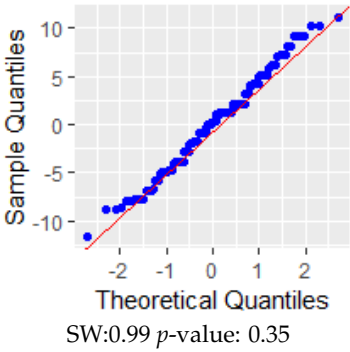
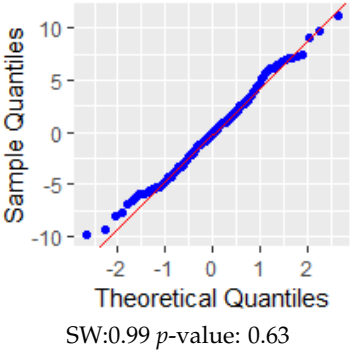
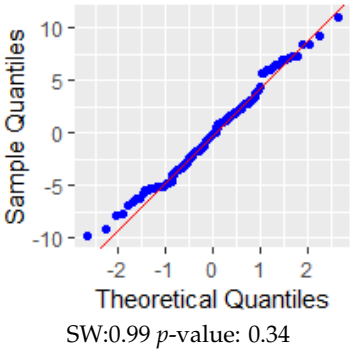
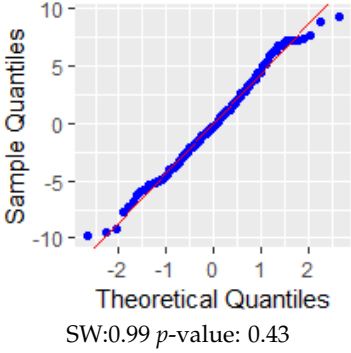
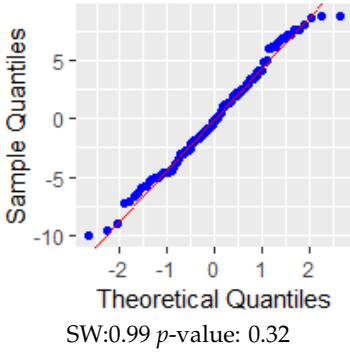
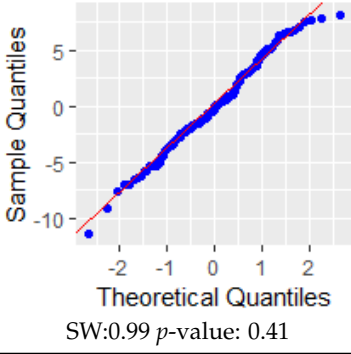
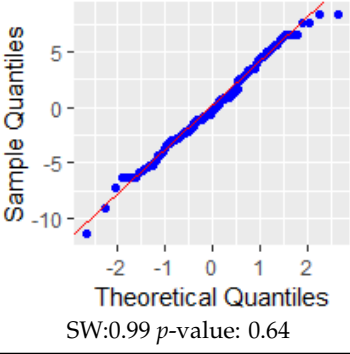
Basic Models	Test Statistics and Q–Q Plot: Employee Models	Test Statistics and Q–Q Plot: Asset Models
Control variable model	 SW:0.99 p-value: 0.35	 SW:0.99 p-value: 0.35
IV-only model	 SW:0.99 p-value: 0.44	 SW:0.99 p-value: 0.31
Base model	 SW:0.99 p-value: 0.38	 SW:0.99 p-value: 0.37
Interaction model	 SW:0.99 p-value: 0.29	 SW:0.99 p-value: 0.36

Table 8. Cont.

SC-Deep-Dive Models	Test Statistics and Q–Q Plot: Employee Models	Test Statistics and Q–Q Plot: Asset Models
Control variable model	 SW:0.99 p-value: 0.35	 SW:0.99 p-value: 0.35
IV-only model	 SW:0.99 p-value: 0.63	 SW:0.99 p-value: 0.34
Base model	 SW:0.99 p-value: 0.43	 SW:0.99 p-value: 0.32
Interaction model	 SW:0.99 p-value: 0.41	 SW:0.99 p-value: 0.64

Note: SW = Shapiro–Wilk test statistic.

Table 9. Assessment of variance inflation factors for the employee model.

	Basic Models				SC Models			
	Control-Variable Model	IV-Only Model	Base Model	Interaction Model	Control-Variable Model	IV-Only Model	Base Model	Interaction Model
Diversification	1.01		1.01	1.03	1.01		1.04	1.06
EUorNot	1.01		1.05	1.11	1.01		1.06	1.17
Employees		1.00	1.03	2.76		1.04	1.06	2.32
SlackResources		1.00	1.00	33.51		1.01	1.02	1.22
SC Position						1.03	1.06	1.55
Quoted				19.93				64.25
Employees × Quoted				13.43				65.47
SlackResources × Quoted				35.59				1.20
SlackResources × SC Position								1.60

Table 10. Assessment of variance inflation factors for the asset model.

	Basic Models				SC Models			
	Control-Variable Model	IV-Only Model	Base Model	Interaction Model	Control-Variable Model	IV-Only Model	Base Model	Interaction Model
Diversification	1.01		1.01	1.02	1.01		1.04	1.05
EUorNot	1.01		1.04	1.08	1.01		1.05	1.12
Assets		1.00	1.03	1.50		1.05	1.07	1.83
SlackResources		1.00	1.01	1.01		1.04	1.05	1.26
SC Position						1.01	1.05	1.53
Quoted				157.10				158.20
Assets × Quoted				155.67				158.61
SlackResources × Quoted				1.26				1.26
SlackResources × SC Position								1.60

The Heckman selection model [119,131] follows the idea that certain characteristics are common to the sample n but are not common in the overarching population N . Accordingly, Heckman (1976) [119] formulates

$$y_i^* = x_i' \beta + \mu_i \quad (1)$$

$$s_i^* = z_i' \gamma + \vartheta_i \quad (2)$$

where y_i^* and s_i^* are unobserved latent variables, and x_i' and z_i' are vectors of the explanatory variables. Equation (1) describes the selection process, and Equation (2) is the model of research interest. Heckman proposes using a Probit model to describe the selection:

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0 \\ 0 & \text{if } y_i^* \leq 0 \end{cases} \quad (3)$$

The Probit model yields the inverse Mills ratio $\lambda(\cdot) = \phi(\cdot)/\Phi(\cdot)$, which enters the outcome model to account for the selection bias [132,133]. The outcome model is a two-step set-up that is calculated with the OLS estimator.

The Heckman procedure also tests the MICE procedure for its consistency and robustness: Koné et al.'s (2019) [133] simulation study shows that MICE procedures can yield biased estimates, while Heckman procedures yield unbiased estimates. In other words, the use of a Heckman procedure is also an ex-post test for MICE procedures.

Our probit model regresses a binary “anonymity” variable on three variables: self-identification as a small or medium-sized enterprise (SME), diversification of business, and headquarters located in the EU. The data for the selection model consist of 210 observations (Table 11).

Table 11. Correlation, standard deviations, and means for the Heckman model.

	Mean	SD	CE_Support	Assets	Employees	SlackResources	EUorNot	Diversification	Quoted	SME
CE_Support	19.67	4.66								
Assets ¹	9,035,061	19,712,317	−0.428 ($p: 1 \times 10^{-4}$ ****) n = 78							
Employees ¹	18,634	38,892	−0.422 ($p: 3 \times 10^{-4}$ ****) n = 68	0.69 ($p: 0$ ****) n = 71						
SlackResources	94,33	513,48	−0.013 ($p: 0.9159$) n = 66	−0.068 ($p: 0.5649$) n = 74	−0.058 ($p: 0.6541$) n = 62					
EUorNot	0.89	0.31	0.1 ($p: 0.1785$) n = 182	−0.137 ($p: 0.197$) n = 90	−0.125 ($p: 0.284$) n = 75	0.061 ($p: 0.6045$) n = 74				
Diversification	1.53	1.19	−0.004 ($p: 0.9584$) n = 182	−0.038 ($p: 0.7241$) n = 90	0.146 ($p: 0.2117$) n = 75	−0.002 ($p: 0.9891$) n = 74	−0.163 ($p: 0.0178$ **) n = 210			
Quoted	0.11	0.31	−0.194 ($p: 0.0086$ ***) n = 182	0.484 ($p: 0$ ****) n = 90	0.67 ($p: 0$ ****) n = 75	−0.107 ($p: 0.3659$) n = 74	−0.17 ($p: 0.0137$ **) n = 210	−0.003 ($p: 0.9607$) n = 210		
SME	0.52	0.50	0.335 ($p: 0$ ****) n = 182	−0.403 ($p: 1 \times 10^{-4}$ ****) n = 90	−0.301 ($p: 0.0088$ ***) n = 75	0.006 ($p: 0.9603$) n = 74	0.151 ($p: 0.029$ **) n = 210	−0.073 ($p: 0.2905$) n = 210	−0.334 ($p: 0$ ****) n = 210	
SC_Position	0.11	0.22	−0.001 ($p: 0.9871$) n = 165	0.228 ($p: 0.0348$ **) n = 86	0.368 ($p: 0.0015$ ***) n = 72	−0.047 ($p: 0.696$) n = 71	−0.092 ($p: 0.2032$) n = 191	−0.087 ($p: 0.2308$) n = 191	0.253 ($p: 4 \times 10^{-4}$ ****) n = 191	−0.102 ($p: 0.1621$) n = 191

**** $p < 0.001$; *** $p < 0.01$; ** $p < 0.05$. ¹ Rounded to full number.

The outcome models for Hypotheses 1, 2, 3, and 4—number of employees or assets as proxies for firm size—are summarized in Tables 12 and 13. Tables 14 and 15 summarize the outcomes models that address Hypotheses 5 and 6.

Table 12. Outcome models for H1 (with number of employees) from the Heckman selection model.

	Control-Variable Model	IV-Only Model	Base Model	Interaction Model
Intercept	−5.07 (7.32)	−0.28 (0.59)	−0.28 (0.58)	−0.85 (0.98)
Diversification	0 (0.44)		0.20 (0.18)	0.20 (0.18)
EUorNot	−0.07 (0.49)		−0.07 (0.13)	−0.07 (0.14)
Employees		−0.38 *** (0.12)	−0.41 *** (0.12)	−2.38 (2.14)
SlackResources		−0.09 (0.13)	−0.10 (0.13)	1.07 (1.44)
Quoted				0.89 (0.76)
Employees × Quoted				0.68 (0.76)
SlackResources × Quoted				3.26 (4.10)
Inverse Mill's ratio	8.93 (12.73)	0.15 (0.69)	0.15 (0.68)	0.00 (0.76)
R ²	0.11	0.18	0.20	0.22
Adj. R ²	0.09	0.14	0.12	0.09
Num.obs.	193	125	125	125

Note: Standard errors are in brackets. *** $p < 0.01$.

Table 13. Outcome models for H1 (with assets) from the Heckman selection model.

	Control-Variable Model	IV-Only Model	Base Model	Interaction Model
Intercept	−5.07 (7.32)	−0.58 (0.80)	−0.53 (0.79)	−0.53 (0.88)
Diversification	0 (0.44)		0.01 (0.13)	0.03 (0.13)
EUorNot	−0.07 (0.49)		−0.10 (0.13)	−0.12 (0.14)
Assets		−0.39 *** (0.12)	−0.41 *** (0.12)	−0.14 (0.17)
SlackResources		−0.04 (0.11)	−0.04 (0.11)	0.04 (0.14)
Quoted				0.04 (0.69)
Assets × Quoted				−0.17 ** (0.08)
SlackResources × Quoted				0.23 (4.11)
Inverse Mill's ratio	8.93 (12.73)	0.65 (0.99)	0.59 (0.97)	0.78 (1.04)
R ²	0.11	0.19	0.20	0.26
Adj. R ²	0.09	0.15	0.13	0.16
Num.obs.	193	134	134	134

Note: Standard errors are in brackets. *** $p < 0.01$; ** $p < 0.05$.

The results show consistent support for both proxies for the size variable in the base models. However, adding the quoted variable and the associated interaction terms destabilizes the effect sizes and significance levels. We attribute these changes to the quoted variable, so we are confident in accepting Hypothesis 1 because of the identified effect and robustness.

As for Hypothesis 2, all models confirm that Hypothesis 2 cannot be accepted. It seems that slack resources and CE support are uncorrelated.

Table 14. Outcome models for H2 (with number of employees) from the Heckman selection model.

	Control-Variable Model	IV-Only Model	Base Model	Interaction Model
Intercept	−5.07 (7.32)	−1.49 (0.92)	−1.49 (0.92)	−1.45 (1.50)
Diversification	0 (0.44)		0.18 (0.19)	0.20 (0.19)
EUorNot	−0.07 (0.49)		−0.06 (0.13)	−0.06 (0.14)
Employees		−0.39 (0.12)	−0.41 *** (0.12)	−1.92 (2.17)
SlackResources		−5.45 (3.09)	−5.44 (3.11)	−1.11 (8.33)
SC Position		0.04 (0.13)	0.05 (0.13)	−1.17 (0.50)
Quoted				1.21 (0.82)
Employees × Quoted				0.51 (0.77)
SlackResources × Quoted				5.33 (4.30)
SlackResources × SC Position				−0.93 (2.90)
Inverse Mill's ratio	8.92 (12.73)	0.48 (0.78)	0.48 (0.77)	0.49 (0.89)
R ²	0.11	0.22	0.24	0.27
Adj.R ²	0.09	0.16	0.14	0.10
Num.obs.	193	122	122	122

Note: Standard errors are in brackets. *** $p < 0.01$.**Table 15.** Outcome models for H2 (with assets) from the Heckman selection model.

	Control-Variable Model	IV-Only Model	Base Model	Interaction Model
Intercept	−5.07 (7.32)	−0.62 (0.93)	−0.54 (0.91)	−1.09 (1.16)
Diversification	0 (0.44)		0 (0.13)	0.04 (0.15)
EUorNot	−0.07 (0.49)		−0.15 (0.13)	−0.11 (0.16)
Assets		−0.49 *** (0.13)	−0.52 *** (0.13)	−0.28 (0.33)
SlackResources		0.03 (0.19)	0.04 (0.19)	−0.14 (1.54)
SC Position		−0.03 (0.11)	−0.06 (0.11)	−0.28 * (0.15)
Quoted				0.39 (0.74)
Assets × Quoted				−0.12 (0.13)
SlackResources × Quoted				2.05 (4.30)
SlackResources × SC Position				−1.79 ** (0.87)
Inverse Mill's ratio	8.92 (12.73)	0.65 (1.13)	0.56 (1.10)	1.30 (1.35)
R ²	0.11	0.24	0.26	0.32
Adj.R ²	0.09	0.19	0.19	0.19
Num.obs.	193	131	131	131

Note: Standard errors are in brackets. *** $p < 0.01$; ** $p < 0.05$; * $p < 0.1$.

Adding the quoted variable to the model and measuring the hypothesized effects yield mixed results, as the effects are significant and in the hypothesized direction in both initial models, but the effects and standard errors in the asset model seem unusually high. This effect is present only in the non-Heckman model that uses assets for firm size. The Heckman models' effects are non-significant and have the usual standard errors, so we cannot accept with confidence Hypothesis 3's assertion that a stock market listing moderates the negative relationship between firm size and support for CE regulation.

In all models, the effect proposed in Hypothesis 4 is non-significant, confirming that Hypothesis 4, which proposes that a stock market listing moderates the relationship between slack resources and CE regulation support, is not supported.

The effect of a firm's position in its SC on its support for CE is consistently non-significant. However, in the Heckman models, some of the effects change their signs, so Hypothesis 5 is not supported.

In both initial models, the moderation effect of the firm's position in its SC on the relationship between the firm's slack resources and its support for CE is negative and significant. The negative sign is also found consistently in the Heckman models, but in the Heckman model that uses the number of employees for firm size, the effect is non-significant and has a high standard error, possibly signaling measurement or model convergence issues. After this additional analysis, we feel more confident in identifying a counter-intuitive effect for Hypothesis 6's proposal that a more downstream position in a firm's SC increases the positive association between slack resources and support for CE regulation than we did after our initial analysis.

Finally, we checked the robustness of the robustness models themselves. As we used the OLS estimator, we validated the normal distribution assumption of the error terms by employing the Shapiro–Wilk test and visually inspecting the Q–Q plots. None of the tests is significant and the Q–Q plots look satisfactory, providing confidence in our previous analyses. A table displaying these results, i.e., Q–Q plots and Shapiro–Wilk tests of the residuals for the Heckman outcome models can be made available upon request, but have been omitted in this version due to space constraints.

6. Discussion

This research advances the CE literature by providing evidence of what drives firms' support of CE regulation. We contribute to the CE literature and also contextualize it with the RBV of the firm, which leads to insights into the firm's non-market behavior in the environmental sustainability context. Our research also provides practical contributions at the policy and firm levels that encourage a more systemic perspective of CE research.

We present three findings: First, we found evidence that smaller firms show stronger support for CE regulation than larger firms do. Second, while not significant throughout all models, we found evidence that a firm's being listed on the stock market is an antecedent of support for CE regulation and its influence as a moderating factor that increases smaller firms' support for CE regulation. Third, we presented counterintuitive findings that firms that are farther away from the consumer in their SCs and that have high amounts of slack resources tend to have more support for CE regulation than do firms that have a position in their SCs that are closer to the consumer.

We discuss the theoretical and practical implications of these three findings in the next section.

6.1. Theoretical Implications

Our first finding, that smaller firms show more support for CE regulation than large firms do, suggests that the theory that smaller organizations tend to be more agile than larger ones and expect higher pay-off from CE regulation, is supported [91,134,135]. Thus, this finding contributes to the literature of agile organizations in the context of RBV and corporate environmental sustainability [7,92,93]. The finding is also of value since other research finds that larger firms, which tend to have more financial resources, tend to invest more in sustainability efforts than smaller firms do [136–139]. Despite the “agile advantage” smaller firms have over potentially slower and larger firms, one could interpret smaller firms' stronger support for CE regulation as a way small firms can increase their access to funding that might enable them to invest in sustainability initiatives. However, firm size may stand for many firm aspects and hence investigating other potentially related variables, such as ownership structure, might be necessary to better understand this relationship.

Even though it is not significant in all robustness models, the moderation effect of a stock market listing on the relationship between firm size and support for CE regulation points to the importance of access to capital in the CE context. The identified direction of the (non-significant) effect contributes to the value of the RBV of the firm, as this result suggests that financial resources are vital in making the CE a reality in the private sector [136]. However, given the non-significant effect in the Heckman selection model, we should not overinterpret this effect.

The other significant moderation effect—that a more upstream position in the SC increases the positive association between slack resources and support for CE regulation—contributes to the intersection of the SC management literature, the slack resources literature, and the CPA literature in the CE context. This moderation effect is counterintuitive, as other studies find that a position in the SC that is closer to the consumer tends to increase a firm's environmental welfare activity. Therefore, we understand that slack resources are only one contributor to a firm's support for CE regulation if the firm holds a more upstream position in its SC. While one could argue that firms that are positioned upstream would support CE regulation only if they have enough slack resources, we suggest that future research investigates this topic further before drawing conclusions. One reason could for example stem from the increasing compliance pressure of large corporations in the B2B context that forces companies (also those farther away from consumers) to increase sustainability standards.

We do not find support for Hypothesis 5, as we find no significant relationship between a downstream position in the SC and support for CE regulation. Bozarth et al. (2009) [140] provide a possible explanation in showing that the complexity of a SC is negatively associated with performance in a manufacturing plant, especially if the complexity is dynamic. Their results suggest that upstream complexity has a larger impact than downstream complexity and that firms that are closer to the end consumer will be impacted more by CE regulation because such regulation provides room to attack longer upstream SCs. A theoretical explanation for a null result could be that a paradigm change toward more sustainability [39] is agnostic to position in a SC, so that position does not affect a firm's support for CE. Another explanation stems from the fact that firms tend to become more vertically integrated if they expect more extensive benefits [141]. These firms are positioned along the entire SC, so they cannot be located in just one position.

6.2. Practical Implications

Our paper offers valuable insights for practitioners in policy-making and firm management. For policy-makers, our findings suggest that tailoring policies to specific firm sizes is a promising way to maximize adoption of and adherence to future CE regulation. These findings also have implications for how policy-makers engage and communicate with different types of firms. For example, while smaller firms may be intrigued by the idea of CE regulation, larger firms need additional targeted communication, especially because the environmental impact of large firms is generally higher than that of small firms. Hence, inviting large firms to policy discussions and proactively engaging them in policy-shaping can help to advance the adoption of CE principles.

Furthermore, even though the findings on the moderation effect of a stock market listing on the relationship between firm size and support for CE regulation were not significant in all robustness models, our results should sensitize policy-makers to capital market structures' regulating effects (e.g., through ESG ratings). Hence, instead of targeting firms directly with regulation, another promising area of regulation and collaboration lies in stricter capital market ESG ratings [142]. Access to further funding on the capital markets [143] can motivate support for CE regulation firms' adoption of CE principles. These preliminary findings should also sensitize policy-makers to how they can target non-listed firms, as these firms' motivation for supporting CE activities might be lower, given that capital market ESG regulations do not give them incentive to do so.

Our paper also provides insights for managers that may alert them to the potential impact of CPA in the CE context. The study may increase managers' awareness of how other firms position themselves regarding support for CE regulation, depending on their size. Having such awareness can bring managers valuable insights into a firm's competitive landscape and the potential market dynamics that may arise from CE regulations. Managers should also keep an eye open for further CE regulation and its potential impact on ESG ratings and access to capital, given that ESG ratings are an active field of policy regulation. Finally, we suggest that firms aim to be ahead of the curve by becoming more circular before regulation hits and they have advantages over late movers. This approach would also lead to earlier positive environmental outcomes.

7. Limitations and Future Research

Because of the data set and complexity of the research question, we discuss four limitations that lead to suggestions for future research. We also propose avenues for future research beyond these limitations.

First, issues related to the granularity of measurement of selected variables arise from using the NAICS codes for industry classification, as we cannot differentiate whether firms cater to customer segments with or without dedicated business units. Future research that can capture a more granular view on customer segments would be useful in challenging our results.

Second, the hierarchical regression framework does not confirm all of our hypothesized relationships. While no effect is possible, the finding of no effect could also mean that the method used was not sufficient. In addition, the CE concept needs to be addressed on various levels, from the level of the individual mindset to intra- and interfirm levels and global policy levels, which brings an extremely high level of complexity to the research field. Accordingly, a method that can cope better with high complexity, such as fuzzy-set qualitative comparative analysis (fsQCA) [144], might yield clearer results.

Third, some of the questions asked in the survey were not clear in showing participants how to interpret the scale. In particular, questions six and seven, which contributed to our CE support index, had ambiguous choices for participants: the position of "no opinion" and "neutral" was not explained to participants, as whether "no opinion" actually meant "no opinion" and should be excluded from the analysis or was somewhere in the middle of the scale was not clear. Future surveys should avoid such ambiguity by clearly showing the choices on a scale or using more precise formulations.

Finally, the VIFs of our moderation effects are beyond the threshold of 10. As Robinson and Schumacker (2009) [145] show, centering has a major impact on VIFs, which would likely decrease our VIFs significantly, maybe even under the threshold. However, centering would change the interpretation of the variables from their natural units to standard deviations, and we decided to forgo this approach.

Beyond these limitations and implications for future research, we have suggestions for further qualitative and quantitative empirical research. In particular, we suggest investigating additional external factors, internal micro-foundations, and their relationship to firm performance as an outcome. Finally, we suggest applying our data set to additional research questions.

For example, given that this study deploys primarily the internally oriented RBV of the firm to formulate hypotheses, future research could also incorporate external factors such as environmental dynamism and industry munificence as controls or potential moderators [72,146,147]. To eventually achieve the Sustainable Development Goals, it is also quite relevant in today's environment to understand how the context of COVID-19 [148,149] and external factors such as sustainability assessment [150,151] have influenced firms' support for CE regulation in the EU.

Analyzing the micro-foundations for CE regulation support is also a promising future avenue for research. As research on CSR suggests, top management's orientation toward sustainability and a visionary approach are significant drivers of CSR [61,152]. Managers'

values and long-term orientation foster sustainable initiatives and pay off in the end (e.g., [153]). Indeed, when it comes to firm performance as an outcome variable, studies support the finding that it pays to be green (e.g., [65,154]). Accordingly, we also expect a positive relationship between a firm's support of CE regulation, an environmentally positive CPA [55], and various organizational performance indicators, at least in the long run.

Finally, the data set of public consultations and the derived indicator of support for CE regulation that are deployed in this study could also be used to test more common ESG indicators [155]. As some of these indicators may be based on firms' potentially "greenwashed" sustainability reports [156], the CE regulation support indicator formed by the public consultation data set could challenge these indicators and point out potential discrepancies [157].

8. Conclusions

While our analysis can be considered only the beginning of a much-needed investigation into the intersection of CPA and CE, we believe that this analysis is critically important to stakeholders such as practitioners in policy-making and management, as well as academics. Our findings sensitize policy-makers to the need to design programs that are tailored to certain types of firms, such as firms of different sizes, firms with different positions in their SCs, and firms that have stock market listings.

Furthermore, the null findings regarding the direct relationship between slack resources and support for CE regulation and the significant moderation of a firm's position in its SC in terms of that relationship highlight the field's complexity in investigations of the interaction level of firms and policy-makers. This result is also counterintuitive, as it contradicts the understanding that firms that are farther away from the end consumers tend to care less about CE regulation because of their relative invisibility.

In addition to discussing these theoretical and practical implications, we set out our paper's limitations and suggested a research agenda of factors that should be investigated to determine what drives a firm's support for CE regulation and what influences these relationships.

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