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Determinants and value of corporate social responsibility management: Empirical evidence from the insurance industry

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Abstract

The aim of this paper is to empirically study corporate social responsibility management in the insurance industry, which has received increased attention in recent years. For this purpose, we use data from LSEG (former REFINITIV) over a period of 11 years (2010–2020) taking into account companies from the United States, Europe, China, and Japan, and analyze the determinants and the value of corporate social responsibility management. Our results show that larger insurers exhibit significantly better corporate social responsibility management. Moreover, focusing on the recent past we find an indication of the value-relevance of a holistic corporate social responsibility management. Hence, our findings reveal that it might be economically rational for insurance companies to become more sustainable. Therefore, it might be that the insurance market is able to move towards a more sustainable direction on its own, finally, reducing the importance of regulatory interventions in this regard.

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1 | INTRODUCTION

The latest report of the Intergovernmental Panel on Climate Change reveals that the global surface temperature has risen over the past few decades, and weather extremes such as fires or floods are becoming more frequent (see IPCC, 2021). Due to claims payments, insurance companies are directly affected by the increasing number of extreme weather events. One of the latest examples is the German flood disaster of July 2021, which caused insurance damage of over eight billion Euro (see GDV, 2021a). Hence, supervisory authorities like European Insurance and Occupational Pensions Authority (EIOPA) aim to ensure that insurance companies integrate sustainability in their risk management, by expanding the focus on environmental, social and governance (ESG) risks (see BaFin, 2019; EIOPA, 2022).

While the impact of the primary and secondary sector may be obvious, the financial industry and especially insurance companies can have a huge impact on sustainable development. One main reason is sustainability in asset management. Many insurance companies are among the largest institutional investors, and, for instance, the assets of US insurance companies in 2019 amounted to more than half of GDP of the United States (see OECD, 2020). By directing financial flows to more sustainable companies, countries, and projects, insurance companies are able to create incentives to encourage all market participants to be more sustainable. However, sustainable asset management is just one dimension of a sustainable insurance company, and the management of all the activities of a company, in general, that may affect sustainability, is often referred to as corporate social responsibility (CSR) management (see Carroll, 1999; Cini & Ricci, 2018; Pollman, 2021)¹; in our case, this also includes, for example, sustainable insurance products and sustainable offices, as insurance nowadays has to meet specific customer expectations and is no longer a simple transfer of risk (see Rieger-Fels, 2024).

From a social and macroeconomic point of view, it would therefore be desirable for insurance companies to behave in a sustainable manner and to implement a far-reaching CSR management. In this context, two questions arise. First, which conditions would prompt insurance companies to implement such far-reaching CSR management? Investigating the determinants of CSR management might facilitate a better understanding as to which insurance companies opt for far-reaching CSR management, consequently providing supervisory authorities with important information for control. Second, is CSR management creating economic value for the insurance company? Indications of value-relevance might act as economic incentives, encouraging insurance companies to act more sustainably, since insurance companies are economic undertakings and their strategy is primarily driven by economic aspects (e.g., maximizing shareholder value for listed companies). However, a lack of value-relevance might emphasize the importance of external incentives, for example, by means of guidelines established by supervisory authorities.

Focusing on sustainability in the insurance industry, Gatzert et al. (2020) and Stechemesser et al. (2015) provide an overview of risk and opportunities for insurance companies, related to sustainability. Moreover, Gatzert and Reichel (2022) empirically investigate the determinants and value of the awareness of climate risks and opportunities in the insurance industry, while Brogi et al. (2022) analyze determinants of ESG awareness for insurance companies located in the United States by using unweighted scores based on MSCI ESG KLD STATS. Furthermore,

¹CSR and ESG are often used in the same sense. While CSR is rather more common in the context of the sustainability management of companies, the expression ESG, is used more in the context of measuring sustainability and is often connected with a kind of ESG index (see Capelle-Blancard & Petit, 2017). However, CSR and ESG take a holistic view and consider the three pillars (environmental, social, and governance).

Orazalin et al. (2023) examine the contribution of CSR to the financial stability in the financial sector in general and the insurance industry in particular. Outside the insurance industry, there is already a significant amount of literature that focuses on the relationship between CSR management and corporate financial performance (CFP) for specific countries or industry sectors. While general studies, for example, Friede et al. (2015), Gillan et al. (2021), and Malik (2015) identify the positive impact of CSR management on CFP, empirical literature from an investors' perspective (socially responsible investing) finds no clear results (see, e.g., Gerard, 2019; Halbritter & Dorfleitner, 2015; Revelli & Viviani, 2015). The individual pillars of ESG in other industries have also been examined in the literature but did not indicate any clear results (see Baldini et al., 2018; Crespi & Migliavacca, 2020; Qureshi et al., 2020). However, it is difficult to generalize results from other sectors and apply them to the insurance industry, due to the specifics of insurance companies. For instance, insurance products are intangible products based on trust. Moreover, life insurance typically has long contract durations and there are strong regulatory requirements on corporate governance in general. In addition, behavioral economics needs to be reflected differently in the insurance industry than it is in other industries (see Richter et al., 2019). Previous industry studies also show that customers associate insurance products and insurance companies less with sustainability than other industries (see Simon-Kucher & Partners, 2021). Hence, the goal of this paper is to study the characteristics of insurance companies that implement proper CSR management and to investigate the effects of CSR management on the firm value of insurance companies, which to the best of our knowledge has not been carried out to date.

For this purpose, we obtain data from the LSEG Workspace (former REFINITIV EIKON database) and consider 79 insurance companies from the United States, Europe, China, and Japan over an 11-year period (from 2010 to 2020). We consider various potential determinants (e.g., firm size, profitability), measure the quality of CSR management by means of an ESG score² of LSEG and the firm value by means of Tobin's Q. Based on this, we apply linear fixed effects regression models to our panel data set. Our results reveal that larger firms were in the past significantly further ahead in CSR management, while in the last years differences regarding CSR management depending on the firm size are diminishing. However, in the recent past we find an indication of the value-relevance of corporate social responsibility management in the insurance industry. In this context, a holistic approach regarding CSR management is necessary, that is, taking into account all three pillars E, S, and G. Hence, our findings imply that it is also economically rational for insurance companies to become more sustainable. This may also mean that the market is moving towards a more sustainable direction on its own, and further regulatory interventions may not be necessary.

The remainder of the paper is structured as follows. Section 2 focuses on hypotheses' development. Section 3 describes our data and methodology, while Section 4 presents the results as well as the discussion and points out limitations. Finally, Section 5 concludes.

2 | HYPOTHESES' DEVELOPMENT

The ability and motivation of insurance companies to deal with CSR management might depend on certain influencing factors. For instance, larger insurance companies attract more public attention, provide more information to the capital markets (see Goins & Gruca, 2008)

²ESG scores measure a company's ESG attitude in a retrospective view, in contrast to ESG ratings that adopt a forward-looking approach in terms of risk exposure (see La Torre et al., 2020).

and the issue of sustainability is increasing in importance in the public perception (see, e.g., UNDP, University of Oxford, 2021). Hence, there may be an urgency for larger insurance companies to implement suitable CSR management and to aim to be more sustainable (see, e.g., Chih et al., 2010; Fombrun & Shanley, 1990; Gatzert & Reichel, 2022). Moreover, previous literature (see Gatzert & Martin, 2015; Gatzert & Reichel, 2022) shows that, due to the amount and complexity of risks, larger insurance companies have a more acute awareness of (sustainability) risks, potentially indicating a greater motivation to improve their own CSR management. In line with that, Brogi et al. (2022) find a significant relation between the firm size and the ESG score. Furthermore, Kraus (2024) also finds a size effect for financial institutions reporting on climate-related risks. Finally, larger firms may also be better positioned to implement better CSR management, due to a greater financial leeway and employee capacities (see Gatzert & Reichel, 2022; Menz, 2010; Weinhofer & Hoffmann, 2010). Based on these considerations, we state our first null hypothesis as follows:

Null hypothesis 1 (H1)

There is no significant relationship between size and the CSR management of insurance companies.

Rejecting this hypothesis means that there is a significant relationship between a company's size and its CSR management.

On the one hand, it might be that financially stronger firms are better able to build up proper CSR management. On the other hand, due to pressure from investors, firms with a higher financial leverage might be more driven to implement suitable CSR management (see Gatzert & Reichel, 2022). Investigating Australia's top 200 listed firms, Yunus et al. (2016) find a significant association between carbon strategy adoption and the financial leverage of a firm. Considering CSR management in general, and taking into account the previous considerations, there might be a relationship between CSR management and the financial leverage of a firm. Hence, we state our second hypothesis as follows:

Null hypothesis 2 (H2)

There is no significant relationship between financial leverage and the CSR management of insurance companies.

Rejecting this hypothesis means that there is a significant relationship between a company's financial leverage and its CSR management.

Furthermore, having a certain financial slack for unforeseen, necessary investments might indicate that firms present sustainable, forward-looking behavior and are able to use their considerable financial slack to reduce the financial burden of sustainability risks (see Gatzert & Reichel, 2022). Hence, it might be that ability and motivation to conduct appropriate CSR management is greater for firms with significant slack. On the other hand, insurance companies might reduce their financial slack temporarily to be able to invest in their sustainable development. This leads to our third hypothesis as follows:

Null hypothesis 3 (H3)

There is no significant relationship between slack and the CSR management of insurance companies.

Rejecting this hypothesis means that there is a significant relationship between a company's slack and its CSR management.

Setting up suitable CSR management can initially lead to high costs, which is why more profitable insurance companies might be better equipped to invest in CSR management. This would indicate that the higher profitability of a firm might lead to better CSR management. However, it might also be the case that due to better CSR management, insurance companies gain competitive advantages and increase their profitability. Analyzing a world-wide data sample of 727 financial firms, Crespi and Migliavacca (2020) verify a positive relationship between a company's profitability and its corporate social performance. Similarly, measuring profitability by means of return on assets Brogi et al. (2022) also find a positive relationship in the insurance industry. In contrast to this, due to significant implementation costs (e.g., for product development or process redesigning) it may also be that insurance companies which implement suitable CSR management have lower profitability temporarily. Overall, this leads to our fourth hypothesis as follows:

Null hypothesis 4 (H4)

There is no significant relationship between profitability and the CSR management of insurance companies.

Rejecting this hypothesis means that there is a significant relationship between a company's profitability and its CSR management.

The value of an enterprise (measured by Tobin's Q) reflects the investors' expectations for the future (see Hoyt & Liebenberg, 2011). Since CSR management has a long-term perspective and contains, among others, corporate governance aspects and dealing with sustainability risks, there might be a positive relationship between the enterprise value and CSR management. Considering the awareness of climate risks and opportunities, which can be seen as a preliminary stage of CSR management, Gatzert and Reichel (2022) find a statistically significant positive value effect on Tobin's Q in the United States and European insurance industries. Moreover, customers might attribute more value to sustainable products from a sustainable insurance company, which could lead to a greater demand or higher premium income. In addition, dealing with sustainability, in general, can also be seen as an indicator of responsible management that generates trust. Since trust is a central element of the insurance industry, this might result in competitive advantage, increasing enterprise value. Similarly, social aspects, such as training for employees or gender equality, may attract a higher percentage of good employees. In contrast to this, it could be argued that CSR management might be costly and therefore could decrease the enterprise value. Focusing on other industries, previous studies exist which deal with the relationship between CSR management and enterprise value with partially different results (see, e.g., Behl et al., 2021; Bing & Li, 2019; Malik, 2015). Altogether, this leads to our fifth hypothesis as follows:

Null hypothesis 5 (H5)

There is no significant relationship between CSR management and the enterprise value of insurance companies.

Rejecting this hypothesis means that there is a significant relationship between a company's CSR management and its enterprise value.

3 | DATA AND RESEARCH METHODOLOGY

To test our hypotheses, we use data from the LSEG database, which is widely used in academic, economic literature (see, e.g., Gatzert & Reichel, 2022; Heidinger & Gatzert, 2018; Hübel et al., 2019).

We focus on the most significant insurance markets of the United States, China, Japan, and Europe (see GDV, 2021b) and consider insurance companies³ from 2010 to 2020. Therefore, we start with all insurers headquartered in these regions, with an available market capitalization for 2020 in LSEG, and then apply several screening criteria. Besides firms whose main business is not associated with insurance (e.g., conglomerates or insurance brokers), we exclude all companies with total assets below 10,000,000 € to reduce the effects of distortion. Finally, we remove incomplete datasets, leaving 78 insurance companies in our data sample (see Table 1), corresponding to approximately three-quarters of the market capitalization of the initial sample. Overall, our data sample contains 692 firm years in the analysis relating to the determinants of CSR management and 691 firm years in the evaluation of value creation, due to CSR management. In addition to analyzing the entire period, we consider the periods from 2010 to 2017 and the recent past⁴ 2018–2020 separately to investigate specific trends for each hypothesis.

Based on the Hausmann specification test, we apply a linear fixed effects regression model for the analysis regarding the determinants of CSR management. After running the modified Wald test to check for group wise heteroskedasticity, we use the robust linear fixed effects regression model. Using a correlation matrix as a check, we did not find evidence for endogeneity and multicollinearity.

Following previous literature, we use the ESG score as an indicator for CSR management (see, e.g., Cheng et al., 2014; Clément et al., 2023; Orazalin et al., 2023), as it can be assumed that the result of CSR management is reflected in the ESG score. To measure the quality of a firm's CSR management, we use the *ESG Score* (*ESG*) from LSEG as our dependent variable. The score is composed of three pillar scores: the environmental pillar score with the categories, resource use, emissions, and innovation; the social pillar score with the categories, workforce, human rights, community, and product responsibility and the governance pillar score with the categories, management, shareholders and CSR strategy. These are calculated by 186 company-level ESG measures in total. Moreover, LSEG uses sector-specific weightings (see LSEG, 2023).

Based on our hypotheses from Section 2, we use *Size* (*H1*), *Leverage* (*H2*), *Slack* (*H3*) and *Return on Equity* (*ROE*) (*H4*) as independent variables. Similar to other studies in this context (e.g., Gatzert & Reichel, 2022), we measure *Size* by using the natural logarithm of the total assets (book value) and calculate *Leverage* by dividing a firm's book value of liabilities by its market value of equity. *Slack* is defined as the ratio of cash, as well as short-term investments and the book value of total assets. *ROE* is calculated as the ratio of the net income and the average of last year's and the current year's common equity. We furthermore include dummy variables, *Year*, to account for time effects and additionally consider firm fixed effects, α . Altogether, this leads to the following model:

$$ESG_{it} = \alpha_i + \beta_1 Size_{it} + \beta_2 Leverage_{it} + \beta_3 Slack_{it} + \beta_4 ROE_{it} + \beta_{5-14} Year_i + u_{it}. \quad (1)$$

³We do not distinguish between life- and nonlife-insurance companies. CSR strategies are typically implemented on insurance group level and most insurance companies in our sample are active in life- and nonlife insurance. Nevertheless, according to Gatzert and Reichel (2022) life insurance companies usually face more pronounced transition and physical risks due to their long-term perspective.

⁴In line with Bing and Li (2019) we decided to analyze the last 3 years of our panel data set to identify specific trends in the recent past. Furthermore, Borovkova and Wu (2020) show that the number of companies with an ESG Score in 2018 is substantially higher than the years before, leading to more data for the regression model. This also true for our data set.

TABLE 1 Sampling procedure.

Screening criteria	Number of firms
Total insurers with available market capitalization in LSEG, headquartered in the United States, China, Japan, and Europe	288
After exclusion of all firms whose main business does not provide insurance	174
After exclusion of all firms with total assets below 10,000,000 €	79
After exclusion of firms without complete data for the sample period	78

To empirically study the value of CSR management, we also use a linear fixed effects model, after applying the Hausman specification test to our panel data set. After running the modified Wald test to check for group wise heteroskedasticity, we again use the robust linear fixed effects regression model. Using a correlation matrix as a check, we did not find evidence for endogeneity and multicollinearity. The enterprise value, measured by *Tobin's Q* (Q) is calculated in line with, for example, Hoyt and Liebenberg (2011), by dividing the sum of the market value of equity and the book value of liabilities by the book value of total assets. Besides considering *ESG (H5)* as the major independent variable, we include *Size*, *Leverage*, *Return on Assets (ROA)*, *Dividends* and *SalesGrowth* as control variables (see, e.g., Bohnert et al., 2017; Bohnert et al., 2019; Hoyt & Liebenberg, 2011). *Dividends* represents a dummy variable that takes the value 1, if dividends have been paid in year t and 0 otherwise, while *SalesGrowth* is the difference between sales or revenue in year t and in year $t - 1$, divided by net sales or revenue in $t - 1$ (for variable definitions, see also Bohnert et al., 2019). We again include dummy variables, *Year*, to account for time effects. Overall, this leads to the following model:

$$Q_{it} = \alpha_i + \beta_1 ESG_{it} + \beta_2 Size_{it} + \beta_3 Leverage_{it} + \beta_4 ROA_{it} + \beta_5 Dividends_{it} + \beta_6 SalesGrowth_{it} + \beta_{7-16} Year_t + u_{it}. \quad (2)$$

To examine the results of this regression, we ran two robustness checks. As in our first model, we substitute *ESG* with *ESGC*, this time as an independent variable. Moreover, in line with previous literature (see, e.g., Gatzert & Reichel, 2022; Heidinger & Gatzert, 2018; Hoyt & Liebenberg, 2011) we check for robustness by excluding *Dividends* and *SalesGrowth* from the model.

4 | RESULTS, DISCUSSION, AND LIMITATIONS

The empirical results regarding the determinants of CSR management are presented in Table 2. Our results show that *Size* is statistically significant, which is in line with previous literature (see, e.g., Brogi et al., 2022; Chih et al., 2010; Gatzert & Reichel, 2022). While the other independent variables are not statistically significant. Besides the entire period, we analyze the nearer past (2018–2020) and the remaining years (2010–2017) separately. Regarding *Size* the analyses of 2018–2020 shows that firm size is no longer the driving force, as there is no statistical significance in the analyses of 2018–2020. A potential explanation might be that CSR

TABLE 2 Empirical results for the robust linear fixed effects model with *ESG* as the dependent variable.

Variable	Coefficient 2010–2020	Coefficient 2010–2017	Coefficient 2018–2020
R^2 (within)	0.395	0.222	0.208
Size (<i>H1</i>)	6.164**	7.621***	5.141
Leverage (<i>H2</i>)	2.099×10^{-4}	$-0.3.189 \times 10^{-4}$ *	−0.036
Slack (<i>H3</i>)	−28.080	3.557	−79.133*
ROE (<i>H4</i>)	−0.029	−0.566	0.021

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 3 Empirical results for the robust linear fixed effects model with *E* as the dependent variable.

Variable	Coefficient 2010–2020	Coefficient 2010–2017	Coefficient 2018–2020
R^2 (within)	0.114	0.157	0.177
Size	9.103*	7.955	12.581*
Leverage	5.646×10^{-4}	9.060×10^{-5}	-5.720×10^{-3}
Slack	−44.225	−9.645	4.698
ROE	0.081	0.012	−0.034

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

management was initially in the focus of large companies, while in the recent past the relevance of the topic has reached companies of all sizes. However, despite the fact that we excluded small companies from our data sample, and insurance companies are typically larger companies that have extensive disclosure requirements, there could still be a bias due to company size. Larger firms tend to provide more data, which leads to better data availability in the ESG database, potentially resulting in a better ESG score (see Drempetic et al., 2020).

While *Leverage* (negative relationship) is also statistically significant in the 2010–2017 analysis, only *Slack* (negative relationship) is statistically significant in 2018–2020. Potentially, with “sustainability” becoming more prominent in the minds of insurance companies, they aimed to drive their sustainable development leading to higher initial costs and reducing slack. Since we were unable to find statistical significance for *ROE*, this could indicate that the offsetting effects described in Section 2 cancel each other out. Causality cannot be proven on the basis of statistical analyses. We therefore proceed as in comparable articles that deal with influencing factors and interpret the statistical findings accordingly. In combination with theoretical considerations, however, it makes sense to speak of size as a determinant, for example, and is also in line with previous literature (see, e.g., Heidinger & Gatzert, 2018). Overall, concerning the determinants of CSR management, we can reject Null Hypotheses *H1* regarding *Size*.

Furthermore, we analyze in more detail the determinants on the three pillar scores that build the ESG score. The influence on the *environmental pillar score* (*E*), when we substitute *ESG* from (1) with *E*, is described in Table 3. In this case, *Size* is again statistically significant, while the other independent variables are not statistically significant. In the time period

2018–2020 *Size* is statistically significant with a positive relationship, while there is no statistical significance in 2010–2017.

In Table 4 we present the results of the influence on the *social pillar score* (*S*), as we substitute *ESG* from (1) with *S*. For this pillar score, *Size* and *Leverage* are statistically significant, both having a positive relationship. *Slack* and *ROE* are not statistically significant. Investigating 2010–2017 again *Size* and *Leverage* are statistically significant with a positive relationship, while there is no statistical significance in 2018–2020.

The empirical results regarding the influence on the *governance pillar score* (*G*), as we substitute *ESG* from (1) with *G* are presented in Table 5. These show a statistical significance of *Size*, *Leverage* and *ROE*, with *Size* having a positive relationship, while *Leverage* and *ROE* are negatively related to this pillar score. *Slack* is not statistically significant. Nevertheless, focusing on the time period 2010–2017 *Leverage* and *ROE* are statistically significant, both having a negative relationship. In contrast to this, in the period 2018–2020 *Size* and *Slack* are statistically significant, with *Size* being positively and *Slack* negatively related to the pillar score.

Apart from *Size*, which is statistically significant for the entire sample for all pillar scores, the other determinants do not show a consistent pattern with respect to the three areas of CSR management.

The empirical results regarding the value effect of CSR management are presented in Table 6. Using the linear robust fixed effects model, we find no statistically significant effect of *ESG* on *Q*. Our results are robust, as we do not find substantial changes in relationships or significance levels, when we exclude *Dividends* and *SalesGrowth* from the model. This in contrast to the major prevailing meta studies in other industries, which confirm a positive relationship between *ESG* and *CFP* (e.g., Friede et al., 2015; Whelan et al., 2021). In addition to

TABLE 4 Empirical results for the robust linear fixed effects model with *S* as the dependent variable.

Variable	Coefficient 2010–2020	Coefficient 2010–2017	Coefficient 2018–2020
<i>R</i> ² (within)	0.358	0.264	0.092
<i>Size</i>	5.971*	8.076**	−9.259
<i>Leverage</i>	$2.166 \times 10^{-3***}$	$1.251 \times 10^{-3***}$	0.048
<i>Slack</i>	−48.991	−50.815	−30.139
<i>ROE</i>	0.082	0.020	0.022

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 5 Empirical results for the robust linear fixed effects model with *G* as the dependent variable.

Variable	Coefficient 2010–2020	Coefficient 2010–2017	Coefficient 2018–2020
<i>R</i> ² (within)	0.146	0.056	0.155
<i>Size</i>	5.325*	7.190	19.463**
<i>Leverage</i>	$-2.157 \times 10^{-3***}$	$-2.257 \times 10^{-3***}$	−0.145
<i>Slack</i>	−7.116	58.496	−164.055*
<i>ROE</i>	−0.186***	−0.156**	0.039

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 6 Empirical results for the robust linear fixed effects model with Q as the dependent variable.

Variable	Coefficient 2010–2020	Coefficient 2010–2017	Coefficient 2018–2020
R^2 (within)	0.268	0.264	0.326
<i>ESG (H5)</i>	2.698×10^{-4}	4.138×10^{-4}	$8.212 \times 10^{-4*}$
<i>Size</i>	-0.069^{**}	-0.067	-0.181
<i>Leverage</i>	$5.040 \times 10^{-5***}$	$4.430 \times 10^{-5***}$	-4.429×10^{-4}
<i>ROA</i>	0.011^{**}	7.722×10^{-3}	0.013^{**}
<i>Dividends</i>	0.010	0.014	-6.607×10^{-3}
<i>SalesGrowth</i>	$-2.410 \times 10^{-4***}$	$-2.076 \times 10^{-4***}$	3.830×10^{-5}

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 7 Empirical results for the robust linear fixed effects model with Q as the dependent variable and E as the independent variable.

Variable	Coefficient 2010–2020	Coefficient 2010–2017	Coefficient 2018–2020
R^2 (within)	0.270	0.263	0.325
E	2.506×10^{-4}	2.481×10^{-4}	4.227×10^{-4}
<i>Size</i>	-0.070^{**}	-0.066	-0.182
<i>Leverage</i>	$5.030 \times 10^{-5***}$	$4.430 \times 10^{-5***}$	-4.686×10^{-4}
<i>ROA</i>	0.011^{**}	7.670×10^{-3}	0.013^{**}
<i>Dividends</i>	9.356×10^{-3}	0.012	-3.742×10^{-3}
<i>SalesGrowth</i>	$-2.476 \times 10^{-4***}$	$-2.177 \times 10^{-4***}$	2.110×10^{-5}

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

considering the entire period, we again analyze the nearer past (2018–2020) and the remaining years (2010–2017) separately. For the latter we find no statistically significant effect of *ESG* on Q . On the other hand, we find a statistically significant positive effect of *ESG* on Q regarding the nearer past, indicating a value-relevance of CSR management. It might be that in earlier years the issue of sustainability was not as much in the focus of the stakeholders of insurance companies. However, this has changed significantly in the recent past and insurance companies are able to benefit from a sustainable behavior. By that we can extend the positive relationship of being aware of climate risks and a firm's value, highlighted by Gatzert and Reichel (2022), as well as the positive relation between CSR and the financial stability, pointed out by Orazalin et al. (2023), to a positive relationship between CSR management and enterprise value. Thus, we can reject Null Hypothesis $H5$.

In addition to this we analyze the value effect of the pillar scores. We substitute *ESG* from (2) with E , S , and G , each in a separate regression, to determine the different influence of the pillar scores on the enterprise value. In Table 7, the results are shown for E instead of *ESG* as the former is the independent variable. In this case, we do not observe a significant impact of E on Q with the results being robust when excluding *Dividends* and *SalesGrowth* from the model,

as done previously. Related to the time period of 2010–2017 as well as 2018–2020 we do not find any changes in significance for E , with the results being robust.

Moreover, with S being the substitute for ESG as the independent variable, the results are represented in Table 8. Once again, we find no statistically significant effect of S on Q . When excluding *Dividends* and *SalesGrowth* from the model, the results are similar. Related to the time period of 2010–2017 as well as 2018–2020 we do not find any changes in significance for S , with the results being robust.

Finally, the results for G instead of ESG as the independent variable are shown in Table 9. We also did not find a significant impact of G on Q , which is the same with reduced control variables. Related to the time period of 2010–2017 as well as 2018–2020 we do not find any changes in significance for G . However, with reduced control variables there is a significant impact of G on Q , with a positive relationship, regarding the period of 2010–2017.

The results of the robustness checks can be found in the appendix (see Tables A1–A4).

Even though the effect of the ESG score on the enterprise value is significant, the effect of each single pillar score on the enterprise value is not. An explanation for this might be that it depends on the interaction of all three pillar scores (holistic CSR management), while a single

TABLE 8 Empirical results for the robust linear fixed effects model with Q as the dependent variable and S as the independent variable.

Variable	Coefficient 2010-2020	Coefficient 2010-2017	Coefficient 2018-2020
R^2 (within)	0.267	0.261	0.317
S	-6.16×10^{-5}	-9.680×10^{-5}	1.723×10^{-4}
<i>Size</i>	-0.067^{**}	-0.064	-0.175
<i>Leverage</i>	$5.060 \times 10^{-5***}$	$4.440 \times 10^{-5***}$	-4.785×10^{-4}
<i>ROA</i>	0.011^{**}	7.616×10^{-3}	0.013^{**}
<i>Dividends</i>	0.011	0.018	-3.854×10^{-3}
<i>SalesGrowth</i>	$-2.481 \times 10^{-4***}$	$-2.190 \times 10^{-4***}$	2.86×10^{-5}

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

TABLE 9 Empirical results for the robust linear fixed effects model with Q as the dependent variable and G as the independent variable.

Variable	Coefficient 2010-2020	Coefficient 2010-2017	Coefficient 2018-2020
R^2 (within)	0.269	0.267	0.324
G	2.116×10^{-4}	2.346×10^{-4}	4.156×10^{-4}
<i>Size</i>	-0.069^{**}	-0.066	-0.185
<i>Leverage</i>	$5.100 \times 10^{-5***}$	$4.500 \times 10^{-5***}$	-4.085×10^{-4}
<i>ROA</i>	0.012^{**}	$7.882 \times 10^{-3*}$	0.013^{**}
<i>Dividends</i>	0.011	0.016	-6.080×10^{-3}
<i>SalesGrowth</i>	$-2.389 \times 10^{-4***}$	$-2.027 \times 10^{-4***}$	3.020×10^{-5}

Note: ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

view on one pillar score may not lead to the expected impact in terms of generating corporate value. Only by behaving convincingly sustainable in all three categories (E, S, and G) allows insurance companies to be perceived as sustainable and allows them to add value.

Hence, our results indicate that, in the first years of the last decade, customers did not reward the efforts of insurance companies in terms of sustainability in the way they do in other industries. This could be due to the fact that customers pay less attention to sustainability when buying insurance products compared with buying, for example, food or cars, since they associate the insurance industry less with sustainability than other industries (see Simon-Kucher & Partners, 2021). However, it seems to be that the situation changed in the last years. The topic of sustainability gets more attention from stakeholders in last years, and we find a significant positive impact of CSR management on the enterprise value. Fostering sustainability activities leads to higher costs for the insurance companies, which are, however, overcompensated, for example, by higher earnings. Therefore, it is not only an altruistic approach for the insurance companies to foster CSR management, but an advantage from the economic point of view, which is why strong regulation in this area may no longer be necessary, as the market is able to regulate this by itself. To ensure the economic added value of CSR management, insurance companies and the insurance industry as a whole should therefore aim to make their customers aware of their contribution to sustainable development, to focus customers' attention regarding this topic, similar to the issue of flood insurance and flood risk knowledge (see Kousky & Netusil, 2023). However, it is also important that not only green insurance policies are offered, but that the entire insurance company acts sustainably, to be credible and to avoid reputational risks (e.g., greenwashing).

However, regulation should not be overlooked when considering the results. Regulation, particularly in Europe, is a potential driver for corporate ESG activities. Increasing regulation is forcing companies to address and report on ESG issues. In addition, there is a change in the public perception of these issues, even if this applies more to other industries than to the insurance industry (see Simon-Kucher & Partners, 2021).

A potential limitation of our results is that, e.g., Gregory (2021) criticizes using Tobin's Q in context with CFP and ESG. The latter shows that E, S, and G are affecting productivity and debt costs, which is why the effect of E, S, and G on CFP, as measured by regression, might be biased. However, due to the wide distribution, compared to other studies and the lack of adequate alternatives, we still use Tobin's Q as the indicator of an enterprise's value. Moreover, our study only analyses relationships between variables but does not investigate causality. A further limitation might be the composition of the ESG score, as the basic structure is the same for all industries, even if the weightings of the individual pillars per industry differ (see LSEG, 2023). Finally, since LSEG provides ongoing rewriting on the ESG score (see Berg et al., 2021) and Berg et al. (2022) identify a divergence in ESG ratings, further research should focus on the robustness of our results with other ESG ratings.

5 | CONCLUSION

The aim of this paper was to empirically study CSR management in the insurance industry. For this purpose, we analyzed the determinants of CSR management and the impact of this on the value of an enterprise. For the purposes of our analyses, we used the data of insurance companies from the United States, China, Japan, and Europe, provided by LSEG, over a period of 11 years (2010–2020). To analyze the determinants and the value of CSR management, we used a robust linear fixed effects regression model.

Our findings in this paper reveal a significantly positive relationship between larger insurers and their CSR management for the entire time period from 2010 to 2020, potentially due to customers and investors putting greater pressure on larger firms to act more sustainably. However, studying smaller time periods we find a shift in the determinants. In the recent past (since 2018) insurance companies of all sizes seem to foster their sustainable development and make investments to become more sustainable.

Our results regarding the value of corporate social responsibility management show that over the entire period there is no significant relationship between the ESG score and an enterprise's value, with the respective pillar scores, considered individually, also not having a significant effect. However, the topic "sustainability" has received considerably more attention in public, especially in recent years, which is also clearly reflected in our results. In the period from 2018 to 2020, we find an indication of the value-relevance of a holistic corporate social responsibility management, since our results reveal a significant positive relationship between the ESG score and the enterprise value. Hence, it seems that stakeholders have been paying more attention to sustainability in recent years and that it therefore makes economic sense for insurance companies to address this issue. Based on this, our results indicate that the insurance market might be able to move towards a more sustainable direction on its own, reducing the importance of further regulatory interventions in this regard.

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APPENDIX

Robustness Checks

Value-relevance of corporate social responsibility management (A1-A4)

TABLE A1 Empirical results for the robust linear fixed effects model with Q as the dependent variable, ESG as the independent variable and reduced control variables.

Variable	Coefficient 2010-2020	Coefficient 2010-2017	Coefficient 2018-2020
R^2 (within)	0.246	0.240	0.324
ESG	4.123×10^{-4}	6.144×10^{-4}	$7.571 \times 10^{-4*}$
$Size$	-0.069^{**}	-0.066	-0.181
$Leverage$	$4.550 \times 10^{-5***}$	$3.850 \times 10^{-5***}$	-4.179×10^{-4}
ROA	$9.620 \times 10^{-3*}$	5.418×10^{-3}	0.013^{**}

Notes: ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

TABLE A2 Empirical results for the robust linear fixed effects model with Q as the dependent variable, E as the independent variable and reduced control variables.

Variable	Coefficient 2010-2020	Coefficient 2010-2017	Coefficient 2018-2020
R^2 (within)	0.2462	0.236	0.3243
E	2.582×10^{-4}	2.827×10^{-4}	4.214×10^{-4}
$Size$	-0.069^{**}	-0.064	-0.182
$Leverage$	$4.520 \times 10^{-5***}$	$3.810 \times 10^{-5***}$	-4.529×10^{-4}
ROA	$9.353 \times 10^{-3*}$	5.145×10^{-3}	0.013^{**}

Notes: ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

TABLE A3 Empirical results for the robust linear fixed effects model with Q as the dependent variable, S as the independent variable and reduced control variables.

Variable	Coefficient 2010-2020	Coefficient 2010-2017	Coefficient 2018-2020
R^2 (within)	0.243	0.233	0.317
S	2.400×10^{-5}	3.660×10^{-5}	1.504×10^{-4}
$Size$	-0.067^{**}	-0.062	-0.175
$Leverage$	$4.520 \times 10^{-5***}$	$3.800 \times 10^{-5***}$	-4.593×10^{-4}
ROA	$9.286 \times 10^{-3*}$	5.062×10^{-3}	0.013^{**}

Notes: ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.

TABLE A4 Empirical results for the robust linear fixed effects model with Q as the dependent variable, G as the independent variable and reduced control variables.

Variable	Coefficient 2010-2020	Coefficient 2010-2017	Coefficient 2018-2020
R^2 (within)	0.247	0.243	0.323
G	3.013×10^{-4}	$4.524 \times 10^{-4*}$	3.864×10^{-4}
$Size$	-0.068^{**}	-0.065	-0.184
$Leverage$	$4.640 \times 10^{-5***}$	$3.950 \times 10^{-5***}$	-3.891×10^{-4}
ROA	$9.854 \times 10^{-3*}$	5.648×10^{-3}	0.013^{**}

Notes: ***, ** and * denote statistical significance at the 1%, 5% and 10% levels, respectively.