Over-investment in the Environmental, Social, and Governance Pillar: Is there a Cost of Being too Sustainable?

Florian Habermann

Catholic University Eichstätt-Ingolstadt

Abstract

This paper builds on the current corporate social performance (CSP) research and contributes to the literature by deriving a CSP over-investment hypothesis. I determine the over-investment threshold as the mean year-industry environmental, social, governance (ESG) performance. Asset4 ESG ratings serve as an indicator for ESG performance, i.e. CSP. The final sample includes more than 4.500 firm-year observations for firms listed in the S&P500 from 2005 to 2019. I find an overall positive effect of CSP on CFP. However, the results of my panel data regressions with industry-fixed effects further show a value-destroying effect of CSP over-investment on market capitalization. Additionally, the results of several robustness tests strengthen my findings. Therefore, the conclusion is twofold. First, CSP is not solely 'greenwashing' but rather value-enhancing up to an industry-specific threshold. Second, however, a CSP above the average industry CSP lowers firm value. Accordingly, although my results imply that CSP over-investment leads to lower CFP, they do not necessarily imply that CSP over-investment is value-destroying in all industries or regions. Further research must focus on examining the effect separately in different industries and regions.

Keywords: Corporate Social Performance (CSP); Environmental, Social, and Governance (ESG) Performance; Over-investment in Sustainability; Corporate Financial Performance (CFP); Firm Value

1 Introduction

In 2020, the infamous article “The Social Responsibility of a Firm Is to Increase Profits” by *Milton Friedman* (1970) celebrated its fiftieth anniversary. Since this article has been published, the assessment of corporate social responsibility (CSR) has changed (Zingales, 2020). Between 2007 and 2012, in the U.S., only 13.5% of CSR proposals received investors support at shareholder meetings (Flammer, 2015). Nowadays, institutional investors, such as *BlackRock*, publicly accuse supervisory boards of failing to address ESG issues sufficiently (Köhler & Landgraf, 2020) and attest firms an inadequate risk assessment around environmental, social, and governance (ESG) issues (Mooney et al., 2020). In line with this, governments are also committing themselves and their economies to the UN Sustainable Development Goals. For instance, the European Parliament adopts the EU green deal to boost the efficient use of resources by moving to a clean, circular economy (EU, 2020a). In addition, the Regulation EU 2020/852 facilitates sustainable investments (EU, 2020b). By this regulation, the EU aims to provide business and investors with a uniform sustainability indicator for business activities but also to enable sustainable firms to prosper. The previous examples demonstrate growing importance of CSR in society and business practice.

As a result, a large amount of empirical studies exists that examines the relationship between corporate social performance (CSP) and corporate financial performance (CFP). *Friede* et al. (2015) identified over 2,200 published studies between 1970 and 2015. *Margolis* et al. (2009) examine 251 studies on the topic, and they provide evidence that firms with higher CSP also achieve higher CFP. Moreover, they derive that the effect depends on the applied financial performance measure, data, and research methodology. However, due to several conceptual and methodological problems in prior studies on the CSP-CFP relationship, recent studies have questioned this positive effect. Current research tends to show that doing good will not necessarily lead to doing financially well (Orlitzky, 2015; Zhao & Murrell, 2016). Additionally, the evaluation of CSP is observer-dependent and according to *Orlitzky* (2015), the judgment of CSP even includes an ideological character. Therefore, high CSP could be judged as over-investment by investors, analysts, or managers based on their perception, which justifies the examination of over-investment in CSP.

In this respect, my study contributes to the academic debate on the value-relevance of sustainable endeavors in capital market-oriented firms (Margolis et al., 2009; Deng et al., 2013; Servaes & Tamayo, 2013; Dorfleitner et al., 2015; Malik, 2015, Albuquerque et al., 2019). My study intends to broaden the understanding of the relation between CSP and the value relevance in the three ESG pillars. Moreover, this paper contributes to the existing literature by trying to identify an over-investment effect of ESG endeavors (Fernando et al., 2017; Utz, 2018) on firm value. To the best of my knowledge, no previous research addressed the effect of over-investment, as conducted in my analyses. Based on year-industry specific thresholds, I try to identify a value-destroying effect of CSP over-investment. The results of fixed effects regressions provide significant evidence that such an effect exists. More precisely, ESG performance (measured by *Asset4* ESG pillar scores) above the average year-industry pillar performance is lowering firm value. For this reason, novelty insights are provided and open or at least revive the discussion on CSP over-investment. Nonetheless, although selected robustness tests support my findings, further research must be executed to confirm my findings and provide more in-depth insights toward industry-specific over-investment thresholds.

The remainder of this paper is structured as follows. Section 2 provides a literature review on how CSP can affect CFP. Section 3 develops the research hypotheses. In section 4, I present the data and introduce the applied research methodology. Section 5 depicts the results of the empirical analyses. In Section 6, several robustness tests are conducted. Finally, Section 7 concludes the paper.

2 Literature Review

Finance and accounting literature provide evidence, as introduced in Section 1, that CSP can enhance but also lower firm value. Stakeholder theory (Freeman, 1984) occupies a central role in the CSP-CFP relationship. As a result, a firm should not exclusively focus on its shareholders' interests but also on its various stakeholders (Margolis et al., 2009; Dorfleitner et al., 2015; Flammer, 2015; Garcia et al., 2017). Equity analysts evaluate firms' stakeholder relationships for their investment decisions and address them as an essential success factor (Fieseler, 2011). However, these mostly conflicting interests of shareholders and stakeholders result in a tradeoff for firms. Regarding firm value, which is directly related to firm performance (Aouadi & Marsat, 2018), managers should invest in sustainability endeavors as long as the benefits exceed the costs. For shareholders, additional costs above this threshold imply a waste of resources and lower shareholder value, and therefore CSP over-investment (Garcia et al., 2017; Aouadi & Marsat, 2018; Baboukardos, 2018).

I identify three main costs of being sustainable: (i) spendings on sustainability projects (Servaes & Tamayo, 2013; Vishwanathan et al., 2020); (ii) the promotion of CSP, even nowadays, to a certain extent legally required (Utz, 2018); (iii) opportunity costs of projects that do not comply with ESG standards of a firm and, therefore, cannot be executed (Kaspereit & Lopatta, 2016; Utz, 2018).

However, several potential benefits stand vis-à-vis the mentioned costs. I cluster them as follows: (i) financial market advantages; (ii) competitive organizational advantages. Improved reputation is an organizational advantage (Linthicum et al., 2010; Malik, 2015). As a result, sustainable business practices increase customer trust and loyalty (Cheng et al., 2014; Garcia et al., 2017). Moreover, following *Brown* et al. (2006), sustainable firms receive better media coverage. For this reason, according to *Kaspereit* and *Lopatta* (2016), they can expect a price premium for their products. As a result, the mentioned benefits result in higher revenues and c.p. in higher earnings. By increasing productivity and employee loyalty, a sustainable firm can also achieve employee-related benefits. Literature mentions improved morale and higher job satisfaction as the main reasons (Valentine & Fleischman, 2008; Malik, 2015; Kaspereit & Lopatta, 2016; Kunz, 2020). In the group of capital market benefits, a lower systematic (measured with *Beta* in CAPM) and idiosyncratic risk (e.g., measured as the stock volatility that is not explained by the *Beta*; Lee & Faff, 2009; Cheng et al., 2014; Garcia et al., 2017) are the advantages. Both reductions lead to higher cash flows and c. p. to higher firm value (Malik, 2015; Garcia et al., 2017; Baboukardos, 2018). For the most part, this is in line with the latest meta-analysis from *Vishwanathan* et al. (2020). The authors show four value-creating mechanisms: (i) enhancing firm reputation; (ii) increasing stakeholder reciprocation; (iii) mitigating firm risk; (iv) strengthening innovation capacity. Table 1 summarizes the previously specified cost and benefits.

Table 1: Cost and benefits of corporate sustainability

Benefits of corporate sustainability	Cost of corporate sustainability
Organizational benefits	Cost of investing in sustainability projects
Improved firm reputation	Cost of promoting sustainability
Improved trust and loyalty of customers	Opportunity costs for not conducted investments
Customers are willing to pay a price premium	due to sustainability constraints
Lower wages and are more productive employees	
Strengthened innovation capacity	
Capital market benefits	
Decreased systematic and idiosyncratic risk	

Lower cost of capital
Increased future cash flows

In sum, I derive that the costs of ESG endeavors and CSP are positively correlated in literature. Consequently, CSP and ESG rating levels show a positive correlation. For instance, if a firm expands its ESG endeavors, the CSP will increase, which results in a higher ESG rating. On the other hand, the CSP-corporate sustainability benefits relation seems to be non-linear. More precisely, up to a certain (unknown) threshold, a higher CSP results in increased organizational or capital market benefits. However, once this threshold is passed an increase in CSP does not lead to additional benefits. Furthermore, based on a vast amount of literature and four substantial meta-analyses (Margolis & Walsh, 2003; Margolis et al., 2009; Friede et al., 2015; Vishwanathan et al., 2020), the effect of CSP on CFP seems to be inconclusive. Since no other studies besides *Fernando* et al. (2017) and *Utz* (2018) can be found that incorporate the over-investment effect of ESG endeavors it is incrementally necessary to examine this issue.

3 Hypotheses Development

During the management process, capital resources have to be efficiently allocated. An optimal investment level exists. Any investment above this threshold increases the probability of investing in projects with negative net present value (Bhuiyan & Hooks, 2019) and consequently results in lower firm value (Titman et al., 2004; Fu, 2010; Ding et al., 2019). ESG endeavors are investment decisions, and management literature indicate that an optimal CSP level exists (McWilliams & Siegel, 2001). Therefore, a transgression of the optimal ESG investment level will reduce firm value (Utz, 2018). Supporting this, *Utz* (2018) provides evidence that CSP over-investment of U.S. firms increases idiosyncratic risk. More precisely, the author shows that investing in CSR activities is not viable if the optimal point is exceeded. As a result, the higher idiosyncratic risk lowers cash flows and c. p. firm value (Malik, 2015; Garcia et al., 2017; Baboukardos, 2018). In line with this, *Garcia* et al. (2017) depict the relation between CSP and systematic risk as an inverted U-shaped curve. Therefore, a value of systematic risk exists that maximizes CSP. The authors show that this maximum is close to one. In other words, firms showing a systematic risk similar to the risk in a benchmark portfolio maximize CSP. I hypothesize that this inverted U-shaped relation holds true for the effect of CSP on CFP, i.e., firm value. Accordingly, the average year-industry ESG rating indicates the hypothesized over-investment threshold.

Further arguments exist that support my over-investment hypothesis. Earlier studies show lower future profits as a result of high CSP, whereas no additional stock risk protection is preserved (Handelmann & Arnold, 2001; Smith, 2003). Lower future profits c.p. decrease firm value. Second, an empirical study discovers the value-destroying effect of over-investment in the environmental pillar (Fernando et al., 2017). The authors argue that investors shy away from stocks over-investing in ESG endeavors. Particularly, institutional investors, such as banks, insurance companies, or financial investment institutions, hold significantly lower shares of firms overinvesting in environmental endeavors (Fernando et al., 2017). Overall, I hypothesize that CSP and CFP follows an inverted U-shaped curve. In all three pillars, investments in CSP above the industry mean are considered as additional and unnecessary costs that outweigh the benefits and destroy firm value (see Appendix 1, Figure 1). Besides that, investors might perceive a CSP above the average industry CSP as not essential, inefficient, and a waste of resources. For these reasons, in the sense of *Flammer* (2015, p. 2550): "as companies keep increasing their social performance, the returns from an additional CSR initiative may decrease", I state the following hypotheses:

Hypothesis 1: Over-investment, either in the environmental, social, or governance pillar, lowers firm value.

Hypothesis 2: Over-investment in the environmental pillar lowers firm value.

Hypothesis 3: Over-investment in the social pillar lowers firm value.

Hypothesis 4: Over-investment in the governance pillar lowers firm value.

4 Data and Research Methodology

4.1 Sample Selection and Description

This study considers more than 7,575 firm-year observations for S&P 500 listed firms from 2005 to 2019. Firm-level data, such as market value or total assets, are downloaded via *Thomson Reuters DataStream* (TRD). I drop financial institutions due to their unique capital structure and different treatment of leverage (Brav, 2009; Kim & Lee, 2018). Therefore, 960 observations are excluded with the result that 6,615 observations remain in the data set. Further, I remove all rows with missing values. Thereupon, in the applied sample, 5,058 firm-year observations are left. Table 2 shows the further breakdown of the sample by year and Table 3 by industry. As can be seen for the year breakdown, in 2019, lesser observation can be downloaded than in previous years. However, I do not see any structural reasons for this and therefore expect unbiased results. Moreover, to mitigate the influence of outliers and receive a more symmetric distribution in the data, specific variables, such as market value or total assets are transformed with the natural logarithm (see Appendix 2, Figure 3; Hastie, Tibshirani, & Friedman, 2009, p. 259). In Appendix 3, Table 9 provides an overview of all applied variables; this overview also includes all log-transformed variables.

Table 2: Sample breakdown over time

S&P 500		
Year	N	%
2005	257	5.08
2006	268	5.30
2007	283	5.60
2008	317	6.27
2009	337	6.66
2010	347	6.86
2011	355	7.02
2012	367	7.26
2013	369	7.30

2014	384	7.59
2015	404	7.99
2016	410	8.11
2017	415	8.20
2018	401	7.93
2019	144	2.85
Total	5,058	100.00

Source: Author's calculation.

Table 3: Sample breakdown by industry

S&P 500		
Industry	N	%
Technology	556	10.99
Telecommunications	144	2.85
Health Care	626	12.38
Real Estate	391	7.73
Consumer Discretionary	1017	20.11
Consumer Staples	433	8.56
Industrials	971	19.20
Basic Materials	206	4.07
Energy	311	6.15
Utilities	403	7.97
	5,058	100.00

Source: Author's calculation.

Apart from that, to measure the firm's sustainability performance, ESG ratings from the TRD *Asset4* database are employed in the analysis. The TRD *ESG Score* provides information for over 6,000 public firms globally. Most scores are available for firms in North America (2,300 obs.) and Europe (1,400 obs.). Additionally, TRD *Asset4* ratings are of a good reputation towards diligence and trustworthiness (Dorfleitner et al., 2015; Utz, 2018). The ratings are less prone to selection bias and show more relevant results in terms of variability and distribution than considerable ESG ratings (Ioannou & Serafeim, 2011; Desender & Epure, 2015; Dorfleitner et al., 2015). Thus I expect both high quality and density for ESG data in the sample. The valuation procedure considers data from the public domain, e.g., annual reports, NGO websites, and news sources. Human and algorithmic auditors analyze more than 400 metrics in regard to materiality, data availability, and industry relevance. For each of the three individual pillars, environmental, social, and governance, rating scores are provided. Each pillar incorporates weighted categories (see Table 4). The scores range between zero and 100 percent (Refinitiv, 2019). Figure 1 provides an overview of the ESG pillar score distributions by industry (2-digit ICB industry code).

Table 4: TRD ESG Score categories, number of measures, and weights

Environmental			
Category	Resource use	Emissions	Innovation

Number of measures	20	22	19	
Weights	11 %	12%	11%	
Social				
Category	Workforce	Human rights	Community	Product responsibility
Number of measures	29	8	14	12
Weights	16 %	4.5 %	8 %	7 %
Governance				
Category	Management	Shareholders	CSR strategy	
Number of measures	34	12	8	
Weights	19 %	7 %	4.5 %	

The table exhibits the three pillars of ESG, namely environment, social, and governance. Further, it shows the determined categories in each pillar, the number of measures in each category, and the overall weight in the TRD *ESG Score*. Source: Author's illustration based on Refinitiv (2019).

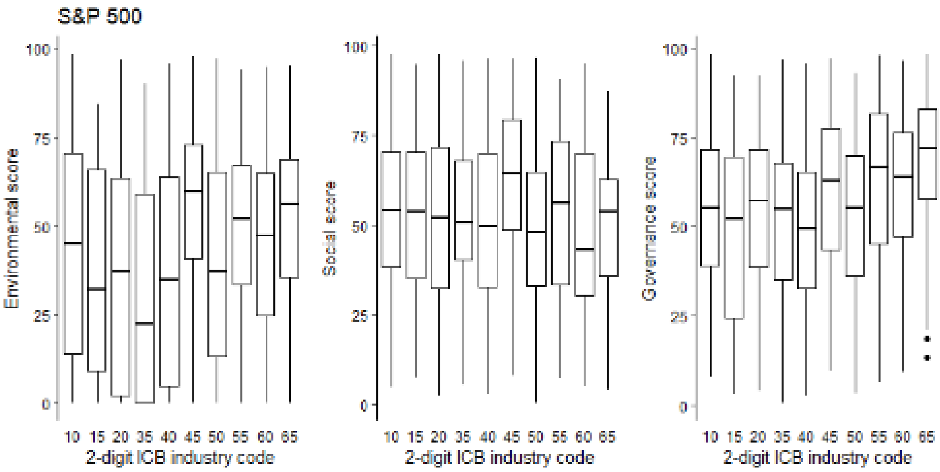

Figure 1: Distribution of ESG ratings by industry for S&P 500 firms
Source: Author's calculation.

4.2 ESG Over-investment Variable Construction

Initially, in each of the three ESG pillars, I measure CSP over-investment with a dummy variable. The construction of the dummy is aligned to the approach of *Fernando* et al. (2017). The authors constructed a measure to categorize the environmental performance of a firm. In doing so, they classified firms as toxic, neutral, and green. Based on the *KLD Research & Analytics, Inc. Environmental Score*, they calculate a net environmental score. In the calculation process, the overall sum of environmental concerns is subtracted from the sum of environmental strengths. As a result, the net environmental score can take on either a negative value (Σ Concerns > Σ Strengths = Toxic firm), a neutral value (Σ Concerns = Σ Strengths = Neutral firm), or a positive value (Σ Concerns < Σ Strengths = Green firm). Conclusively, the authors determine the threshold of environmental over-investment when a firm has a positive net environmental score. Risk management theory and investor preferences, as mentioned in Section 2, justify the threshold. Consequently, based on *Garcia* et al. (2017), I derive and determine the respective mean year-industry pillar performance as the threshold. All firms will be classified as over-investment firms if their performance in the respective ESG pillar is above the corresponding ESG pillar year-industry mean. Finally, I interact the respective over-investment dummies (environmental, social, governance) with the performance in the corresponding ESG pillar. As a result, I expect an advanced measure since not solely a factor variable is used but instead a continuous over-investment measure. I store the interaction-terms in the variables *overinvestEnv*, *overinvestSoc*, and *overinvestGov*. Conclusively, to support my hypothesis **H1** to **H4**, all interaction-terms in the respective model must be negative.

4.3 Empirical Models

In order to conduct the firm-level analyses cross-sectionally and over time, I run a panel data regression with fixed effects as, for instance, executed in *Servaes* and *Tamayo* (2013), *Zhao* and *Murrell* (2016), and *Garcia* et al. (2017). For each model, I conduct the *Breusch-Pagan* test to check for heteroskedasticity, the *F* test to control for the overall significance, and the *Hausman* test to decide whether a fixed or random effects model should be preferred (Baltagi, 2008). In all models, industry fixed effects are applied based on the test results. Even ESG scores vary widely cross-sectional; they do not show much variation for a specific firm over time. Consequently, to avoid the risk of ruling out the effect of ESG pillar scores on firm-level, I do not use firm fixed effects (Servaes & Tamayo, 2013; Arouri & Pijourlet, 2015). Moreover, robust standard errors of type *Arellano* clustered by firm are employed (Arellano, 1987). Additionally, the ESG pillar scores and over-investment interaction terms are lagged one year. Model 1 to Model 4 are used to test my hypotheses **H1** to **H4** and can be illustrated as follows:

$$\begin{aligned} log\ddot{Ma}Cap_{i,t} \;=\; & ß_1 con\ddot{t}rols_{i,t} + ß_2 env\ddot{S}core_{i,t-1} + ß_3 soc\ddot{S}core_{i,t-1} + ß_4 gov\ddot{S}core_{i,t-1} \\ & + ß_5 overin\ddot{v}estEnv_{i,t-1} + ß_6 overin\ddot{v}estSoc_{i,t-1} + ß_7 overin\ddot{v}estGov_{i,t-1} \\ & + \ddot{u}_{i,t} \end{aligned} \quad (1)$$

$$log\ddot{Ma}Cap_{i,t} \;=\; ß_1 con\ddot{t}rols_{i,t} + ß_2 env\ddot{S}core_{i,t-1} + ß_3 overin\ddot{v}estEnv_{i,t-1} + \ddot{u}_{i,t} \quad (2)$$

$$log\ddot{Ma}Cap_{i,t} \;=\; ß_1 con\ddot{t}rols_{i,t} + ß_2 soc\ddot{S}core_{i,t-1} + ß_3 overin\ddot{v}estSoc_{i,t-1} + \ddot{u}_{i,t} \quad (3)$$

$$log\ddot{Ma}Cap_{i,t} \;=\; ß_1 con\ddot{t}rols_{i,t} + ß_2 gov\ddot{S}core_{i,t-1} + ß_3 overin\ddot{v}estGov_{i,t-1} + \ddot{u}_{i,t} \quad (4)$$

In all models, $log\ddot{Ma}Cap_{it}$ represents the dependent variable natural logarithm of market capitalization. In Model 1, the coefficients of interest are $ß_5$ to $ß_7$ since they show the impact of over-investment on firm value. In Model 2 to Model 4, $ß_3$ is the coefficient of interest; it again shows the respective over-investment effect on firm value. Furthermore, established control variables for size (natural log total assets), leverage (natural log of total debt), earnings (operating income divided by sales), and growth (natural log net sales) are stored in the vector $\ddot{controls}_{i,t}$ (Deng et al., 2013; Kaspereit & Lopatta, 2016). In Equation (1) to Equation (4), *i* denotes the firm dimension, *t* is the time-series dimension, and *u* denotes the error term.

5 Empirical Results

5.1 Descriptive Statistics

At first, in Table 5, I present the descriptive statistics. The dependent variable *logMaCap* and independent variables *logTotAs*, *logTotDebt*, and *logNetSales* exhibit symmetric and narrow distributions. Regarding ESG ratings, firms perform best in the governance pillar (Mean = 55.11). While the average performance is the lowest in the environmental pillar (Mean = 42.06). In each pillar, the scores vary widely. For instance, in the environmental pillar, the lowest score is 0.00, and the highest is 98.53. I provide the variance inflation factor (VIF) for the independent variables to check for multicollinearity. None of the observed VIFs is critical.

Table 5: Descriptive statistics S&P 500

S&P 500	N	Mean	St. Dev.	Min	Pctl25	Median	Pctl75	Max	VIF
logMaCap	5,058	16.528	1.095	13.515	15.759	16.409	17.150	20.583	-
logTotAssets	5,058	16.436	1.175	12.585	15.599	16.385	17.225	20.497	4.817
logTotDebt	5,058	14.956	1.719	2.197	14.170	15.146	16.000	20.077	2.036
opIncSales	5,058	0.163	0.111	-0.881	0.097	0.152	0.215	0.682	1.085
logNetSales	5,058	15.997	1.267	11.988	15.137	15.924	16.711	20.077	3.646
environmentScore	5,058	42.055	29.288	0.000	13.405	44.800	67.278	98.530	1.897
socialScore	5,058	52.694	21.858	0.260	35.043	52.905	70.000	97.780	1.866
governanceScore	5,058	55.114	21.968	0.430	39.010	57.490	72.428	98.500	1.185

The descriptive statistics for the variables used in the panel data models are reported. Additionally, I present the median since it is a more robust measure for central tendency than the mean. The standard deviation (St. Dev.) is presented to show the dispersion of a variable relative to its mean. Furthermore, the minimum (Min), the value for the 25 percentile (Pctl25), the 75 percentile (Pctl75), the maximum (Max), and the variance inflation factors (VIF) are presented. Source: Author's calculation.

Besides that, to avoid computational problems within the applied regression models, *Pearson* correlation coefficients are calculated. Table 6 presents the correlation matrix. A high correlation exists between *logTotAssets* and *logTotDebt* as well as *logNetSales*. Other studies also show high correlations between these variables since they are all indicators for firm size; for instance, see *Drempetic* et al. (2019). However, on account of these high correlations, I conduct several robustness tests. Additionally, high correlations between the environmental and governance score must be mentioned. I apply these scores also in separate models to account for this issue. For all control variables, apart from *opIncSales*, a moderate and positive correlation with the three ESG pillar scores can be observed.

Table 6: Correlation matrix for S&P 500 firms

S&P 500	log MaCap	log TotAssets	log TotDebt	opInc Sales	log NetSales	ESG Combi	env Score	gov Score	soc Score
logMaCap	1								
logTotAssets	0.787***	1							
logTotDebt	0.525***	0.784***	1						
opIncSales	0.222***	0.041***	0.020	1					
logNetSales	0.735***	0.799***	0.530***	-0.160***	1				
ESGCombi	0.340***	0.313***	0.279***	-0.001	0.318***	1			
envScore	0.505***	0.495***	0.390***	-0.002	0.499***	0.786***	1		
govScore	0.283***	0.308***	0.264***	-0.021	0.308***	0.642***	0.451***	1	
socScore	0.499***	0.436***	0.354***	0.012	0.432***	0.783***	0.743***	0.413***	1

The Pearson correlation coefficients are presented. ***, ** and * denote statistical significance at the 1, 5, and 10 % levels, respectively. Source: Author’s calculation.

5.2 Panel Data Regressions

Table 7 reports the results of my regression using industry-fixed effects (Model 1 to Model 4). All control variables, except *logTotDebt,* show the economic meaningful and significant (at the one percent level) effect on firm value. The coefficient of *opIncSales* exhibits the highest effect. The results of the overall Model 1 as well as of the three pillar Models 2, 3, and 4 support previous findings in the literature that higher ESG ratings, indicating a better CSP, have a positive effect on firm value (Margolis et al., 2009; Friede et al., 2015; Kaspereit & Lopatta, 2016). Regarding my over-investment hypothesis, the coefficients for the social pillar (*overinvestSoc*) in the overall Model 1 and Model 3 are negative but not statistically significant. However, in the environmental pillar (Model 1 and Model 2), the coefficient *overinvestEnv* is negative and statistically significant at the one percent level. The same holds true for the governance pillar (*overinvestGov*; Model 1 and Model 4). More precisely, the coefficients in these pillars suggest a reduction in firm value for over-investing firms. Furthermore, all models show an adjusted R^2 between 51.9 percent and 52.8 percent. As a result, half of the data's variation is explained by the models. The robust F test statistic shows the overall significance of all models.

Based on this, I state that **H1** for the environmental and governance pillar, **H2**, and **H4** hold true. Nevertheless, I must reject **H3** since the results do not provide significant evidence. Overall, for S&P 500 listed firms, the results suggest that additional environmental and governance performance above the year-industry mean lowers firm value. This might imply that the costs of the respective endeavors outweigh the benefits, which results in lower earnings and c.p. in lower firm value. Furthermore, since market capitalization is used as a dependent variable, it also can be argued that investors evaluate above-average performance as a waste of scarce resources. The results also suggest that inconsistent findings in prior research might occur since the issue of over-investment has not been addressed.

Table 7: Panel data regression result S&P500

	Dependent variable:			
	logMaCap			
	(1)	(2)	(3)	(4)
logTotAssets	0.432***	0.447***	0.443***	0.474***
	(0.054)	(0.054)	(0.055)	(0.057)
logTotDebt	-0.006	-0.003	-0.005	-0.0002
	(0.014)	(0.014)	(0.014)	(0.014)
opIncSales	1.462***	1.498***	1.473***	1.487***
	(0.205)	(0.209)	(0.212)	(0.214)
logNetSales	0.539***	0.537***	0.544***	0.554***
	(0.072)	(0.073)	(0.072)	(0.076)
environmentScoreL1	0.003***	0.004***		
	(0.001)	(0.001)		
socialScoreL1	0.003***		0.005***	
	(0.001)		(0.001)	
governanceScoreL1	0.001			0.003***
	(0.001)			(0.001)
overinvestEnvL1	-0.002***	-0.002***		
	(0.001)	(0.001)		
overinvestSocL1	-0.0004		-0.001*	
	(0.0004)		(0.0004)	

overinvestGovL1	-0.001***			-0.002***
	(0.0004)			(0.0004)
Industry-fixed effects	Yes	Yes	Yes	Yes
Observations	4,555	4,555	4,555	4,555
Adjusted R^2	0.528	0.524	0.524	0.519
F Statistic	552.846***	905.271***	905.903***	889.939***

The industry fixed effects panel data regression for firm value on the respective explanatory variable as defined in Model (1) to (4) are provided. In parenthesis, the clustered and heteroskedasticity-robust standard errors, method "Arellano" (Stock & Watson, 1999), are shown. The ***, **, and * denote statistical significance at the 1, 5, and 10 % levels, respectively. Source: Author's calculation.

The presented results are in line with a concave relation between CSP and CFP provided by *Brammer* and *Millington* (2008). Based on stakeholder theory and a principal-agent conceptualization, the authors theoretically depict that over-investment in CSP might lower CFP. Additionally, the findings of *Utz* (2018) also support my results. For U.S.-based firms, the author provides evidence that CSP and idiosyncratic risk show a non-linear relationship, whereby the latter increases after achieving a CSP score above the optimal value. Hence, higher idiosyncratic risk leads to more unstable business procedures and consequently to lower CFP, i.e., firm value. This implicates that the findings for the environmental and governance pillar (see Table 7) are valid. Consistent with this, *Garcia* et al. (2017) describe the relationship between systematic risk and CSP with a inverted U-shaped curve. Nevertheless, in the following section, I conduct several robustness tests to strengthen my results and to adress the issues mentioned in Sub-section 5.1.

6 Robustness Test

First, I run the identical models on winsorized data. I exclude observations showing a market capitalization below the 1st percentile and over the 99th percentile. As can be seen in Table 10 (see Appendix 4), the regression results show the same effect for over-investment in the environmental and governance pillar. Hence, I state that the results support **H1** for the environmental and governance pillar, **H2**, and **H4**.

As a second robustness test, I conduct a panel data regression with random effects (Garcia, 2017; Sadovnikova & Pujari, 2017) to include additional independent variables, namely over-investment and industry dummies. The inclusion of both results in new insights (see Appendix 5, Table 11). First, industry membership seems to influence the respective over-investment effect since, for the environmental and governance pillar, the over-investment interaction terms are no longer statistically significant. Nevertheless, in the environmental pillar, the over-investment dummy is negative and statistically significant (at the five percent level). On the other hand, in the social pillar, the *overinvestSocialDummy* shows a positive and significant (at the five percent level) effect on firm value. While the interaction term *overinvestSocial* is negative and significant (at the one percent level). These results show that firms above the mean year-industry social score start at a higher intercept, but the coefficient shows a negative slope for over-investment firms. Therefore, further research must investigate the industry-specific over-investment threshold. Besides that, for the investigation, unsupervised machine learning methods can provide further insights by alternatively cluster firms that show congruent attributes, as described in *Sellhorn* (2020).

As applied in *Servaes* and *Tamayo* (2013) and *Aouadi* and *Marsat* (2018), I use the variable accounting-based measure RoA as a dependent variable to check whether ESG over-investment has material implications on firms operating performance. Since market capitalization is a forward-looking market-based performance measure, the effect of CSP on RoA can strengthen the sensitivity of my results (Aouadi & Marsat, 2018). As shown in Table 8, Column (1) to (4), the negative effect of ESG over-investment solely survives in the governance pillar when RoA is used as the dependent variable. This outcome implies that investors' perception plays a crucial role in the over-investment effect, as stated in *Fernando* et al. (2017).

Moreover, in Column (5) to (8), Table 8 presents the results for fixed effects regressions, including systematic risk as an additional control variable (Kaspereit & Lopatta, 2016; Garcia et al., 2017). For all models, the results strengthen my findings. More precisely, the coefficients for CSP are positively related to firm value when systematic risk is included in the regression model. Additionally, as stated in **H1** for the environmental and governance pillar**, H2**, and **H4**, a statistically significant value-destroying effect of ESG over-investment exists. Therefore, the over-investment effect survives even when systematic-riks, an essential control variable in asset pricing, is introduced. Nevertheless, further research might examine the effect by applying asset-pricing models based on the *Fama-French* (1992) and *Carhart* (1997) factor models. This section supports my previous findings that ESG over-investment is associated with lower firm value. Nevertheless, the results also reveal that further research is essential to understand the relation between CSP and firm value.

Table 8: Robustness test different dependent and independent variable

	Dependent variable:							
	Return on Assets				logMaCap			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
logTotAssets	-0.113***	-0.112***	-0.113***	-0.112***	0.439***	0.454***	0.451***	0.482***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.054)	(0.055)	(0.055)	(0.058)
logTotDebt	-0.006*	-0.005*	-0.006*	-0.005*	-0.007	-0.004	-0.006	-0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.014)	(0.014)	(0.014)	(0.014)
logNetSales	0.126***	0.126***	0.125***	0.126***	0.525***	0.523***	0.529***	0.540***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.072)	(0.073)	(0.073)	(0.077)
opIncSales					1.417***	1.454***	1.427***	1.443***
					(0.204)	(0.208)	(0.211)	(0.213)
systematicRisk					-0.073***	-0.072***	-0.075***	-0.072***
					(0.026)	(0.026)	(0.026)	(0.025)
environmentScoreL1	-0.00002	0.0001			0.003***	0.004***		

	(0.0001)	(0.0001)			(0.001)	(0.001)		
socialScoreL1	0.0002*		0.0002*		0.003***		0.005***	
	(0.0001)		(0.0001)		(0.001)		(0.001)	
governanceScoreL1	0.0001			0.0002*	0.001			0.003***
	(0.0001)			(0.0001)	(0.001)			(0.001)
overinvestEnvL1	-0.00004	-0.0001			-0.002**	-0.002***		
	(0.0001)	(0.0001)			(0.001)	(0.001)		
overinvestSocL1	0.00002		0.00001		-0.0003		-0.001*	
	(0.0001)		(0.0001)		(0.0004)		(0.0004)	
overinvestGovL1	-0.0001**			-0.0001**	-0.001***			-0.002***
	(0.00004)			(0.00004)	(0.0003)			(0.0004)
Industry-fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	4,555	4,555	4,555	4,555	4,555	4,555	4,555	4,555
Adjusted R^2	0.289	0.286	0.288	0.287	0.531	0.527	0.527	0.522

The results of the industry-fixed effects panel data regression for return on assets as dependent as well as systematic risk as additional independent variable are provided. In parenthesis, the clustered and heteroskedasticity-robust standard errors, method "Arellano" (Stock & Watson, 1999) are shown. The ***, ** and * denote statistical significance at the 1, 5, and 10 % levels, respectively. Source: Author's calculatio

7 Conclusion

This paper examined the effect of CSP on firm value. Based on previous studies, I derived an advanced ESG over-investment measure (based on Fernando et al., 2017 and Utz, 2018) to provide evidence for the non-linear concave relation between CSP and firm value. I hypothesize that ESG endeavors above the optimal level in this study, the average year-industry CSP, lowers firm value. Additionally, as conducted more frequently in recent research, I examined the effect on all three ESG pillars (Sassen et al., 2016; Fernando et al., 2017; Garcia et al., 2017; Bannier et al., 2019). Using a sample containing U.S. firms listed in the S&P 500 from 2005-2019 in a fixed effects regression model with lagged CSP variables, I first find that higher ESG ratings, namely TRD *Asset4*, are associated with a higher firm value in all models.

Furthermore, the results reveal that over-investment in CSP lowers firm value, at least in the environmental and governance pillar. This supports the hypothesis that the CSP-firm value relation is non-linear and concave. Consequently, my study provides novel insights and opens the discussion on over-investment as a possible approach to explain the inconclusive results and effects of CSP on CFP. Since CSP is susceptible to confirmation bias (Edmans & Ioannou, 2019), this study might sensitize both practitioners and scholars in a way that the effect of CSP is non-linear and therefore not entirely positive or negative.

In a series of robustness tests, the obtained insights are twofold. The first group of tests, among them a regression including systematic risk as an independent variable, supports my findings that ESG over-investment lowers firm value in the environmental and governance pillar. Furthermore, regression results, applying winsorized data, support my previous findings. Besides, the results of the random effects model imply that industry membership might play an essential role in over-investment detection.

In sum, good CSP is not "greenwashing" and can improve firm value. Nevertheless, my results suggest that CSP above a certain threshold indicates over-investment and, therefore, results in lower firm value. As a result, firms must strategically plan their ESG endeavors and assess stakeholder materiality and not be solely "green". However, my findings cannot provide definitive evidence for my over-investment hypothesis. Future research is needed, using larger samples and different regions, as well as extending this line of work by a more in-depth examination of the over-investment threshold. A current trend in literature (Gu et al., 2019; Sellhorn, 2020) might support this examination by applying machine learning techniques, such as unsupervised machine learning methods to find more appropriate cluster groups than just industry membership and test the over-investment effect in these groups.

Appendices

Appendix 1 – CSP and CFP Relationship

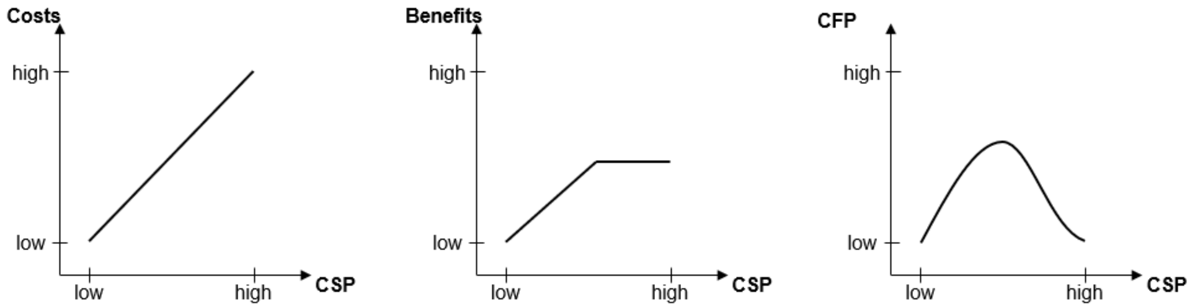

Figure 2: CSP and CFP Relationship
Source: Author's illustration.

Appendix 2 – Firm Value Distribution

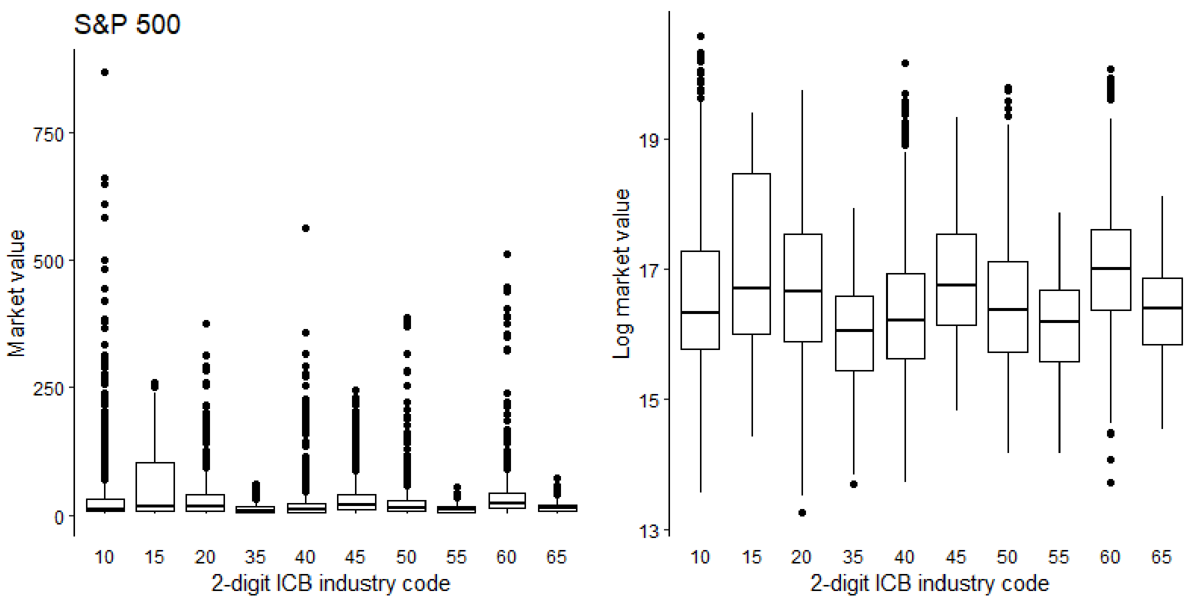

Figure 3: Distribution of market value and log market value by industry.

Source: Author's calculation.

Appendix 3 – Variable Overview

Table 9: Variable overview.

Variable	Class	Description
ID	numeric	Unique number for every observation
firmName	character	Firm name
Year	numeric	Year of observation
MV	numeric	Market value of the respective observation
divYield	numeric	Dividend payed as a percentage of the share price
totAssets	numeric	Total assets of the respective observation
totDebt	numeric	Total debt of the respective observation
opIncome	numeric	Operating income of the respective observation
netSales	numeric	Net sales for the respective observation
equityBeta	numeric	CAPM equity beta
indICB2digit	factor	Two-digit ICB industry classification
ind4digit	factor	Four-digit ICB industry classification
industryICB	factor	Eight-digit ICB industry classification
CEOBoard	factor	1 if CEO is also a member of the board
chairmanCEOSep	factor	1 if CEO is also chairman of the board
boardDiversity	numeric	Percentages of women on the board
boradSize	numeric	Number of members on the board
ESGCombined	numeric	TRD ASSET4 ESG Combined Score
ESGScore	numeric	TRD ASSET4 ESG Score
ESGControversies	numeric	TRD ASSET4 ESG Controversy Score
environmentScore	numeric	TRD ASSET4 environmental pillar score
socialScore	numeric	TRD ASSET4 social pillar score
governanceScore	numeric	TRD ASSET4 governance pillar score
logMaCap	numeric	Natural logarithm of variable *MV*
logTotAssets	numeric	Natural logarithm of variable *totAssets*
logTotDebt	numeric	Natural logarithm of variable *totDebt*
opIncSales	numeric	Variable *opIncome* divided by *netSales*
logNetSales	numeric	Natural logarithm of variable *netSales*

Source: Author’s illustration.

Appendix 4 – Robustness Test Winsorized Data

Table 10: Robustness test for H1 to H4 with winsorized data

	Dependent variable: logMarketCap			
(control variables omitted)	(1)	(2)	(3)	(4)
logTotAssets	0.431***	0.446***	0.443***	0.475***
	(0.054)	(0.055)	(0.055)	(0.058)
logTotDebt	-0.006	-0.003	-0.005	-0.0003
	(0.014)	(0.014)	(0.014)	(0.014)
opIncSales	1.471***	1.508***	1.483***	1.496***
	(0.207)	(0.211)	(0.214)	(0.217)
logNetSales	0.536***	0.534***	0.541***	0.551***
	(0.072)	(0.073)	(0.073)	(0.077)
environmentScoreL1	0.003***	0.004***		
	(0.001)	(0.001)		
socialScoreL1	0.003***		0.005***	
	(0.001)		(0.001)	
governanceScoreL1	0.001			0.003***
	(0.001)			(0.001)
overinvestEnvL1	-0.002***	-0.002***		
	(0.001)	(0.001)		
overinvestSocL1	-0.0004		-0.001*	
	(0.0004)		(0.0004)	
overinvestGovL1	-0.001***			-0.002***
	(0.0004)			(0.0004)
Industry-fixed effects	Yes	Yes	Yes	Yes
Observations	4,503	4,503	4,503	4,503
Adjusted R^2	0.526	0.521	0.521	0.516
F Statistic	541.725***	886.342	887.124***	870.705***

The results of the industry-fixed effects panel data regression with winsorized data are provided. In parenthesis, the clustered and heteroskedasticity-robust standard errors, method "Arellano" (Stock & Watson, 1999) are shown. The ***, ** and * denote statistical significance at the 1, 5, and 10 % levels, respectively. Source: Author's calculation.

Appendix 5 – Robustness Test Random Effects Regression

Table 11: Robustness test for H1 to H4 with random effects including industry dummies and over-investment dummies

	Dependent variable: logMarketCap			
(control variables and industry dummies omitted)	(1)	(2)	(3)	(4)
environmentScoreL1	0.003***	0.004***		
	(0.001)	(0.001)		
socialScoreL1	0.005***		0.006***	
	(0.001)		(0.001)	
governanceScoreL1	0.001			0.003***
	(0.001)			(0.001)
overinvestEnvDummyL1	-0.092**	-0.078*		
	(0.041)	(0.040)		
overinvestSocDummyL1	0.120**		0.094*	
	(0.057)		(0.057)	
overinvestGovDummyL1	-0.028			-0.049
	(0.055)			(0.055)
overinvestEnvL1	0.0001	-0.0001		
	(0.001)	(0.001)		
overinvestSocL1	-0.003***		-0.003***	
	(0.001)		(0.001)	
overinvestGovL1	-0.001			-0.001
	(0.001)			(0.001)
Constant	2.521***	2.468***	2.324***	2.781***
	(0.244)	(0.244)	(0.237)	(0.233)
Observations	4,555	4,555	4,555	4,555
Adjusted R^2	0.852	0.850	0.849	0.844
F Statistic	26,115.500***	25,726.400***	25,570.150***	24,686.710***

The results of random effects panel data regression using industry and over-investment dummies are provided. In parenthesis, the clustered and heteroskedasticity-robust standard errors, method "White" are shown.
The ***, ** and * denote statistical significance at the 1, 5, and 10 % levels, respectively.
Source: Author's calculation.

List of References

Albuquerque, R., Koskinen, Y., & Zhang, C. (2019). Corporate Social Responsibility and Firm Risk: Theory and Empirical Evidence. Management Science, Vol. 65, pp. 4451-4469.

Aouadi, A., & Marsat, S. (2018). Do ESG Controversies Matter for Firm Value? Evidence from International Data. Journal of Business Ethics, Vol. 151, pp. 1027-1047.

Arouri, M., & Pijourlet, G. (2015). CSR Performance and the Value of Cash Holdings: International Evidence. Journal of Business, Vol. 140, pp. 263–284.

Baboukardos, D. (2018). The Valuation Relevance of Environmental Performance Revisited: The Moderating Role of Environmental Provisions. The British Accounting Review, Vol. 50, pp. 32-47.

Baltagi, B. H. (2005). Econometric Analysis of Panel Data; Third Edition. Chichester: John Wiley & Sons Ltd.

Bannier, C. E., Bofinger, Y., & Rock, B. (2019). Doing Safe by Doing Good: ESG Investing and Corporate Social Responsibility in the U.S. and Europe. Working Paper University of Giessen, pp. 1-33.

Bhuiyan, M. B., & Hooks, J. (2019). Cash Holding and Over-Investment Behavior in Firms with Problem Directors. International Review of Economics and Finance, Vol. 61, pp. 35-51.

Brammer, S., & Millington, A. (2008). Does It Pay to Be Different? An Analysis of the Relationship between Corporate Social and Financial Performance. Strategic Management Journal, Vol. 29, pp. 1325-1343.

Brav, O. (2009). Access to Capital, Capital Structure, and the Funding of the Firm. Journal of Finance, Vol. 64, pp. 263-308.

Brown, W., Helland, E., & Smith, J. (2006). Corporate philanthropic practices. Journal of Corporate Finance, Vol. 12, pp. 855-877.

Carhart, M. M. (1997). On Persistence in Mutual Fund Performance. Journal of Finance, Vol. 52, pp. 57–82.

Cheng, B., Ioannou, I., & Serafeim, G. (2014). Corporate Social Responsibility and Access to Finance. Strategic Management, Vol. 35, pp. 1-23.

Deng, X., Kang, J.-K., & Low, B. S. (2013). Corporate Social Responsibility and Stakeholder Value Maximization: Evidence from Mergers. Journal of Financial Economics, Vol. 110, pp. 87-109.

Desender, K., & Epure, M. (2015). Corporate Governance and Corporate Social Performance: Boards, Ownership and Institutions. Academy of Management Proceedings, pp. 16433-16433.

Ding, S., Knight, J., & Zhang, X. (2019). Does China Overinvest? Evidence from a Panel of Chinese Firms. The European Journal of Finance, Vol. 25, pp. 489-507.

Dorfleitner, G., Halbritter, G., & Nguyen, M. (2015). Measuring the Level and Risk of Corporate Responsibility – An Empirical Comparison of Different ESG Rating Approaches. Journal of Asset Management, Vol. 16, pp. 450-466.

Drempetic, S., Klein, C., & Zwergel, B. (2019). The Influence of Firm Size on the ESG Score: Corporate Sustainability Ratings Under Review. Journal of Business Ethics, pp. 1-28.

Edmans, A., & Ioannou, I. (2019). Financial Times. Retrieved from www.ft.com: https://www.ft.com/content/54f96d4e-82ec-11e9-9935-ad75bb96c849, 8-13-2020

EU. (2020a). ec.europa.eu. Retrieved from https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en

EU. (2020b). www.eur-lex.europa.eu. Retrieved from http://data.europa.eu/eli/reg/2020/852/oj; 23.10.2020

Fama, E. F., & French, K. R. (1992). The Cross-Section of Expected Stock Returns. Journal of Finance, Vol. 47, pp. 427–465.

Fernando, C. S., Sharfman, M. P., & Uysal, V. B. (2017). Corporate Environmental Policy and Shareholder Value: Following the Smart Money. Journal of Financial and Quantitative Analysis, Vol. 52, pp. 2023-2051.

Fieseler, C. (2011). On the Corporate Social Responsibility Perceptions of Equity Analysts. Business Ethics: A European Review, Vol. 20, pp. 131-147.

Flammer, C. (2015). Does Corporate Social Responsibility Lead to Superior Financial Performance? A Regression Discontinuity Approach. Management Science, Vol. 61, pp. 2549-2568.

Freeman, R. E. (1984). Strategic Management: A Stakeholder Approach. Boston: Pitman.

Friede, G., Busch, T., & Bassen, A. (2015). ESG and Financial Performance: Aggregated Evidence from more than 2000 Empirical Studies. Journal of Sustainable Finance & Investment, Vol. 5, pp. 210-233.

Fu, F. (2010). Overinvestment and the Operating Performance of SEO Firms. Financial Management, Vol. 39, pp. 249-272.

Garcia, A. S., Mendes-Da-Silva, W., & Orsato, R. J. (2017). Sensitive Industries Produce Better ESG Performance: Evidence from Emerging Markets. Journal of Cleaner Production, Vol. 150, pp. 135-149.

Gu, S., Kelly, B., & Xiu, D. (2019). Empirical Asset Pricing via Machine Learning. Working Paper University of Chicago and Yale University, pp. 1-79.

Handelmann, J. M., & Arnold, S. J. (2001). The Role of Marketing Actions with a Social Dimension: Appeals to the Institutional Environment. Journal of Marketing, Vol. 22, pp. 33-48.

Hastie, T., Tibshirani, R., & Friedman, J. (2009). The Elements of Statistical Learning - Data Mining, Inference, and Prediction, Second Edition. New York: Springer-Verlag.

Ioannou, I., & Serafeim, G. (2011). The Consequences of Mandatory Corporate Sustainability Reporting. Working Paper Harvard Business School, pp. 1-45.

Kaspereit, T., & Lopatta, K. (2016). The Value Relevance of SAM´s Corporate Sustainability Ranking and GRI Sustainability Reporting in the European Stock Markets. Business Ethics: A European Review, Vol. 25, pp. 1-24.

Kim, S., & Lee, B. B. (2018). The Value Relevance of Capital Expenditures and the Business Cycle. Studies in Economics and Finance, Vol. 35, pp. 386-406.

Köhler, P., & Landgraf, R. (2020). www.handelsblatt.de. Retrieved from https://www.handelsblatt.com/finanzen/banken-versicherungen/esg-kriterien-blackrock-greift-beim-klimaschutz-durch/26000222.html?ticket=ST-1749881-p6vC4EDdXaCWB9ofGUdx-ap3; 23.10.2020

Kunz, J. (2020). Corporate Social Responsibility and Employees Motivation—Broadening the Perspective. Schmalenbach Business Review, Vol. 72, pp. 159-191.

Lee, D. D., & Faff, R. W. (2009). Corporate Sustainability Performance and Idiosyncratic Risk: a Global Perspective. Financial Review, Vol. 44, pp. 213-237.

Linthicum, C., Reitenga, A., & Sanchez, J. (2010). Social Responsibility and Corporate Reputation: The Case of the Arthur Andersen Enron Audit Failure. Journal of Accounting and Public Policy, Vol. 29, pp. 160-176.

Malik, M. (2015). Value-Enhancing Capabilities of CSR: A Brief Review of Contemporary Literature. Journal of Business Ethics, Vol. 127, pp. 419-438.

Margolis, J. D., & Walsh, J. P. (2003). Misery Loves Companies: Rethinking Social Initiatives by Business. Administrative Science Quarterly, Vol. 48, pp. 268-305.

Margolis, J. D., Elfenbein, H. A., & Walsh, J. P. (2009). Does it Pay to Be Good...and Does It Matter? Working Paper Harvard Business School, pp. 1-68.

McWilliams, A., & Siegel, D. (2001). Corporate Social Responsibility: A Theory of the Firm Perspective. Academy of Management Review, Vol. 26, pp. 117-127.

Mooney, A., Miller, J., & Smith, P. (2020). www.ft.com. Retrieved from https://www.ft.com/content/92512bcc-48b3-11ea-aee2-9ddbdc86190d, 23.10.2020

Orlitzky, M. (2015). The Politics of Corporate Social Responsibility or: Why Milton Friedman Has Been Right All Along. Annals in Social Responsibility, Vol. 1, pp. 5-29.

Refinitiv. (2019). www.refinitiv.com. Retrieved from https://www.refinitiv.com/en/financial-data/company-data/esg-research-data#find-out-more; 09.05.2020

Sadovnikova, A., & Pujari, A. (2017). The Effect of Green Partnerships on Firm Value. Journal of the Academy of Marketing Science, Vol. 45, pp. 251–267.

Sassen, R., Hinze, A.-K., & Hardeck, I. (2016). Impact of ESG Factors on Firm Risk in Europe. Journal of Business Economics, Vol. 86, pp. 867-904.

Sellhorn, T. (2020). Machine Learning und empirische Rechnungslegungsforschung: Einige Erkenntnisse und offene Fragen. Schmalenbachs Zeitschrift für betriebswirtschaftliche Forschung, Vol. 72, pp. 49-69.

Servaes, H., & Tamayo, A. (2013). The Impact of Corporate Social Responsibility on Firm Value: The Role of Customer Awareness. Management Science, Vol. 59, pp. 1045-1061.

Smith, C. N. (2003). Corporate social responsibility: Whether or how? California Management Review, Vol. 45, pp. 52-76.

Titman, S., Wei, K. J., & Xie, F. (2004). Capital Investments and Stock Returns. Journal of Financial and Quantitative Analysis, Vol. 39, pp. 677-700.

Utz, S. (2018). Over-investment or risk mitigation? Corporate social responsibility in Asia-Pacific, Europe, Japan, and the United States. Review of Financial Economics, Vol. 36, pp. 167-193.

Valentine, S., & Fleischman, G. (2008). Ethics Programs, Perceived Corporate Social Responsibility and Job Satisfaction. Journal of Business Ethics, Vol. 77, pp. 159-172.

Vishwanathan, P., van Oosterhout, H., Heugens, P., Duran, P., & van Essen, M. (2020). Strategic CSR: A Concept Building Meta-Analysis. Journal of Management Studies, Vol. 57, S. 314-350.

Zhao, X., & Murrell, A. (2016). Revisting the Corporate Social Performance-Financial Performance Link: A Replication of Waddock and Graves. Strategic Management Journal, Vol. 37, pp. 2378-2388.

Zingales, L. (2020). www.promarket.org. Retrieved from https://promarket.org/2020/10/13/milton-friedman-legacy-doctrine-theorem/; 23.10.2020