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Abstract

This paper examines the order of stakeholder preferences in the ESG practices of 706 European listed companies between 2009 and 2020. Our research aims to scrutinize which stakeholders benefit the most from the ESG activities of the firms. Based on the ESG scores of Refinitiv, our model uses LASSO regressions to determine which ESG activities and categories have the highest marginal contribution to the overall ESG performance. Our main results show an implied hierarchy of stakeholder preferences in ESG strategy, which differs over time, across the ESG performance of the firms and economic sectors. Concerning the governance and social pillar-related ESG activities, internal stakeholders, i.e., the board, and the employees, are preferred to external ones to internalize the ESG impacts for higher ESG scores. Meanwhile, firms with higher ESG scores prefer suppliers via their environmental ESG activities.

Acknowledgement

Introduction

Environmental, Social, Governance (ESG) scores are tools for sustainable finance, which provide a complex measure to indicate the corporate commitment to environmental sustainability and social responsibility. Several theories have been developed in the academic literature over the past decades around corporate social responsibility and ESG policies.

In the shareholder theory, firms are responsible only for their shareholders and neutral in social responsibility (Friedman 1970). Therefore, firms choose shareholder value maximization as their governing objective; thus, the market value of equity is maximized in the long term (Rappaport 2006). In contrast to shareholder theory, the stakeholder theory states that firms have social and moral responsibilities due to the negative externalities they create in the society and the environment (Freeman et al. 2010). Mauboussin–Rappaport (2016) argued that balancing many stakeholder interests is challenging for firms, so narrowing the governing objectives benefits the firms. However, the expectations of other stakeholders can be met with good communication. In our paper, we argue that we can consider ESG scores as an extended measure of corporate governance. Firms choose ESG activities to prioritize stakeholders in their ESG strategy to optimize their stakeholder value creation and enhance the firm's shareholder value. Thus, we can observe the stakeholder preferences of the firms via the ESG scores.

This paper aims to scrutinize the stakeholder preferences by examining the ESG scores of European listed firms. Using the ESG scores, we identify which stakeholder groups benefit the most from the ESG strategies of the firms. In our conceptual model, the stakeholder groups will be aligned with the different categories of the Refinitiv ESG scores. The marginal contribution of the ESG categories will be measured to determine the hierarchy of stakeholders in the ESG strategy of the firms. Our research contributes to the literature by providing empirical evidence concerning the ESG strategy-based stakeholder models.

Our paper proceeds as follows: first, recent literature is introduced to build up our conceptual model. After the introduction of the sample and the descriptive statistics, LASSO regressions are run to assess the marginal contribution of the ESG categories to the overall scores and to determine the relative importance of the different stakeholder groups.

Literature review

There is a positive relationship between ESG scores and market capitalization (Gregory 2022). The importance of ESG pillars has been changing over time for investors. Over the 2002-2009 timeframe, Australian Securities Exchange 300 firms improved on the governance pillar at a greater rate than environmental or social ones (Galbreadth 2013). According to an automatent content analysis of 150,000 electronic documents related to the S&P/TSX Composite Index from 1999 to the end of 2014, the analysis of information relevance and financial materiality highlighted that the effect of ESG disclosure more sensitive to the social component affected the stock prices more (Schiehll – Kolahgar 2020). Bennani et al. (2018) found that ESG scores started to be integrated into stock prices after 2013/14. A turning point in environmental and governance pillars was identified around 2013/2014 in line with a radical break related to ESG integration in North America and Eurozone, while the social pillar gained momentum and attracted investors later in 2016 (Drei et al. 2019). The most common ESG disclosure was related to the governance pillar, followed by social and environmental ones in Thai listed companies, based on content analysis by word counting (Suttipun 2021). The governance performance has the highest effect on financial performance, including return on assets and Tobin's Q, as opposed to environmental and social pillars (Velte 2017). Superior performance on social and governance issues was achieved in sensitive industries among 812 listed European companies (Qureshi et al. 2019). Social and governance pillars have a significant positive effect on Distance-to-Default risk metrics. Meanwhile, the environmental pillar seems to be irrelevant (Ignatov 2021). The social pillar attracted more investor attention after the COVID period, and higher governance scores contributed to better corporate resilience during the turbulent market environment due to the pandemic (Lepetite et al. 2021). ESG activities related to the social and governance pillars have been dominant in line with global trends over the past years. These global trends can guide firms toward optimizing their ESG activities in their ESG strategy to achieve better ESG performance. Based on the recent literature, we argue that stakeholder groups related to the social and governance pillar ESG activities are the main beneficiaries of the ESG strategy of the listed firms.

H1: Stakeholder groups related to the social and governance pillar ESG activities are the main beneficiaries of the ESG strategy of the listed firms.

Agency theory assumes that managers as agents are more likely to engage in social and environmental issues than shareholders as principals (Waddock – Graves 1997). In line with the stakeholder theory, the management has to keep a good relationship with stakeholders for good economic performance (Ullmann 1985). The Business Roundtable (BRT 2019) explicitly states that businesses exist to serve multiple stakeholders, including customers, employees, communities, the environment, and suppliers, in addition to shareholders. Based on this statement, Kay–Brindisi–Martin (2020) created a stakeholder model describing how firms optimize their stakeholder value creation via their ESG strategies. In this model, prioritizing internal stakeholders, such as employees and management, can lead to positive externalities toward external stakeholders. However, employment relations exhibit a diverse nature in terms of country clusters and firm size (Bedo–Demirbag–Wood 2011). ESG information disclosure to all stakeholders is a way to develop a competitive advantage for increased corporate sustainability performance (Alsayegh – Rahman –Homayoun 2020). Firms with high ESG performance issue more ESG reports to send signals to the shareholders and other stakeholders (Uyar – Karaman – Kilic 2020). ESG practices aim to meet stakeholders' expectations; ESG controversies significantly negatively impact financial performance, based on a database of 356 European listed companies (Nirino et al. 2021). Shareholder vs. stakeholder conflicts of interest explain why private firms reduce their adverse ESG incidences more after United Nation Global Compact engagement than public firms (Li – Wu 2018). Firms have to consider communities and the environment as stakeholders, while companies prefer profit maximization at the expense of ESG degradation (Freeman et al. 2021). ESG hedge funds can act as "ESG arbitrageurs" to initiate firm-specific ESG activism representing the Big Three, i.e., Blackrock, Vanguard, and State Street, in line with a new agency cost theory within the framework of "sustainable capitalism" (Christie, 2021). The conflict of interest between ESG advocates and the beneficiaries of investment funds, i.e., mainly retail investors, is a challenging question for the SEC (Mahoney – Mahoney 2021).

Managing the conflicts of interest between the shareholders and stakeholders, the board, which works for shareholder wealth maximization, is key. However, external pressures have significantly shaped corporate governance practices (Bedo–Ozsvald 2008). There is a strong relationship between the governance pillar scores and the fundamental value of equity. On the other hand, there is no relationship between the value of equity and the environmental and social pillar scores (de la Fuente–Ortiz–Velasco 2022). There is a positive relationship between the quality of integrated reporting and the board size, diversity, and independence (Chouaibi – Chouaibi – Zouari 2021). Board network centrality leads to better social capital, well-managed

stakeholder pressure, and higher ESG performance (Harjoto – Wang 2020). The board has options to align the management with shareholder wealth maximization. Companies with public commitments to ESG and stronger monitoring face a higher probability of dismissing the CEO after negative coverage of ESG issues (Burke 2022). There is evidence of a managerial role in ESG resource allocation to increase shareholders' value (Welch – Yoon 2020). The positive impact of ESG scores on financial performance is amplified by CEO power (Velte 2020). Therefore, among stakeholders, the board, as agents of the shareholders, enjoys preference in ESG activities. The recent literature argues that ESG activities related to board have a higher relative importance in the ESG strategy of the firms.

H2: ESG activities related to the board has a higher relative importance in the ESG strategy of the firms.

Better relationships with primary stakeholders like employees, customers, suppliers, and communities result in improved shareholder value, while broader issues of society reduce it (Hillman – Keim 2001). The risk-averse customers and suppliers are sensitive to signals of counterparty risk related to ESG issues such as environmental breaches, unsafe workplaces, or recalled products (Coleman 2011). Edmans – Pu – Zhang (2022) find a link between employee satisfaction and stock returns in ESG investing. After a certain level, firms cannot increase their profit per employee so that their ESG footprint is not increasing simultaneously (Bhandari– Ranta–Salo 2022). According to the recent literature, we can argue that the internal stakeholders can benefit more from the ESG strategy of the listed firms.

H3: The stakeholders' distance from shareholders affects the relative importance of the ESG activities in the ESG strategy of the European listed firms; thus, internal stakeholders are preferred.

Data and methodology

In our conceptual model, we align the stakeholder model of Kay–Brindisi–Martin (2020) with the Refinitiv ESG scores to assess the marginal contribution of specific category scores to the overall scores and the embedded priority of stakeholders. Table 1. introduces the Refinitiv ESG scores, which include 186 firm-level ESG measures grouped into 10 ESG categories related to the 3 main pillars. Environmental pillar-related ESG activities are incorporated into resource use, emissions, and innovation categories. The Social pillar includes the categories of the workforce, human rights, community, and product responsibility. Finally, the governance pillar comprises management, shareholders, and CSR strategy categories.

Table 1.: Refinitiv ESG scores

Refinitiv ESG scores			
ESG pillar scores	Environmental pillar	Social pillar	Governance pillar
ESG category scores	Resource use	Workforce	Management
	Emissions	Human rights	Shareholders
	Innovation	Community	CSR strategy
		Product responsibility	

Figure 1. shows our stakeholder model in which we align the categories with the stakeholder groups. In our model, we match the stakeholder groups with the ESG categories of Refinitiv based on the ESG activities covered by the different categories. ESG category scores measure the performance of the firms concerning related ESG activities. By forming an ESG strategy, firms choose ESG activities to optimize the stakeholder value creation based on their stakeholder preferences, which leads to enhanced shareholder value creation. Thus, the relative importance of the ESG categories to the overall ESG scores reflects the stakeholder preferences of the firms in their ESG strategy. By examining the ESG scores and estimating the weights of the ESG categories in the overall ESG performance of the firms, we can measure the relative importance of the different ESG categories, and we can assess the order of priority in the case of the different stakeholders.

Figure 1: The stakeholder model

	Internal stakeholders			External stakeholders			
	Shareholders	Management	Employees	Customers	Communities	Suppliers	Environment
Refinitiv ESG categories	Shareholder	Management	Workforce, Human Rights	Product responsibility, Innovation	Communities, CSR strategy	Resource use	Emissions
ESG activities related to Refinitiv ESG categories	Equal voting rights, Shareholder engagement, Equal shareholder rights	Board size, Board independence, Board diversity, Board experience, Executive compensation	Health and safety, Training and development, Skill training, Career development, Diversity, and opportunity, Employee satisfaction, Salary gap, Injuries, Child labor, Forced labor, Freedom of Association, Human rights	Customer health and safety, Data privacy, Cyber security, Responsible marketing, Fairtrade, Quality management Environmental products, Eco-design, Products recovered from recycling, Green products, GMO products, Agrochemical products, Labeled wood	Fair competition, Bribery and corruption, Business ethics, Community involvement, Donations, Voluntary work, SDG: zero hunger, no poverty, etc.	Environmental supply chain management and monitoring, Sustainable packaging, Water efficiency, Energy efficiency,	CO2, waste, water pollution reduction, Accidental spills reduction, Biodiversity impact reduction
Stakeholder impact	Long-term investors, Mitigate governance risk, Focus on performance	Incentivized management, Long-term focus	Engagement, Innovation, Productivity, Retention, Diversity	Loyalty, Brand premium, Word of mouth	Public Image, License to operate, Community Partnership	Reputation, Interdependency, Trust	Climate change
Stakeholder prioritization							
Optimized stakeholder value creation							
Enhanced shareholder value creation							

Our sample consists of European listed firms with ESG scores data available from Refinitiv for every financial year between 2009 and 2020. Thus, we investigated 706 firms in 12 financial years. To determine the category scores, Refinitiv uses a percentile rank methodology. The category weights are calculated for the different industry groups based on the Thomson Reuters Business Classification (TRBC). The time series of category and pillar weights are not available; only the weights of the recent financial year are known publicly. Our sample includes the ESG scores, the pillar scores, and the category score of the selected firms.

Table 2. shows the descriptive statistics of the Refinitiv ESG scores and categories in the selected period. In this table, we present the means of the ESG scores and the category scores, the standard deviation of the scores in parentheses, and we highlight the category with the highest means in every financial year. We can observe that the highest score is achieved in the workforce category on average firms, and they improve this score continuously year by year. This suggests that employees are an important stakeholder group for the firms.

Table 2.: Descriptive statistics of the Refinitiv ESG scores and categories

N=706	fy2009	fy2010	fy2011	fy2012	fy2013	fy2014	fy2015	fy2016	fy2017	fy2018	fy2019	fy2020
ESG Score	48.35	50.82	52.22	52.94	53.38	54.17	56.88	58.04	60.30	62.71	64.83	67.25
	(21.25)	(20.58)	(20.74)	(19.90)	(19.73)	(19.40)	(19.05)	(18.79)	(18.07)	(17.88)	(16.67)	(16.06)
Community Score	44.27	49.69	49.64	51.21	51.35	53.09	56.55	56.93	60.01	60.60	62.39	64.09
	(29.91)	(30.08)	(29.42)	(28.96)	(28.87)	(29.19)	(30.68)	(31.50)	(29.78)	(29.45)	(28.73)	(27.93)
CSR Strategy Score	40.59	44.20	46.16	47.51	47.73	48.75	50.45	52.28	55.06	61.22	64.01	67.83
	(32.68)	(31.81)	(31.04)	(30.07)	(30.13)	(29.98)	(29.80)	(29.21)	(28.40)	(27.05)	(25.56)	(24.96)
Emissions Score	52.72	56.82	57.83	58.56	59.46	58.91	61.34	62.94	64.46	65.75	69.10	71.34
	(32.50)	(31.12)	(30.70)	(29.80)	(29.30)	(29.61)	(29.02)	(27.91)	(27.18)	(26.86)	(24.60)	(23.59)
Human Rights Score	29.43	31.60	35.40	37.82	39.28	42.46	45.38	48.67	55.80	60.86	64.78	66.41
	(34.90)	(35.28)	(36.19)	(36.42)	(36.55)	(36.33)	(36.17)	(36.47)	(33.88)	(31.52)	(29.25)	(27.61)
Innovation Score	30.67	32.74	34.04	35.82	35.83	36.21	37.68	38.26	39.92	41.20	43.35	43.90
	(33.49)	(33.64)	(33.80)	(33.86)	(33.67)	(33.62)	(33.96)	(33.83)	(34.22)	(34.46)	(34.26)	(34.10)
Management Score	50.55	51.30	52.51	52.23	52.27	53.22	55.29	54.66	55.76	60.82	63.95	70.03
	(29.02)	(28.60)	(28.78)	(29.04)	(29.05)	(28.75)	(27.99)	(28.56)	(28.15)	(26.90)	(25.23)	(22.64)
Product Responsibility Score	45.20	47.75	49.55	49.86	50.39	51.70	57.50	60.72	63.14	64.11	65.23	66.56
	(34.20)	(34.24)	(33.64)	(33.46)	(33.61)	(33.43)	(32.11)	(31.81)	(30.32)	(29.20)	(27.64)	(26.66)
Resource Use Score	52.81	56.07	58.14	59.17	59.26	59.04	61.05	62.15	64.25	65.65	68.76	70.24
	(33.24)	(31.60)	(31.62)	(30.72)	(30.59)	(30.56)	(30.04)	(29.24)	(28.79)	(28.19)	(26.26)	(25.27)
Shareholders Score	51.80	52.21	52.02	51.87	51.90	51.73	52.83	52.31	51.62	54.13	53.89	58.04
	(28.84)	(28.97)	(28.79)	(28.45)	(28.59)	(28.35)	(28.30)	(28.98)	(28.19)	(28.32)	(28.46)	(27.07)
Workforce Score	**66.59**	**68.37**	**69.17**	**68.94**	**70.00**	**70.10**	**73.26**	**75.57**	**77.06**	**76.69**	**76.93**	**76.37**
	(26.23)	**(24.69)**	**(24.58)**	**(24.15)**	**(23.35)**	**(23.38)**	**(22.05)**	**(20.76)**	**(19.66)**	**(19.89)**	**(19.81)**	**(20.17)**
Note: Standard deviation in parentheses												

To examine the marginal contribution of the categories to the ESG performance of the European listed firms, we have to estimate the weights of categories since Refinitiv does not provide time series data about the weights. Similarly to Berg–Kölbel–Rigobon (2019), we perform non-negative least squares regressions for every financial year in the selected period. In the case of the weight estimations, we do not consider the heterogeneity of the weights across industry groups. Thus, we can estimate the implicit weights behind the ESG scores and create our own linear aggregation rule based on the category scores. The estimated weights show the relative importance of the ESG categories since Refinitiv determines the weights based on the appearance of the activities in the ESG reports. Thus, those categories get higher weights, where the related activities appear more often in the ESG reports.

We estimate the weights of the categories according to equation (1) in a way that we standardize the dependent and the explanatory variables and apply a constraint that the coefficients cannot be negative. With the help of standardization, we can exclude the intercept term and estimate the standardized category weights.

$$ESG_i^{std} = \sum_{j=1}^{10} c_{i,j}^{std} \cdot w_j^{std} + \varepsilon_i \ , \qquad\qquad w_j \geq 0 \qquad\qquad (1)$$

where ESG_i^{std} denotes the standardized ESG scores of the firms, $c_{i,j}^{std}$ denotes the standardized firm level category scores, w_j^{std} denotes the standardized category weights, and ε_i is the error term.

To estimate the ESG scores according to our aggregation rule, first, we have to convert the coefficients of equation (1) to their unstandardized form with the help of equation (2).

$$\widehat{w_j} = w_j^{std} \cdot \frac{s_{ESG}}{s_{c,j}} \qquad\qquad (2)$$

where $\widehat{w_j}$ denotes the estimated, unstandardized category weights, s_{ESG} denotes the standard deviation of ESG scores, and $s_{c,j}$ denotes the standard deviation of the category scores.

After that, we can recreate the ESG scores according to our aggregation rule and examine the marginal contribution of categories to the ESG performance according to equation (3).

$$\widehat{ESG}_i = \sum_{j=1}^{10} c_{i,j} \cdot \widehat{w_j} \qquad\qquad (3)$$

where $\widehat{w_j}$ denotes the estimated, unstandardized category weights, $c_{i,j}$ denotes the category scores, and $\widehat{ESG}_i$ denotes the estimated ESG scores.

Table 3. introduces the descriptive statistics of the category weight estimations. We estimated equation (1) for every financial year, converted the category weights to their unstandardized form, and calculated the descriptive statistics of the weight estimations. We also highlight the highest category weight according to the different statistics. Weight statistics are in percentages. Therefore, we can observe that the management category has the highest weight, with a mean of 21.11%. After the weight estimations, we calculated the ESG scores based on our aggregation rule and determined the root mean squared errors (RMSE) of the estimations to compare the estimated ESG scores with the original ones. The mean of the root mean squared

errors is 3.19 points, which means that the average difference between the estimated and the original ESG scores is 3.19 points. This shows that our estimation gives back the original ESG scores reasonably well, even though we do not consider the industrial heterogeneity in the weights. This result shows that, on average, board-related ESG activities are the most important in the ESG strategy of the firms.

Table 3.: Implicit weights of the ESG categories

| ESG categories	Mean	Standard Deviation	Min	Median	Max	Number of observations
Community Score	10.69	0.60	9.80	10.71	11.68	12
CSR Strategy Score	3.76	0.30	3.28	3.67	4.35	12
Emissions Score	9.74	0.83	8.81	9.49	11.23	12
Human Rights Score	9.56	0.69	8.41	9.81	10.66	12
Innovation Score	7.54	0.30	7.03	7.47	7.93	12
Management Score	**21.11**	0.65	**20.08**	**21.04**	**21.86**	12
Product Responsibility Score	8.95	0.50	8.09	8.99	9.78	12
Resource Use Score	9.18	0.59	8.11	9.09	10.46	12
Shareholders Score	6.21	0.30	5.78	6.13	6.86	12
Workforce Score	13.71	0.72	12.26	13.85	14.44	12
RMSE	3.19	0.10	2.99	3.21	3.32	12

Stakeholder prioritization in the ESG practice of European listed firms

To answer our research questions, we examine the marginal contribution of the ESG categories to the overall ESG performance of the firms. This allows us to assess the stakeholder preferences of the firms based on their ESG strategy.

Figure 2. presents the marginal contribution of the ESG category scores based on the implicit category weight estimations. We calculated the marginal contribution of the categories as the product of the implicit weights and the category score averages in every financial year. This way, the sum of the marginal contributions equals the means of the estimated ESG scores. As we can see, the means of the estimated ESG scores follow a similar trend as the original ESG scores in Table 2. Management and workforce categories have higher marginal contributions than the other categories, with an average of 11.85 and 9.92 points contribution. CSR strategy and Innovation have the lowest contribution with an average of 2.84 and 1.96 points contribution. In our stakeholder model, we matched these leading categories with the management and employee stakeholder groups. Suppose we accept that ESG scores describe the stakeholder preferences of the firms via the related ESG activities. In that case, we can

observe that European listed firms prioritize their stakeholders so that employees and management are the main beneficiaries of their ESG strategy. ESG activities related to the board of the firms, executive compensation, health and safety, career development, and employee satisfaction dominate the firms' ESG strategy.

Figure 2.: Marginal contribution of the ESG categories
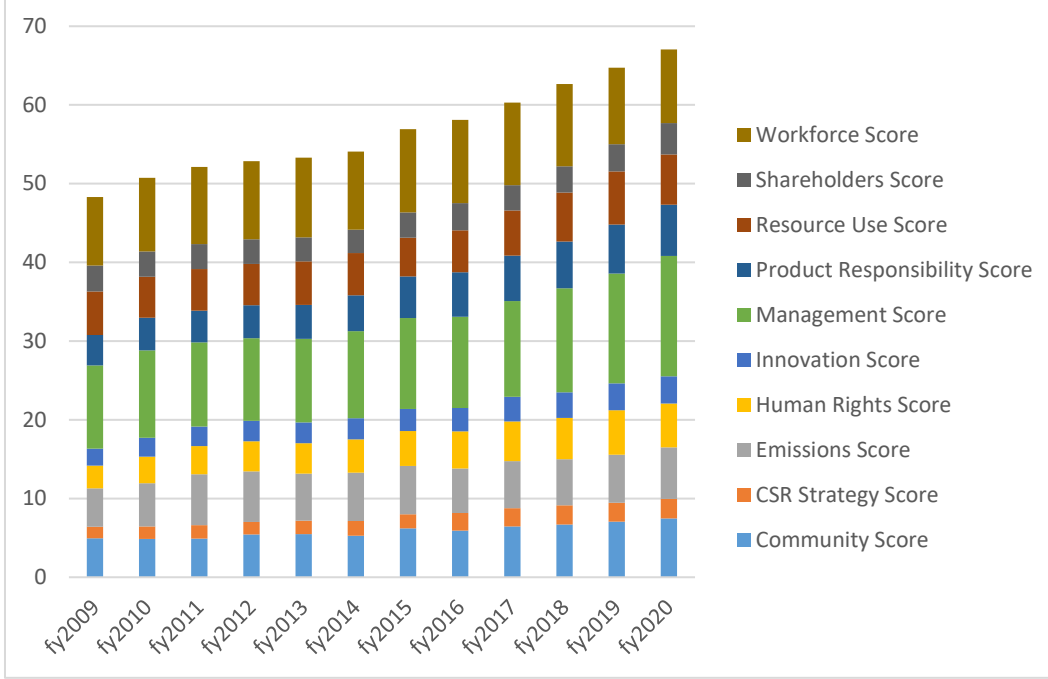
To investigate the relative importance of the ESG categories, we run LASSO regressions and estimate equation (1) with a penalty on the weight coefficients. Moreover, the LASSO estimator adds a regularization parameter to the minimization problem of the ordinary least squares estimator according to equation (4).

$$\min_{w_j^{std}} \sum_j (ESG_i^{std} - c_{i,j}^{std} \cdot w_j^{std})^2 + \lambda \cdot \sum_j |w_j^{std}| \qquad (4)$$

With the penalty (λ) increasing, the w_j^{std} coefficients go toward zero; thus, we can eliminate the categories with the smallest marginal contribution until only one category is left. Our objective is to reduce the number of categories and find the combination of categories that can explain the ESG performance of the firms well. That way, we can assess the stakeholder preferences of the firms and can determine the order of stakeholder priority in the ESG strategy of the firms.

First, we divide our sample into a train and a test period to examine our model's predictive power. Next, we train our models with different degrees of penalty on the ESG data in every financial year. We then predict the ESG scores according to that model every other financial year to calculate how well our models give back the original ESG scores over time. Finally, to examine the impact of the degree of penalty on the predictive power of our model, we apply 10-fold cross-validation, which estimates the mean squared error for the different degrees of penalty by dividing our train period into deciles.

Figure 3. shows the results of 10-fold cross-validation in the financial year of 2009. In this figure, we present the mean squared errors (MSE) with a 95% confidence interval for the different degrees of penalty measured with the logarithm of the λ parameter. The first dotted line shows the optimal value of λ with minimal error. In contrast, the second dotted line shows the highest penalty with the fewest parameter within 1 standard error of the optimal value of λ. In both cases, the model includes all 10 ESG categories. We can also observe that if we increase the lambda parameter further, the model eliminates the categories with the lowest marginal contribution. However, the MSE does not increase much until the model includes only 2 or 3 categories. This suggests that we can explain the ESG scores of the firms with fewer categories well.
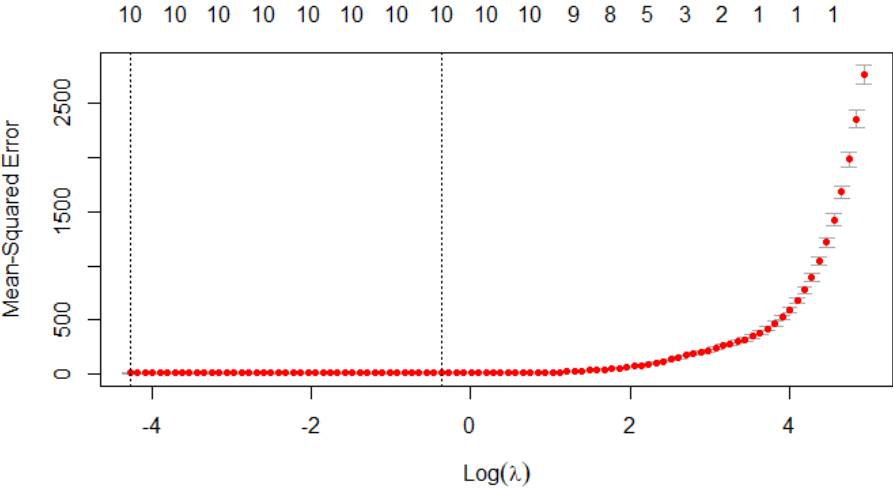
Figure 3.: 10-fold cross-validation

Table 4. presents the result of the LASSO regressions in the case of the whole sample in the financial year of 2009. We introduce only those models where one category was first eliminated. With the degree of penalty increasing, the estimator eliminates more and more categories with the lowest marginal contribution. That way, we can rank the categories according to their marginal contribution, and we can observe how much they explain the ESG performance of the firms. First, the estimator eliminated the category of CSR strategy, then innovation and human rights, and after that, product responsibility and emissions. The first three categories with the highest marginal contribution were the category of workforce, management, and community. The explanatory power of the models only slightly dropped. The workforce category explains almost 90% of the ESG score variability, and its weight increased from 15.1 % to 57.9 %. In the table, we also present the within-sample RMSE and the average out-of-sample RMSE of the models with its standard deviation based on the financial years between 2010-2020. In model M8, where only three categories are included, the average difference between the original and the estimated ESG score is 13.13 points within the sample and, on average, 15.43 points out of the sample with a standard deviation of 1.8 points between 2010-2020. These results show that firms prioritize stakeholders, and the employees, the board, and the communities are at the top of their preference list. The stakeholder groups related to social and governance pillar activities are the main beneficiaries of the firms' ESG strategy. The board and the employee-related activities have a higher relative importance, and the distance to shareholders impacts the order of priority. In 2009, the ESG activities related to boards, executive compensation, employee satisfaction, and business ethics formed the stakeholder preferences of the firms.

Table 4.: LASSO regressions

Model	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10
$Log(\lambda)$	-0.37	1.31	1.68	1.87	2.14	2.24	2.61	2.7	2.8	3.26
Community Score (%)	11.20	11.20	11.00	10.50	8.80	7.90	3.40	1.30	-	-
CSR Strategy Score (%)	2.80	-	-	-	-	-	-	-	-	-
Emissions Score (%)	8.80	8.40	7.70	6.90	4.90	3.90	-	-	-	-
Human Rights Score (%)	8.90	4.40	1.50	-	-	-	-	-	-	-
Innovation Score (%)	6.00	1.80	-	-	-	-	-	-	-	-
Management Score (%)	20.70	19.10	18.10	17.40	16.10	15.30	11.50	10.25	8.70	-
Product Responsibility Score (%)	8.00	5.30	3.80	2.70	0.20	-	-	-	-	-
Resource Use Score (%)	10.80	10.70	10.10	9.50	7.30	6.40	0.40	-	-	-
Shareholders Score (%)	5.90	3.30	1.90	1.00	-	-	-	-	-	-
Workforce Score (%)	15.10	24.50	29.70	33.20	39.90	42.30	53.80	55.60	56.70	57.90
R2 (%)	99.61	99.03	98.40	97.95	97.06	96.70	94.46	93.82	93.23	89.90
Within-sample RMSE	3.30	5.21	6.68	7.56	9.05	9.59	12.43	13.13	13.73	16.78
Out-of-sample RMSE	3.26 (0.18)	5.83 (0.48)	7.69 (0.81)	8.79 (1.01)	10.54 (1.24)	11.18 (1.32)	14.54 (1.69)	15.43 (1.80)	16.22 (1.91)	20.09 (2.48)

Note: Standard deviation in parentheses

In Table 5. we show how the relative importance of the ESG categories changed over time. We present only those models which include the first three categories with the highest marginal contribution in every financial year. In some cases, like in the financial year of 2011, 2017, and 2020, the estimator was indecisive concerning the ranking; thus, in these cases, we present more categories in the table. The table shows that only five categories dominated the first three places in the ranking, and the focus shifted between the different ESG categories over time. In 2009, the workforce was the most important category with a weight of 55.6%, the management got second place with 10.25%, and the community had a third place with a 1.3% weight. As firms achieved higher and higher ESG scores over time, the focus shifted from the category of community, with an average weight of 0.69%, towards the category of resource use, with an average weight of 1.6%, and emissions, with an average weight of 1.52%. Thus, prioritizing supplier and environment-related ESG activities allowed the firms to achieve higher ESG

scores. On average, these models have an explanatory power of 95.39% and a within-sample RMSE of 12.61 points. These results show that ESG activities related to internal stakeholders have a higher relative importance in the ESG strategy of the firms. The distance to shareholders has a crucial impact on the prioritization of ESG activities. The board and the employees managed to keep their place as the most important stakeholders for the firms. Stakeholder groups related to the social and governance pillars are main beneficiaries of the ESG strategies. Supplier-related ESG activities gained momentum over time. The firms externalize only the environmental pillar-related ESG activities.

Table 5.: Marginal contribution over time

Financial year	Community Score (%)	Emissions Score (%)	Management Score (%)	Resource Use Score (%)	Workforce Score (%)	$Log(\lambda$	R^2 (%)	Within-sample RMSE	Out-of-sample RMSE
fy2009	1.30	-	10.25	-	55.60	2.70	93.82	13.13	15.43 (1.80)
fy2010	1.40	-	11.22	-	57.02	2.73	94.51	12.85	14.22 (1.60)
fy2011	0.97	1.44	7.98	-	60.24	2.68	95.11	12.43	13.80 (1.41)
fy2012	0.36	-	3.91	-	64.13	2.88	93.96	13.90	14.83 (1.57)
fy2013	0.27	-	5.58	-	64.22	2.75	94.68	13.13	14.16 (1.37)
fy2014	0.05	-	4.76	-	64.88	2.85	94.26	13.78	14.30 (1.42)
fy2015	0.38	-	3.05	-	68.41	2.71	95.16	13.19	13.76 (1.05)
fy2016	-	-	3.56	2.07	67.10	2.62	95.43	13.04	13.32 (0.98)
fy2017	0.80	-	4.64	2.43	67.57	2.54	96.20	12.27	12.54 (0.67)
fy2018	-	-	6.88	1.69	69.48	2.66	96.64	11.95	12.14 (0.44)
fy2019	-	-	8.73	1.56	69.89	2.69	97.25	11.10	11.89 (0.46)
fy2020	-	1.60	17.16	0.24	63.65	2.89	97.65	10.59	10.84 (0.49)
Average	0.69	1.52	7.31	1.60	64.35	2.72	95.39	12.61	-

Note: Standard deviation in parentheses

Our previous finding in Table 5. suggested that the stakeholder preferences of the European listed firms differ across the ESG performance of the firms. As the ESG scores increased over time, the importance of the different ESG activities changed. With the prioritization of supplier-related ESG activities, the firms achieved better ESG performance. Thus in Table 6., we present the models, which include the first three categories with the highest marginal contribution by sorting firms into terciles each period based on the ESG scores. We only present the low and the high tercile models, and in the cases where the estimator was indecisive, we present more categories in the table.

Table 6.: Marginal contribution by the ESG score terciles

				ESG Score						
				Low tercile (N=236)						
Financial year	Community Score (%)	Emissions Score (%)	Management Score (%)	Resource Use Score (%)	Shareholders Score (%)	Workforce Score (%)	$Log(\lambda)$	R^2 (%)	Within-sample RMSE	Out-of-sample RMSE
fy2009	-	-	0.53	-	3.45	28.68	2.88	75.15	12.72	20.64 (5.18)
fy2010	-	-	7.78	-	0.04	34.69	2.72	84.65	11.21	16.18 (4.44)
fy2011	-	-	1.75	-	0.89	37.43	2.95	80.27	13.48	16.91 (4.71)
fy2012	-	-	0.89	-	0.50	40.66	2.93	81.86	13.62	16.02 (4.47)
fy2013	-	-	1.74	-	0.82	42.47	2.82	85.20	12.50	14.88 (4.14)
fy2014	-	-	0.58	-	1.65	40.12	3.00	82.92	13.89	15.85 (4.52)
fy2015	-	-	8.69	-	0.08	46.14	2.47	91.90	10.54	11.49 (3.03)
fy2016	-	-	11.36	-	0.41	45.90	2.20	93.21	10.01	10.66 (2.73)
fy2017	0.15	-	8.54	-	0.69	50.93	2.17	94.42	9.79	10.46 (2.13)
fy2018	-	-	6.44	-	0.17	53.86	2.59	93.62	11.09	10.71 (1.95)
fy2019	-	-	10.96	1.41	-	54.73	2.59	94.92	10.68	9.80 (1.07)
fy2020	-	1.74	17.89	0.01	-	50.95	2.81	94.96	11.31	8.89 (0.42)
Average	0.15	1.74	6.43	0.71	0.87	43.88	2.68	87.75	11.74	-
				High tercile (N=235)						
Financial year	Community Score (%)	Emissions Score (%)	Human Rights Score (%)	Management Score (%)	Resource Use Score (%)	Workforce Score (%)	$Log(\lambda)$	R^2 (%)	Within-sample RMSE	Out-of-sample RMSE
fy2009	-	0.17	-	-	16.43	62.24	3.22	98.14	9.93	11.45 (1.29)
fy2010	-	32.02	-	0.22	0.77	51.33	2.30	98.68	8.52	9.14 (0.84)
fy2011	-	3.03	-	-	0.71	77.59	3.26	98.35	9.73	10.53 (0.94)
fy2012	-	0.52	-	-	13.72	68.68	2.70	98.56	9.04	9.48 (0.80)
fy2013	-	0.78	-	-	22.07	60.25	2.81	98.57	9.02	9.20 (0.80)
fy2014	-	1.23	-	-	22.25	61.31	2.48	98.73	8.55	8.66 (0.64)
fy2015	1.45	-	-	-	23.31	62.03	2.07	99.10	7.37	8.28 (0.67)
fy2016	-	-	-	0.28	14.76	71.33	2.07	99.06	7.62	8.72 (0.73)
fy2017	-	-	-	1.49	9.62	76.46	2.09	99.12	7.47	8.78 (0.92)
fy2018	-	-	-	2.25	14.61	72.22	2.38	99.16	7.45	8.48 (1.15)
fy2019	-	-	0.93	0.66	20.02	68.49	2.31	99.33	6.72	8.60 (1.25)
fy2020	-	-	-	0.50	37.76	52.14	3.00	99.30	6.95	8.39 (1.23)
Average	1.45	6.29	0.93	0.90	16.34	65.34	2.56	98.84	8.20	-

Note: Standard deviation in parentheses

In the case of the low tercile firms, six categories dominated the ranking. The workforce category has the highest weight, with an average of 43.88 %, and then comes the management category with 6.43 %. An interesting observation is that in the third place, we find the shareholders category in most financial years. In the case of the high tercile firms, we find that next to the workforce category, the resource use category has the highest weight, with 16.34% on average. We can observe a shift from the emissions category to management in 2016. On average, the explanatory power of the models is 87.75% in the case of the low tercile firms with a within sample RMSE of 11.74 points and 98.84% in the case of the high tercile firms with a within sample RMSE of 8.2 points. This finding suggests that focusing on shareholder-related activities results in lower ESG scores while prioritizing suppliers can result in better ESG performance concerning the European listed firms. Firms with a higher ESG performance tend to internalize the governance and social ESG activities and externalize the environmental

activities. The distance to shareholders is important for the firms. The board and the employees stayed in the focus of the ESG strategy of the firms.

In Table 7., we introduce the models, which include the first three highest marginal contributions by sorting the firms into economic sectors based on the Thomson Reuters Business Classification scheme (TRBC). We only present the three economic sectors with the highest representation among the European listed firms with ESG scores available in the investigated period. When the estimator was indecisive, we presented more than three categories. Concerning the industrials next to the workforce category, with an average weight of 61.61 %, the management and the community categories seem important to the firms. In 2018, the resource use category came forward.

Regarding the consumer cyclicals next to the workforce category, the emissions with an average weight of 5.96% and the management with an average weight of 2.79% appear as an important preference in the ESG strategy of the firms. In the case of the financials, the workforce and the management categories have the highest marginal contributions, with average weights of 55.91% and 16.7 %, respectively. We can also observe a shift from the community category towards resource use and emissions in the last three years. On average, the explanatory power of the models is 94.58% with a within-sample RMSE of 13.19 points in the case of the industrials, 95.96% with a within-sample RMSE of 12.15 points regarding the consumer cyclicals, and 96.34% with a within-sample RMSE of 10.82 points concerning the financials. These findings suggest that employee-related ESG activities have the highest priority for the firms, but the preferences differ across the economic sectors. Concerning industrials and financials, the board and the communities-related ESG activities dominated the stakeholder preferences initially. However, recently we can see a shift towards supplier-related ESG activities as firms achieved better ESG performance. It is also an interesting observation that regarding consumer cyclicals, the environment plays an important role too.

Table 7.: Marginal contribution by economic sectors

TRBC Industrials (N=127)

Financial year	Community Score (%)	Emissions Score (%)	Human Rights Score (%)	Management Score (%)	Resource Use Score (%)	Workforce Score (%)	$Log(\lambda)$	R^2 (%)	Within-sample RMSE	Out-of-sample RMSE
fy2009	2.16	-	-	3.48	-	55.99	2.93	92.34	13.95	18.07 (2.88)
fy2010	0.99	-	-	0.34	-	57.67	3.23	90.55	16.13	19.26 (3.24)
fy2011	6.42	-	-	0.10	-	59.00	2.94	93.89	13.51	15.94 (2.67)
fy2012	13.95	0.88	-	0.03	-	54.01	2.86	94.35	13.10	14.20 (2.54)
fy2013	1.11	2.36	-	-	-	63.14	2.96	92.73	14.96	15.61 (2.47)
fy2014	7.14	-	-	0.79	-	61.16	2.94	93.80	13.94	14.33 (2.30)
fy2015	4.17	-	-	-	1.09	66.17	2.84	95.06	13.17	13.90 (1.80)
fy2016	1.55	-	-	-	8.24	62.09	2.72	95.44	12.66	13.53 (1.77)
fy2017	5.89	-	-	-	1.88	67.13	2.42	96.57	11.32	13.05 (1.22)
fy2018	-	-	-	2.63	1.36	72.53	2.84	95.74	13.12	13.28 (0.93)
fy2019	-	-	0.65	6.04	-	73.05	3.05	96.79	11.93	12.83 (0.70)
fy2020	-	-	-	34.63	1.46	47.40	3.16	97.68	10.53	11.26 (0.55)
Average	4.82	1.62	0.65	6.00	2.81	61.61	2.91	94.58	13.19	-

TRBC Consumer Cyclicals (N=105)

Financial year	Community Score (%)	Emissions Score (%)	Human Rights Score (%)	Management Score (%)	Product Responsibility Score (%)	Resource Use Score (%)	Workforce Score (%)	$Log(\lambda)$	R^2 (%)	Within-sample RMSE	Out-of-sample RMSE
fy2009	-	1.46	-	4.34	-	-	58.84	2.78	92.86	14.41	15.74 (2.13)
fy2010	0.77	10.21	-	-	-	-	55.54	2.70	94.28	13.16	14.54 (2.03)
fy2011	-	6.24	-	-	-	1.36	61.34	2.61	95.66	11.93	13.66 (1.62)
fy2012	-	3.35	-	-	-	1.55	65.18	2.54	96.01	11.64	13.44 (1.40)
fy2013	0.20	-	-	0.94	-	4.02	66.07	2.28	96.28	11.33	13.13 (1.27)
fy2014	-	5.30	-	-	-	1.48	64.66	2.50	95.68	12.48	12.86 (1.37)
fy2015	0.66	5.21	-	2.07	0.42	-	65.35	2.34	96.24	12.02	12.29 (1.15)
fy2016	-	9.10	-	-	-	0.97	63.37	2.32	96.41	12.06	12.24 (1.20)
fy2017	-	12.45	-	0.39	-	-	63.06	2.15	97.09	11.14	11.81 (0.98)
fy2018	-	3.72	0.72	0.61	-	1.23	70.41	2.35	96.95	11.71	12.29 (0.99)
fy2019	-	-	-	5.95	0.70	-	72.36	2.56	97.19	11.46	12.31 (0.99)
fy2020	-	2.56	-	5.22	-	-	70.96	3.25	96.88	12.51	12.06 (0.99)
Average	0.54	5.96	0.72	2.79	0.56	1.77	64.76	2.53	95.96	12.15	-

TRBC Financials (N=124)

Financial year	Community Score (%)	CSR Strategy Score (%)	Emissions Score (%)	Human Rights Score (%)	Management Score (%)	Resource Use Score (%)	Workforce Score (%)	$Log(\lambda)$	R^2 (%)	Within-sample RMSE	Out-of-sample RMSE
fy2009	2.42	-	-	-	15.46	-	50.26	2.59	94.80	12.02	13.40 (1.42)
fy2010	1.53	-	-	-	15.05	-	52.97	2.61	95.20	11.87	12.75 (1.22)
fy2011	0.76	-	-	-	16.65	-	53.33	2.58	95.51	11.59	12.21 (1.10)
fy2012	1.65	-	-	-	21.40	-	49.23	2.54	96.07	10.70	11.50 (1.07)
fy2013	0.65	-	-	-	18.26	-	51.63	2.66	95.59	11.33	12.26 (1.15)
fy2014	0.82	-	-	-	15.81	-	54.42	2.61	95.45	11.56	12.14 (1.03)
fy2015	1.97	-	-	-	15.51	-	55.95	2.30	96.38	10.71	11.36 (0.73)
fy2016	0.73	1.42	-	0.03	19.91	-	53.53	2.20	96.86	10.23	10.44 (0.58)
fy2017	0.71	-	-	-	17.39	-	58.03	2.33	96.78	10.95	10.64 (0.43)
fy2018	-	-	-	-	15.79	0.89	62.08	2.16	97.52	9.95	10.67 (0.51)
fy2019	-	-	-	-	13.39	1.48	64.78	2.23	97.91	9.43	11.05 (0.55)
fy2020	-	-	1.73	-	15.81	-	64.75	2.41	98.07	9.48	10.95 (0.90)
Average	1.25	1.42	1.73	0.03	16.70	1.19	55.91	2.44	96.34	10.82	-

Note: Standard deviation in parentheses

Discussion and conclusions

In this paper, we examined the stakeholder preferences of European listed firms. We hypothesized that firms choose ESG activities based on their stakeholder preferences to optimize stakeholder value creation and enhance shareholder value. In our stakeholder model, we suggested using ESG scores as an extended measure of corporate governance, and we aligned the ESG categories of Refinitiv with the different stakeholder groups.

Using the Refinitiv ESG scores, we estimated the implicit weights of ESG category scores. Next, we examined the marginal contribution of the categories to measure the relative importance of the ESG categories and map the stakeholder preferences of the firms. Finally, we applied LASSO regressions to rank the categories according to their marginal contribution and select the most important categories for the firms with different attributes.

Higher ESG category weights show that the related ESG activities appear more often in the ESG reports of the European listed firms. Thus, the implication of our results lies in the fact that those firms which follow the trends and prioritize similar ESG activities in their ESG strategy as their industry group competitors can achieve a better ESG performance over time. Our results contribute to the existing literature by providing empirical evidence for the ESG strategy-based stakeholder models.

In the H1 hypothesis, we posit that following the global trends, stakeholder groups related to the social and governance pillar ESG activities are the main beneficiaries of the ESG strategy of the listed firms. Furthermore, we find that ESG activities related to the board and the employees dominate the ESG strategy of the European listed firms over time, across economic sectors, and the ESG performance. Thus, we accept the H1 hypothesis.

In the H2 hypothesis, we stated that ESG activities related to the board has a higher relative importance in the ESG strategy of the firms. We find that, on average, the board-related ESG activities have the highest weight among the ESG categories. Thus, we can conclude that the relative importance of the board-related ESG activities is high concerning the ESG strategy of the European listed firms, and we can accept the H2 hypothesis.

In the H3 hypothesis, we stated that the stakeholders' distance from shareholders affects the relative importance of the ESG activities in the ESG strategy of the European listed firms; thus, internal stakeholders are preferred. We find that the distance to shareholders does matter in the ESG strategy of the European listed firms. Firms prefer internal stakeholders to external ones. The prioritization of shareholder-related activities results in lower ESG scores, while the prioritization of suppliers can result in better ESG performance. Firms can achieve better ESG performance if they internalize the social and governance ESG activities by serving the interests

of the employees and the board and externalize the environmental ESG activities by serving the interests of their suppliers. Thus, we can accept the H3 hypothesis.

In recent years ESG activities related to the board, career development, health and safety, skill training, employee diversity, employee satisfaction, executive compensation, and environmental supply chain management have dominated the ESG strategy of the European listed firms and form their stakeholder preferences towards the employees, the board and the suppliers, who benefit the most from the ESG strategy of the firms.

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