The link between CEO incentive structure and Environmental, Social and Governance rating.

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Abstract

Using a panel of U.S. firms from 2000 to 2018, we investigate how the structure of CEO compensation affects a firms' Environmental, Social and Governance (ESG) rating. In particular, we see how the ratio of long term focused compensation over total compensation impacts a firms' ESG pillar scores and overall ESG rating. Using a fixed effects estimator with industry fixed effects we find a highly significant relationship between the Long Term Compensation ratio (LTR) and ESG rating and the Environmental and Social pillar individually. These results remain significant even when controlling for differences on the CEO and firm level. We extend the investigation into this relationship by exploring the additional explained variance in ESG ratings due to the inclusion of CEO- and year fixed effects. In accordance with previous literature, including auxiliary fixed effect explains a significant amount of variation in the dependant variable, with the R-squared increasing as much as 62.3% for overall ESG rating. We further investigate the potential existence of interaction effects between industry and long term compensation on ESG pillar rating. We find significant interaction terms for both the Environmental and the Governance pillar.

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Introduction

Over the last years, there has been an increasing interest in sustainable investing due to great demand by institutional and retail investors alike. For instance, at the beginning of 2021, a Carbon-readiness Exchange Traded Fund (ETF) by BlackRock debuted and became the largest ETF launch in history with over 1 billion US dollars invested on day one (Marsh & Potter, 2021). In the United States, investments using sustainable strategies rose to 12 trillion dollars, increasing almost 40% since 2016. (Global Sustainable Investment Alliance, 2018). In 2019 around 200 billion was raised by firms across the world through Green bonds (Smith, 2020). The driving force behind this push for more investments that respects social and environmental boundaries stems from growing climate concerns, policy signals and, more recently, the COVID-19 pandemic, which has drawn more attention to the environment (OECD, 2020).

This new trend of investing in a socially responsible manner has manifested itself primarily through Environmental, Social and Governance (ESG) practices, which has become increasingly prevalent with a market coverage of 25% in the U.S. (OECD, 2020). Incorporating ESG data in investments goes beyond Socially responsible investing (SRI). SRI often represents an investment that aligns with specific values; ESG looks at issues representing long-term value creation in companies. There are also significant differences between ESG investing and impact investing. In particular, Impact investing is related to directing money to resolve targeted issues, while ESG relates to the rating of strategies and investments (Global Sustainable Investment Alliance, 2018). With the growing demand on the investor side, the need for firms to incorporate corporate social responsibility also increases. As the decisions with regards to investments policies and governance practices are at the discretion of the CEO of the firm, it is essential to study the determinants of the decisions made by top executives.

This paper investigates the structure of CEO compensation and its implications for a firm's willingness to make CSR investments beyond legal requirements, as measured by a firms' ESG rating. In the sections below, we will first describe the role of CEO incentive structures on executive behaviour and discuss some of the previous literature on this topic, emphasising CSR decisions and ESG investments. After this, we discuss the development of our hypotheses. We study the direct relationship between the ratio of long term compensation on the pillars of ESG as well as the moderation of industry on this relationship. Consequently, we provide a description of the sample and the methodology used to answer the hypotheses. In the presentation of our results, we find significant and positive coefficients for all ESG pillars, except governance and total ESG rating. Furthermore, we can identify significant interaction effects for the social and governance pillar. We close this paper by discussing

some of the limitations of the study and recommendations for future research.

Framework

2.1 Executive compensation

At its very core, decisions by people are made by comparing costs and benefits. Effectively, incentives can change the cost and/or benefits and therefore influence how people behave. This is precisely the thought behind Mankiw's fourth principle of economics: "People respond to incentives" (Mankiw, 2014). The theory of incentives has long been an important topic in economics, with various notable economists recognizing the intricate dynamic between principal and agent. Adam Smith, in the third book of The Wealth of Nations, recognizes that granting 'tenants' a portion of the produce of a land will give them an interest that the whole produce would be as great as possible, effectively aligning incentives with the land 'masters' (Smith, 1776). Charles Babbage posed a general system of compensation that was based on the principle that a large portion of the workers' wages should directly depend on the profits of the company (Laffont & Martimort, 2009). Barnard further expanded the literature on incentives in his book "The Function of the Executive", highlighting the necessity and importance of managerial incentives and differentiating between various specific and general types of incentives (Barnard, 1968).

In order to align the interest of the executives with that of the shareholders, there are broadly two types of control mechanisms, external and internal (Walsh & Seward, 1990). External control mechanisms refer to the market for corporate control. When internal controls to improve management have not been employed or proven unsuccessful, an acquisition by a different company with better management can become a compelling option for shareholders. This creates a competitive environment for the incumbent executives where the threat of an external takeover can work as a disciplinary tool (Walsh & Seward, 1990).

The board of directors employs internal control mechanisms to incentivize their agents, be it compensation or dismissal. In order to avoid shirking by executives, their incentives can be altered by changing, for example, the magnitude of their compensation or amending the compensation structure (Walsh & Seward, 1990). In general, executive compensation across firms and industries contains four similar ingredients, as described in Murphy's "Handbook of labor economics" (1999). First of all, Chief Executive Officers (CEOs) receive a base salary on par with industry standards. According to Murphy (1999), the industry standard is customarily determined through a survey design that accounts for various firm-level differences, in particular, firm size. While base salaries are not necessarily the most significant component, it plays an integral part for executive as it acts as the fixed

element of total compensation. When executives do not have a stake in the company, they have an incentive to maximize their earnings rather than that of the firm, mainly by improving their fixed salary (Boyd, 1994). Furthermore, the risk averse officer will always prefer an increase in their fixed salary above an increase in any performance-dependent income (Murphy, 1999).

The second component of compensation is annual bonus plans. These plans are strictly based on the company's performance that year. The performance of executives is assessed, and they are offered a monetary bonus up to a certain maximum (Murphy, 1999). Performance measured are highly firm and industry specific; however, mainly, accounting measures such as Economic Value Added (EVA) or EBIT determine the bonuses. While annual bonus plans are successful in providing an incentive for executives to increase the company's profits, Murphy (1999) argues that the backwards-looking and short term nature of accounting measures consequently means that officers will forgo greater long-term profits in favour of better annual performance to the detriment of the firm.

The third component of executive compensation discussed in the "Handbook of labor economics" are stock options. By offering executives a stake in the company, their incentives become more aligned with that of the owners. Compensation through stock options implies that the value of the compensation is directly tied to the value of the shares. Consequently, this stake in the firm can incentivize executives to pursue long-term value creation rather than remaining fixated on improving short-term accounting ratios (Murphy, 1999). On the other hand, as options provide downside protection and thus benefit from higher volatility, they provide agents with an incentive to take more considerable risks, potentially harming the company (Murphy, 1999).

The last form of compensation discussed by Murphy is other compensation forms such as long-term incentive plans (LTIPs) and retirement plans. LTIPs are similar in structure to annual bonuses, with the differentiating factor being that performance is measure over a 3-to 5-year period (Murphy, 1999).

Besides incentivizing executives to pursue firm value, the structure of internal control mechanism can be used to prioritize specific goals and objectives. Mahoney and Thorne (2005) investigate the nature of the relationship between executive compensation and corporate social responsibility in a subset of Canadian firms. Following the idea that agents act in their self-interest, Mahoney and Thorne postulate that incentivizing executives to maximize long-term firm performance will result in executives acting in a socially responsible manner. They define corporate social responsibility (CSR) as encompassing considerations made by the firms of its responsibility to investors and consumers, ethical and legal responsibilities, and discretionary responsibility to the community. Executive compensation based on short-term accounting measures, such as annual bonus plans, does not seem conducive for CSR or environmental goals (Mahoney & Thorne, 2005). The authors find a significant

relationship between long-term executive compensation and CSR and an association with environmental actions.

A similar article directly investigated the interrelationship between ESG compensation policy, carbon performance and market value (Haque & Ntim, 2020). In their paper, the authors examine compensation tied directly to carbon emission or ESG goals. Among other things, they find that process-oriented carbon performance is positively associated with market value and that executive compensation positively affects process-oriented carbon (Haque & Ntim, 2020).

CSR and sustainability are important for a firm because they seem to be related to long-term value creation. Lo and Sheu, in their 2007 article, look at the impact of corporate sustainability on firm value. Taking Tobin's q as a proxy for value, they find a significant relationship between corporate sustainability and market value. Furthermore, they also find evidence of an interaction effect between sustainability and sales growth. Finally, they find indications that investors value firms that engaged in sustainable strategies higher. Besides impacting firm value, corporate sustainability has a significant impact on the organizational processes of firms. Eccles, Ioannou and Serafeim (2014) show that firms that adopted sustainable policies in the past have noticeable differences in their organizational processes and structure. Firms that started focusing on sustainability earlier on appear to have executive compensation based on environmental metrics, higher disclosure of information, more stakeholder engagement and most importantly, significantly outperform comparable firms in the long run (Eccles, Ioannou & Serafeim, 2014).

Incentive structures alone are not enough to describe managerial behaviour. Managers often tend to have their unique style that is a product of many factors such as their education and age (Betrand & Schoar, 2003). Bertrand and Schoar (2003) investigated the effect of specific manager characteristics on firm policies and decisions. The authors find that managerial style is highly related to manager fixed effects. Furthermore, they find that a large section of the variation between critical firm decisions can be attributed to specific managerial characteristics. Specifically, they attribute heterogeneity in investments and financial decisions and much of the organizational structure to manager fixed effects.

In a similar manner, Graham, Qiu and Li (2012) attempt to explain variation in executive compensation using CEO- and firm fixed effects. In particular, they find that time-invariant CEO fixed effects account for a large fraction of the variation in compensation. Furthermore, they argue that the inclusion of fixed effects in settings with different firms and executives is critical to avoid omitted variable bias (Graham, Li & Qiu, 2012).

2.2 Hypothesis development

2.2.1 The relationship between long term executive compensation and Environmental, Social and Governance pillar

Wanting to investigate further the connection between compensation based on long term value creation and firms' environmental, sustainability and governance objectives, we aim to contribute to the literature with the following research question: whether there exists a significant and positive relationship between long term executive compensation and a firms' ESG pillars score in U.S firms.

In order to test the above research question, we will investigate the impact of long term compensation on all pillars of the Environmental, Social, Governance (ESG) score. To do this, we established the following hypotheses.

H1.1 First of all, "We postulate that there exists a significant and positive relationship between Environmental score and long term executive compensation". The Environmental score is among others influenced by measures of a firm contribution to deforestation, pollution and climate change.

H1.2 Secondly, "We postulate that there exists a positive and significant relationship between a firms Social score and long term executive compensation". The Social pillar is impacted by a factors such as firms working conditions, its relation to local communities and diversity.

H1.3 Thirdly, "We postulate there exists a significant and positive relationship between Governance score and long term executive compensation". Governance score is related to factors such as board diversity, corruption and lobbying.

H1.4 Finally, to measure the overall effects of each of the pillars the following will be investigated: "I postulate that there exists a significant and positive relationship between a firms overall ESG score and long term executive compensation.

Furthermore, in line with the evidence from Bertrand and Schoar (2003) and Graham, Qiu and Li (2012), we incorporate additional fixed effects to the models aimed at answering hypotheses 1.1 to 1.4. In particular, we extend the research by adding CEO fixed effects and year fixed effects to each iteration. This extension aims to investigate the additional variation in each pillar that can be explained by unobserved characteristics and control for them.

2.2.2 The moderation of Industry on the relation between long term compensation and ESG rating

While most executive compensation consists of similar items across industries, the composition of executive compensation varies a great deal. In different industries, some components of total pay are more prevalent than others. Murphy (1999) illustrates in a graphical analysis that in the Financial Services Industry and the Manufacturing Industry, CEO compensation through stock options represents a much more significant fraction of total compensation than other industries. On the other hand, in the Utilities sector, Salary represents over 40% of total compensation, relative to 27% in the Manufacturing industry and 21% in the Financial Services firms (Murphy, 1999). It is also the case that the degree of long term focused compensation varies per industry.

Anderson, Banker, Ravindran (2000) identify a wide range of economic factors such as moral hazard, Income Taxes, Adverse selection, Debt, size, and other endogenous factors that vary on an industry level that impact the use of options in executive compensation. The authors recognized that in the IT industry, an industry characterized by fast innovation, there was a greater use of stock options. In this study specifically, Anderson et al. research in what manner various economic factors can explain disparities in executive compensation between IT companies and non-IT firms.

As the key issues that make up the ESG scores are heavily industry weighted, differences across industries significantly impact ESG rating. Consequently, it is worthwhile to investigate how industry affects the relationship between long-term compensation and ESG ratings. In order to test this, we include interaction effects between industry and long term compensation to the regressions used for hypotheses stated above. From this follows our second hypothesis.

H2.1: “There exist significant interaction terms between long term compensation and industry on ESG pillars and overall ESG score."

Data

3.1 Sample construction

To test the Hypotheses mentioned above, we have collected firm level data on executive compensation, Environmental, Social, Governance (ESG) ratings and various financial statement items. The universe of our sample follows from the MSCI KLD stats database and consist of the MSCI KLD 400 Social Index and the MSCI USA Index with annual data from 2000 to 2018. As ESG score is used to rate the impact of publicly traded firms, we must investigate firms that have outstanding equity; as such, we have limited the sample to traded companies. Moreover, taking a liquid environment where investors are likely to become aware of CSR decisions is imperative for a market conducive to rewarding firms for lowering emission and tying value creation to social responsibility (Cheung, 2011). Furthermore, by limiting the analysis to companies from one country, country fixed effects are equal for each firm in the sample.

We obtained data on executive compensation from the Compustat ExecuComp database. ExecuComp contains extensive information on employee compensation directly collected from SEC form DEF 14A. The definition of total compensation used in this study follows from the definition described on ExecuComp, the sum of Salary, Bonuses, other annual compensation, Restricted Stock Grants, LTIP, the value of option Grants and finally, all other compensation. In order to measure the firm's degree of long term executive compensation, we have taken a similar approach to that of Mahoney and Thorne (2005). They defined long term compensation as a ratio of stock option grants over total compensation. By creating a ratio of long term focused compensation over total compensation, we obtain an across firm comparable measure. Moreover, as Manner (2010) posed, using the absolute amount of compensation (or long term compensation) can negatively affect CSR as a high CEO pay can signal poor governance and a lack of commitment to other issues. Instead, we use a ratio that defines the composition of the incentive structure.

Contrary to Mahoney and Thorne, we take the sum of Stock awards (including restricted stock), Option grants and Long Term Incentive Plan payouts over total compensation to establish the ratio. Stock awards refer to the value, in thousands of dollars, of any stock-related awards such as restricted stock, phantom stock or common stock. The company itself reports the value of the stock awards per FAS123R. Option grants include any compensation with option-like features. LTIP are based on company performance over a more extended period (at least three years). The analysis was limited to the CEOs of each company.

We obtain data on ESG pillars from the MSCI ESG KLD stats database. MSCI ESG data is a subunit of MSCI, a global provider of support tools and services to institutional investors. The MSCI ESG rating is a score from 0 to 10 and is based on 35 key issues across ten themes heavily weighted to accommodate industry-specific factors. In fact, the key issues are weighted such that for each pillar (Environmental, Socials or Governance), only around 4-7 of the issues determine the rating (MSCI ESG Ratings Methodology, n.d.). The number grade is then converted to a letter grade between CCC and AAA. CCC to B (0.000 - 2.857) is defined as a "laggard", BB to A (2.857 –7.142) as "average", and AA to AAA (7.143 – 10.000) as "Industry leaders" (MSCI ESG Ratings Methodology, n.d.). The Industry weighting is done based on MSCI and S&P's Global Industry Classification Standard (GICS). The ESG ratings provided by MSCI are proprietary information, and as such, the data available through the MSCI ESG KLD database does not contain direct ESG scores. Rather it contains a binary score where "1" indicates that a company meets the assessment requirements for a specific issue and a "0" indicating the contrary. The requirements for "passing" each issue are based on the company's strategy & governance, Initiatives to improve their performance in that particular issue and historical performance. To accommodate for the industry weighting, the dataset only provides the binary indicator for the relevant issues of a particular company. MSCI started using Industry weights in 2010; prior to this, the ESG rating was based on all researched indicators. In order to obtain a usable rating for each ESG pillar, we graded the companies based on how many of the relevant assessments they passed. By taking the ratio of passed issues (indicated by "1") over the total number of assessed criteria and multiplying them by ten we obtain a score between 0 and 10 similar to the MSCI ESG grading scale. Furthermore, to obtain an overall ESG rating, the scores of each pillar are combined and averaged. Since the companies are exclusively assessed on relevant issues, taking the ratio of passed criteria over all relevant criteria accounts for the differences across Industries. Table A.1 contains an overview of all key issues included in our sample for each pillar, subdivided into themes.

To properly investigate the impact of incentivizing executives to maximize long term firm value on ESG pillars, we control for several specific variables. Manner (2010), using a similar sample to ours, identified the CEO characteristics that are the best predictors of CSR. Overall, education, career experience and gender have the most considerable impact on Corporate Social Responsibility. More experience, being female and in particular a degree in humanities, positively affects CSR. We obtain CEO specific information from the ExecuComp Database. However, due to the within estimator of the fixed effects model, we can only control for CEO and firm-specific factors that vary across years, variables that remain constant such as CEO gender and education, will be omitted to avoid collinearity. While we cannot include direct controls for education and gender, we can proxy for career experience using CEO age. Tenure is limited to the time spent at that firm rather than overall career experience.

Moreover, especially for industries with higher CEO turnover, age is a better indicator of career experience. While eternal experience is highly related to high levels of CEO compensation (Bragaw & Misangyi, 2017), the degree of long term compensation can diminish with age. In particular, stock option awards, a significant component of long term compensation, decreases with age (Chourou, Abaoub and Saadi, 2008). Since higher experience is positively associated with CSR and negatively associated with a higher degree of long term compensation, omitting this control could lead to a downwards bias.

In order to control for differences on the firm and industry level, we hold constant financial performance, growth potential and firm capital structure. To model these concepts, we have included several financial indicators and ratios. Using annual data obtained from Compustat Capital IQ, we constructed liquidity ratios, leverage ratios and efficiency ratios, and proxies for firm size. More specifically, using balance sheet data, the following liquidity ratios were created for each company: Current ratio (current assets over current liabilities), Acid-test ratio (current assets less inventories over current liabilities) and Cash ratio (cash and cash equivalents over current liabilities). To examine the amount of capital arising from debt, we created three leverage ratios, Total liabilities over Total assets (Debt ratio), book value of Debt to Equity ratio and total debt over the market value of equity (leverage). Finally, to control for firm efficiency, we created the ratios Return on Assets (ROA) and Return on Equity (ROE). Mahoney and Thorne (2005) utilize total sales as a proxy for firm size; similarly, we use Earnings Before Interest and Taxes (EBIT), total sales and total assets.

While there is limited to no evidence exploring the relationship between liquidity and ESG rating, Boyle and Guthrie (2003) show that the fear of an insufficient fund in the future (low liquidity) can encourage a firm to accelerate its investments. Thus, there can be a negative relationship between liquidity and investments in ESG key issues. With regards to the relationship between leverage and ESG rating, there are conflicting views. Higher leverage can raise a firm's Weighted Average Cost of Capital (WACC), which can deter firms from making certain investments (Baxter, 1967). Following this, it is conceivable that firms with high leverage reject investments into ESG issues favouring opportunities with a higher projected return. Alternatively, Gatchev and Tarhan (2009) show that firms predominately use equity to finance investments with higher asymmetric information and agency costs, such as investments in intangibles. According to this evidence, it is probable that a firm prefers equity over debt to finance ESG projects. However, an alternative explanation as to the association of debt and the ESG pillars is that certain CSR investments have been shown to lower a firm's risk and lower the firms' cost of debt (Magnanelli & Izzo, 2017). This can result in a firm's raising debt to finance environmental projects as it will lower the firm's cost of debt. This explanation aligns with the current explosive trend of green bonds to finance CSR projects (Smith, 2020). As for profitability and

size, the evidence of Lo and Sheu (2007) and Eccles et al. (2014) show that firms with CSR policies (and thus likely higher pillar ratings) are valued higher and have increased Sales. As such, we expect a positive relationship between ESG rating and size proxies and profitability ratios.

Regarding the correlation of the firm level controls with executive compensation, Berkovitch, Israel & Spiegel (2000) predict that leverage and liquidity are positively related to CEO compensation. The implications of an increase in total compensation for long term compensation are highly firm-specific, and thus, we cannot identify any direct association. For both firm size and profitability, there is evidence suggesting a positive association with CEO pay (Zhou, 2000). However, with a fixed compensation structure, primarily short term compensation increases with annual accounting measures (such as EBIT or ROA) (Murphy, 1999), thus, we expect a negative relationship with long term compensation.

We include a binary variable to control whether the firm paid dividends that year (obtained through Compustat Capital IQ). There are two general views on how investment in ESG objectives impact dividend policy (Cheung, Hu & Schwiebert, 2018). ESG investments are value-generating projects and thus generate more cash that can be paid out later as dividends. Alternatively, Through lowering the cost of equity, CSR activities motivate firms to pay out fewer dividends. However, evidence from the U.S. over the last decade suggests that firms with high social responsibility pay more dividends and on a more stable basis (Benlemlih, 2019). Regarding CEO compensation structure, White (1996) shows that any form of dividend incentives for the CEO is positively related to higher levels of dividend payout. Following the evidence of White (1996) and Cheung et al. (2018), controlling for dividends avoids an upwards bias.

Lastly, we have included a variable to control for the percentage of total outstanding shares held by the CEO. We gathered this variable from the ExecuComp Database. Following the idea that investments in ESG are a market value enhancing strategy, there is a positive relationship between ESG rating and ownership, as being a stock owner should compel the CEO to Invest in ESG key issues. Furthermore, As stock awards are a component of long term compensation, there can be disincentives to compensate CEO further with stock when the officer already has significant ownership. Chourou, Abaoub and Saadi (2008) show a negative relation between CEO stock ownership and the determinants of CEO stock option compensation. As such, omitting this variable could lead to a downwards bias.

3.2 Sample description

After removing unusable data, we are left with an unbalanced panel of around 100 companies with data from 2000 to 2018 across nine different industries. The MSCI KLD stats database consists of

several universes, due to the evolution of the coverage universes the bulk of the data is from before 2013. consequently, most of our data is from before 2013.

We divided the companies into industries according to the Standard Industry Classification (SIC) major group classification, indicated by the first two digits of the SIC code. The industries are as follows: Agriculture, Forestry, Fishing (A). Mining (B), Construction (C). Manufacturing (D), Transportation Public Utilities (E). Wholesale Trade (F). Retail Trade (G). Finance, Insurance, Real Estate (H). Services (I). Public Administration (X). However, our sample does not contain any agriculture, forestry, and fishing (A) firms.

To inspect the variables table A.2 reports descriptive statistics. On average, the ESG scores across our sample are quite low, with a means for all pillars and overall ESG score below 1. However, we do see some maximum scores in our sample and quite a bit of variation. The mean CEO age in our sample is 53, which is representative of the average age of CEOs in the United States (Statista, 2020). Furthermore, the CEOs in our sample are predominantly male, with only 3.6% being female. When Investigating the ratio of long term focused compensation over total compensation, we can see that, on average, the Long Term Ratio (LTR) represents around 30% of total compensation. While the maximum total compensation of above 100 million dollars seems unreasonably high, there is no indication that this is due to an error, nor is it necessarily an outlier in our sample. On inspection of the financial ratios, we see lots of variation with a high standard deviation. Furthermore, we see that on average, 81.3% of the companies paid out an annual dividend. Lastly, in general, the degree of CEO share ownership is close to 1%, while the maximum seems fairly high there is no reason to suspect the validity of the observation. While the distribution of ESG pillar scores is somewhat skewed, an alternative specification such as the natural logarithm is not possible as "0" is a valid rating for all pillars of ESG.

When inspecting the correlation (see figure A.1) between the variables, we can see that, except for the governance score, there is a relatively high positive correlation between the ESG pillars. Furthermore, as can be expected, we see strong positive correlations between the liquidity ratios, combined with a high negative correlation between the same ratios and the debt ratio. Interestingly, we can see a negative correlation between the gender dummy (Male) and CEO age, indicating that female CEOs in our sample are generally younger than the males. However, neither age nor gender seems to impact ESG scores. Rather unexpectedly since both these characteristics have been previously identified as have a strong relation with CSR (Manner, 2010). Beyond these result there is no particularly relevant correlation between the other variables.

Figure A.2 to A.5 illustrates, through a box plot, the variation in each ESG pillar score across the industries in our sample. ESG pillar scores are weighted on industry-specific factors; thus, figures A.2, to A.5 can only be used to inspect the variation in ESG ratings across our sample rather than to make

any meaningful comparison between industries. The figures show that while the mean scores for the Environmental, Social, Governance and total ESG scores are relatively low, there is much heterogeneity within the ratings. From figure A.4 we see that the Governance score has the least variation; this is expected since the governance score calculation is based on far fewer key issues relative to the environmental and social pillars.

Figure A.6 illustrates, in percentages, the variation between the relative importance of the components of total compensation. Other compensation encompasses all CEO pay that we have not deemed to be long term incentives, Salary, Bonuses, other annual compensation and all other compensation. The fractions represent the mean over our entire sample. As expected, it is apparent that the components of executive compensation vary drastically per industry. While the use of options seems relatively comparable, there is a large discrepancy between stock options and LTIP. Similar to the evidence provided by Murphy (1999), we see that in the utilities sector (E), Other compensation such as Salary represents the most considerable fraction of total compensation. Moreover, we see that the use of long term compensation is comparatively low for the Services industry (I), where other compensation represents close to 80% of total compensation, and for Retail trade (G). Even though unlike many others, executive compensation in Retail trade (G) contains an element of LTIP, long term focused components only represent around 20% of total CEO compensation. Overall, in our sample, only the Manufacturing industry (D), Retail Trade (G), Finance Insurance and Real Estate (H) and Public administration contain LTIP. The mining industry (B) has the most significant fraction of long term compensation.

Methodology

We employ a panel data design for this study in order to incorporate both time-series and cross-sectional dimensions. A fixed effects specification allows us to control for unobserved omitted variables that are unique across firms but remain constant over time. We utilize a fixed effects estimator to remove any unobserved heterogeneity and thus ensure that the weak exogeneity assumption holds. Furthermore, as the underlying thought of the hypotheses are that there are industry-specific factors, the degree of long term compensation, that will impact the dependent variable (ESG pillars), it logically follows that a fixed-effects model with industry fixed effects should be used over a random-effects or a seemingly unrelated regression (SUR). However, to verify this assumption, we conduct a Hausman test.

Under the null of the Hausman test, the differences in coefficients are not systematic, and it follows that a Random effects model is more appropriate. However, both the Fixed effects estimators and the Random effects estimator are consistent (Chris Brooks, 2020). If the null can be rejected, only the fixed effects model is consistent. Furthermore, to control for serial correlation, we cluster the standard errors on the firm level for all specifications.

To avoid over-controlling, the most relevant variable of each group (liquidity, leverage, profitability and size) have been determined based on significance and the absolute increase in adjusted R-squared. We then add these control variables to a fully restricted model. We will also establish a model using all controls to avoid a potential bias caused by other omitted variables. Through the change in the adjusted R-squared, we can make inferences as to the added explanatory power of these extra controls.

4.1 Exploring the effect of Long Term Ratio on ESG pillars

In order to test the effect of long term of focused compensation on individual ESG scores, we consider four iterations of equation 4.1, where ESG_pillar will be substituted with Environmental score, Social score, Governance score and overall ESG rating and where LTR represents the Long Term Ratio.

$$ESG\_Pillar_{it} = \beta_0 + \beta_1 LTR_{it} + \beta_2 Age_{it} + \beta_3 CEO\_ownership + \beta_4 Curr\_ratio_{it} + \beta_5 Leverage_{it} + \beta_6 ROE_{it} + \beta_7 Div_{it} + \beta_8 Sales_{it} + IndustryFE + \epsilon_{it} \quad (4.1)$$

In addition, to control for unobserved fixed effects on the CEO and yearly level, we introduce fixed effects terms to the same regressions, and the four versions are repeated (see equation 4.2).

$$ESG\_Pillar_{it} = \beta_0 + \beta_1 LTR_{it} + \beta_2 Age_{it} + \beta_3 CEO\_ownership + \beta_4 Curr\_ratio_{it} + \beta_5 Leverage_{it} + \beta_6 ROE_{it} + \beta_7 Div_{it} + \beta_8 Sales_{it} + IndustryFE + CEOFE + YearFE + \epsilon_{it} \quad (4.2)$$

Furthermore, to observe the explained variation in the dependant variable due to Industry fixed effects, we pose an additional regression with no variables (See equation 4.3).

$$ESG\_Pillar_{it} = \beta_0 + IndustryFE + \epsilon_{it} \quad (4.3)$$

equation 4.4 will subsequently be utilized to evaluate the additional explained variation as a result of adding CEO fixed effects and Year fixed effects to the model.

$$ESG\_Pillar_{it} = \beta_0 + IndustryFE + CEOFE + YearFE + \epsilon_{it} \quad (4.4)$$

An issue that arises when including multiple fixed effects is that groups with only one observation (singletons) can inflate the significance and, as such, lead to invalid interpretations (Correia, 2015). Therefore, we drop the singleton groups for the regressions with additional fixed effects.

We evaluate the proportion of the variation in the dependent variable that the model can explain through the coefficient of determination (R-squared). The R-squared takes the ratio of the variation explained by the estimation model over the total variation in the sample (Chris Brooks, 2019). Since the R-squared can be artificially inflated by over-controlling, the adjusted R-squared, which accounts for the number of variables in the model, will also be employed. By comparing the increase in R-squared and adjusted Rsquared due to additional fixed effects relative to the same regression without the extra terms, we can infer how much additional variation is explained by the fixed effect terms.

To answer Hypothesis 1.1 to 1.3 the following null hypotheses with a two sided alternative hypothesis is posed for all individual pillars and ESG rating:

H0: the coefficient of Long Term Ratio is equal to zero.

Ha: the coefficient of Long Term Ratio is not equal to zero.

4.2 Heterogeneity analysis of the effect of long term compensation on ESG pillars across industries

When investigating our second hypothesis on the interaction between industry and long term compensation, we aim to model how industry moderates the effect of long term compensation on ESG pillars. In order to achieve this, we have included interaction terms between all nine industries and the level of long term compensation while controlling for the aforementioned firm- and CEO characteristics. The interaction term between industry and long term compensation will allow the effect of long term compensation on our dependent variables to depend on the firm's industry. Thus, through the interacted regressor, we can infer whether industry affects the relationship between long term compensation and ESG pillars. We have established the following equation (equation 4.5) to investigate this relationship. Where again, ESG_pillar represents each component of ESG score and overall ESG score. We hold back the Mining Industry (B) to avoid perfect collinearity.

$$\begin{aligned} ESG\_Pillar_{it} = \beta_0 + \beta_1 LTR_{it} + \beta_2 (LTR * Industry) + \beta_3 Age_{it} + \beta_4 CEO\_ownership + \\ \beta_5 Curr\_ratio_{it} + \beta_6 Leverage_{it} \\ + \beta_7 ROE_{it} + \beta_8 Div_{it} + \beta_9 Sales_{it} + IndustryFE + \epsilon_{it} \end{aligned} \quad (4.5)$$

To control for differences across firms, the same controls as for hypothesis one have been used. As before, two versions of each model will be estimated, with and without additional controls for unobserved fixed effects (see equation 4.6).

$$\begin{aligned} ESG\_Pillar_{it} = \beta_0 + \beta_1 LTR_{it} + \beta_2 (LTR * Industry) + \beta_3 Age_{it} + \beta_4 CEO\_ownership + \\ \beta_5 Curr\_ratio_{it} + \beta_6 Leverage_{it} + \beta_7 ROE_{it} + \beta_8 Div_{it} + \\ \beta_9 Sales_{it} + IndustryFE + CEOFE + YearFE + \epsilon_{it} \end{aligned} \quad (4.6)$$

To provide a rejection criteria for hypothesis 2.1 the following Null hypothesis with a two sided counterpart is posed for all individual pillars and ESG rating:

H0: the coefficient of the interaction term between Industry and long term ratio is equal to zero.

Ha: the coefficient of the interaction term between Industry and long term ratio is not equal to zero

Results

5.1 Hausman test

Table A.3 depicts the results of a Hausman test of a Random effects estimator versus a Fixed effects estimator. As we can see from the last column, we can reject the probability of obtaining the chi-square statistic given that the null hypothesis is true at the 1% significance level for all pillars. Therefore, as expected, we can infer that for the Environmental score, the Social score, Governance score and overall ESG rating, a fixed effects estimator must be used.

5.2 The relationship between long term compensation and ESG

Table A.4 presents the results of the regressions conducted to answer Hypothesis 1.1 to 1.4.

First, to speak on the relationship between the ratio of long term compensation over total compensation and the Environmental pillar (ENV), we estimate the regression of Environmental score on just Long Term Ratio (LTR) with no additional controls (see column I). We find a significant and positive relationship between LTR and Environmental score of a magnitude of 1.258 at the 1% significance level. This result would indicate an increase in the LTR of 1% point would increase the Environmental pillar score by 0.0126. Furthermore, regression I has an R-squared of 16.5%. In column II, we add the various controls in accordance with the methodology described above. We can see a slight decrease in the significance of the relationship between LTR and Environmental score from 1% to the 5% level, as well as a decrease in the magnitude of the effect. Besides Long Term Ratio, we see significant coefficients for Current ratio, Leverage, ROE and Sales. The liquidity measure (Current Ratio) has a highly significant yet negative coefficient, in line with the expectation of Boyle and Guthrie (2003) that low liquidity accelerates investments. Moreover, we can interpret the negative coefficient of leverage as caused by an increase in the firms' WACC. Alternatively, this can result from a firm's preference for financing uncertain projects with equity, as found by Gatchev and Tarhan (2009). lastly, we see a positive relationship for both ROE and Sales. This association is consistent with the evidence found by Lo and Sheu (2007) and Eccles et al. (2014). Due to the inclusion of control variables, the explained variance, as measured by the R-squared, has increased significantly to 25.9%. We see a similar increase in the adjusted R-squared. In the third iteration of the regression of LTR on the Environmental score, we add all remaining controls (column III). The addition of the other controls appears to have benefited the regression only slightly as there is around a 1% increase in the adjusted R-squared. The coefficient

of LTR has remained similar, and there are no changes in the significance. While Current ratio has lost its significance, the interpretation of the other variables remains the same. Furthermore, we observe a small (at the 10% level) positive and significant relationship between the book value of debt over stockholders' equity and the Environmental pillar. This is conflicting with the evidence shown by the leverage coefficient. In the fourth version of the regression on the Environmental pillar, we explore the explained variation by industry fixed effects by themselves. We observed through our coefficients of determination that industry fixed effects can account for roughly 10% of the variation in this pillar.

Secondly, we investigated the impact of LTR on the Social pillar (SOCIAL) through regressions V to VII. Again, we find a positive and significant relationship at the 1% level. Regression V indicates that an increase in LTR of 1% point leads to an increase in Social score of 0.0105. Furthermore, we observe an R-squared of about 15%. Controls were added to regression V and VI in the same manner as they were for the Environmental score. In both regression V and VI, we see that the LTR coefficient remains highly significant. Similar to the Environmental pillar, we observe a reduction in the coefficient of Long Term Ratio from above 1 to around 0.750 due to additional controls. Akin to what we observed for the first pillar, there are significant coefficients for Current ratio and sales. However, both ROE and leverage provide different interpretations. While ROE is not significant in the regression on Social score, the negative coefficient is not in line with the literature previously discussed. Also, in regressions VI and VII, we see that the coefficients for both leverage and total debt over total assets (Debt ratio) are positive, providing further evidence for the idea by Magnanelli & Izzo (2017) that a firm that invests in CSR, can increase their debt outstanding due to a lower cost of debt which in turn will lead to higher pillar ratings. We observe that due to the initial addition of controls, both the R-squared and adjusted R-squared double, with a further increase when including all controls. From the evidence provided in column VIII, we see that industry fixed effects explain around 7% of the variation in Social rating.

Thirdly, we repeat the same regression for the Governance pillar (GOV) rating in columns XI to XII. Unlike the first two pillars, even without any controls, we did not find any significance in the relationship between Governance and LTR. Moreover, contrary to what the literature suggests, we see a significant and negative relationship between Governance score and ROE and Debt over Equity. Again, the impact of debt on ESG ratings of firms is unclear, and evidence such as that provided by Magnanelli and Izzo (2017) and Gatchev and Tarhan (2009) are conflicting. As to the explained variation, it follows a trend much like the other two pillars. The inclusion of controls increases both coefficients of determinations significantly, while the expansion in column XI only provides a small additional benefit to the model. Column XII shows us that by itself, industry fixed effect can explain 7.4% of the variation in Governance score (as measured by the R-squared).

Lastly, we conduct the regression once more to investigate the relationship with overall ESG rating (see column XIII to XVI). We observe a significant (at 1% level) coefficient for Long Term Ratio in all iterations of the model. Following from this result we can infer that an increase in LTR of 1% point increases the total ESG rating by 0.0097 (according to column XIII). Furthermore, we see similar results in the coefficients as for the individual pillars. While most controls are not significant at any level, there are significant coefficients for ROE and sales in column XIV. Column XV presents significant and positive coefficients for both debt ratio and debt over equity, in line with the positive association between debt and ESG rating as proposed from the concepts of Magnanelli & Izzo (2017). finally, column XVI investigates the explained variation solely due to industry fixed effects. The evidence from the R-squared suggests that industry fixed effects by itself explains around 8% of the variation.

Table A.5 repeats all regression in table A.4 with the addition of including CEO fixed effect and year fixed effects. We observe a dramatic difference in the significance of the variable of interest (LTR); namely, the coefficient is not significant in all iterations and for all pillars. The most important difference is in the additional explained variation as measured by the coefficients of determination. This is in particular, most relevant in the case of the fourth regression for each pillar. In comparison to the results of the previous table, the inclusion of CEO- and year fixed effect increases the explained variation in the Environmental pillar from 10% to around 60%. For Social score, column VIII shows an increase of more than 61% in the R-squared compared to table A.4. Furthermore, we record a lower increase of around 38% for the Governance pillar. Lastly, for ESG rating, we see an increase in R-squared of 62.3% following the addition of CEO- and year fixed effects. .

5.3 The interaction between Industry and Long Term Ratio

The second hypothesis pertains to the interaction effects between Industry and LTR. To investigate this relationship we present, the results of regressions 3 and 4 in table A.6. Furthermore, to provide a graphical illustration, interaction plots are presented in figures A.7 through A.10. In the interaction plot, we can infer by the slopes of the lines through the mean scores whether there are interaction effects present.

In figure A.7 the interaction plot for Environmental rating is presented. For Industries B (mining), C (Construction) and E(Transportation & Public Utilities), there are very distinct slopes, indicate the presence of interaction effects. However, for the remaining industries, the fitted lines through the mean scores appear relatively parallel to each other, refuting the notion of significant interaction effects. We see similar results for all figures. While there seem to be some interaction effects present for selected industries, for most, especially industries G (Retail Trade), H (Finance, Insurance, Real Estate), I (Services) and X (Public Administration), it is hard to discern any appreciable discrepancies

between the slopes.

In table A.6 the results of the regressions with interaction terms are presented. For each ESG pillar, the first column presents the regression without additional fixed effects. Furthermore, to avoid perfect multicollinearity, industry B (Mining) is left out. First of all, in columns I and II, we can observe that for the Environmental scores, all the interaction terms between LTR and the various industries are significant, at least at the 5% level. We can also see that the effect of LTR on ENV without the moderation of industry is negative and significant (at the 5% level). The results from column I can be interpreted as an increase in LTR of 1% point increases Environmental pillar score by 0.039 provided the firm is in industry C (Construction); this coefficient follows from the combination of the standalone effect of LTR and the interaction with industry C. furthermore, besides the significant interaction terms we observe significant coefficients for Current ratio, leverage and sales. The direction of the coefficients is in line with what we posed following the evidence from Gatchev and Tarhan (2009), Lo and Sheu (2007) and Eccles et al. (2014).

In column II, we can see that due to the inclusion of CEO- and year fixed effects, the magnitude of the interaction terms increased, along with a decrease in significance for some industries. As a result of the auxiliary fixed effects, both the R-squared and adjusted R-squared have more than doubled, consistent with what we observed for the previous hypothesis.

Secondly, a sharp contrast to the outcomes mentioned above is the regression results on the Social pillar. While there remains some significance in the control variables, most notably total sales at the 1% level, columns III and IV show that none of the Interaction terms are significant at any level. The significant but negative coefficient in column IV provides a conflicting interpretation with the previous pillar and literature. Similar to what we saw in column II, the addition of the other fixed effects increases the magnitude of the coefficients by a considerable amount and almost doubles the model's explained variation as measured by the R-squared and adjusted R-squared.

Thirdly, more analogous to the results found for the Environmental score, the interaction term between industry and Long Term Ratio on Governance score and the standalone value of LTR is highly significant at the 1% level, with the only exception being Industry C. In contrast to the previous terms, the coefficients are negative. However, the standalone value of LTR is highly significant and positive. These results would indicate that for a firm in Industry C (Construction), an increase in long term executive compensation of 1% point would increase Governance rating by 0.091. As for the other variables, the only significant coefficients are ROE, sales and leverage (in the iteration with CEO- and year fixed effects). Similar to column IV, ROE provides a contrasting result to what we would expect from previous studies. Again, akin to what we saw for the other pillars, the addition of CEO- and year fixed effects increases the coefficients of determination by over 100%. However, for the Governance

pillar, the inclusion of the other fixed effects has removed all significance from the interaction terms.

Lastly, when we investigate the nature of the interaction terms for overall ESG rating, we see that there is no significance at any level for the interaction terms or Long Term Ratio by itself. According to the R-squared, the addition of further fixed effects has increased the explained variation in ESG score from 33.2% to 74.9%. We note a similar increase for the Adjusted R-squared.

Conclusion

6.1 On the relationship between LTR and ESG rating

In the fully restricted model and in the models with appropriate controls, we see a clear and significant relationship between the Long Term Ratio and the ESG pillars, with the exception of Governance scores. The results presented above in section 5.2 illustrate that for the Environmental pillar, Social pillar and ESG rating, there is a positive relationship, as posed by the hypotheses, even when controlling for differences on the CEO- and firm-level. Therefore, in light of the evidence provided by the results of the regression presented in table A.4 and A.5 we are can reject the null that there is no effect of LTR on the Environmental pillar, Social pillar and overall ESG rating. However, we cannot reject the null of no effect for the Governance pillar. Following our results, we can say that in our sample, we have found evidence that there is a direct and significant relationship between Long Term Ratio and two-out-of-three ESG pillars and total ESG rating. An important implication of this result is that it appears that incentivizing officers to create long term firm value leads them to invest in issues that also benefit external stakeholders rather than just equity holders.

Following the addition of CEO fixed effects and year fixed effects, we can see that the explained variation, as measured by the (adjusted) R-squared, increases significantly for all pillars and adaptations of the model. The result presented, in particular by the iteration without variables, illustrates that, in accordance with evidence found in previous studies, unobserved managerial and annual characteristics can explain a significant amount of variation in ESG pillars and overall rating. In fact, they capture so much of the variation that there is no significance left in the coefficient of LTR.

6.2 The influence of industry on the relation between LTR and ESG

The evidence found surrounding the second hypothesis is somewhat conflicting. The results suggest that there are significant interaction effects between industry and Long Term Ratio only for some pillars. Even though there is some evidence of interaction effects on inspection of the interaction plots, it is hard to infer the nature of the interaction. We find significant interaction terms for the Environmental pillar and the Governance pillar on closer evaluation of the regression results. According to these results, we cannot reject the null of no effect for the Social pillar or ESG rating. However, we can reject the null for the Environmental pillar and the Governance pillar. Thus, overall the findings are inconclusive, and without further investigation, we cannot speak on the prevalence of interaction

effects between industry and LTR on ESG ratings.

The inclusion of further fixed effects does not severely alter the conclusion that follows from the results. Similar to what we observed for hypothesis one, CEO- and annual fixed effects capture a significant amount of the explained variation in ESG pillar ratings.

6.3 Limitations

There are a number of significant limitations that put an asterisk next to the results found in this paper. Most importantly, the applicability of the ESG data for this study. There are some issues concerning the data taken from the MSCI KLS stats database. Primarily, since we do not have direct access to the actual ESG ratings as used by the agency, it is hard to infer the accuracy of the scores used in this study. While we were able to construct scores for each pillar using a very similar methodology to MSCI, there will undoubtedly be discrepancies between the ratings. As we were limited to a binary dataset (pass or fail), our method of ascertaining the pillar ratings has likely led to a lower variation in the scores. In particular, the low variation of the governance score could have contributed to the insignificant results.

Secondly, ESG ratings are heavily industry weighted based on the Global Industry Classification Standard (GICS), while the companies in this study were classified based on Standard Industry Classification (SIC) codes, and there is no conversion between the two methods. Due to this, in our sample, firms classified into the same industry as indicated by their SIC code have ESG ratings weighted on different issues and vice versa. While the implications of this for the interpretations of the results are not directly apparent, it is worth mentioning that potential bias might arise.

Another limitation that arises from the data employed in this study is the limited sample size. The panel used is unbalanced, and there was no complete data for the entire period of interest for a considerable number of firms. A larger, more complete sample will undoubtedly provide more conclusive results.

6.4 Recommendations

An alternative approach to estimating some of the regressions could provide more conclusive results and increase explanatory power. In particular, utilizing a specification that can accommodate multiple fixed effects better, such as the Abowd, Kramrz and Margolis (1999) (AKM) model used by Graham, Qiu and Li (2012) and Davidson et al. (2019) to incorporate both executive- and firm fixed effects separately. While initially designed to study wage inequality in French workers, the AKM model has had success in its application in financial studies. By employing panel data with executives that have

moved to different firms and CEOs that have not but are in companies where somebody works that have moved, the AKM model can separately determine the power of Firm- and CEO fixed effects in explaining variation (Davidson et al., 2019). The use of this model has several important implications in studies that aim to capture CEO and company-specific effects (Graham, Qiu Li, 2012). In the context of our study, the AKM model can provide more direct results as the variation in ESG scores that can be explained by the additional fixed effects individually.

A further recommendation is to examine the relationship between long run executive compensation and ESG pillars in a panel of European firms. While currently, the prevalence of ESG data is still behind that of the United States, in a recent study, they find that European executives are ahead of the rest of the world with regards to the availability of Environmental, Social and Governance products (Kurtosys, 2020) and assets under management (Global Sustainable Investment Alliance, 2018). It could be beneficial to investigate the role of executive compensation in this setting.

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Appendix

Table A.1

Overview of Key ESG issues.

Pillars	Themes	Key issues				
Environmental	Climate Change	Financing Environmental Impact	Product Carbon Footprint	Climate Change Vulnerability	Regulatory Problems	
	Natural Capital	Water Stress	Biodiversity	Land Use	Raw Material Sourcing	Water Management
	Pollution	Waste	Ozone Depleting Chemicals	Electronic Waste	Non Carbon Releases	Clean Energy
		Pollution Prevention	Recycling			
	Environmental Opportunities	Opportunities in Green Building	Opportunities in Renewable Energy	Beneficial Products and Services	Supply Chain Management	
	Other	Other Strengths	Other Concerns			
Social	Human Capital	Labor Management	Health and Safety Concern	Human Capital Development	Child Labor	
		Women and Minority Contracting	Employee Involvement			
	Product Liability	Product Safety	Health and Safety Strength			
	Stakeholder Opposition	Antitrust	Transparency Strength	Union Relations	Tax Disputes	
		Investment Controversies	Controversies	Human Rights Violations		
	Social Opportunities	Freedom of Expression	Censorship	Support for Education	Access to Finance	Access to Communications
		Benefits to Economically Disadvantaged	Charitable Giving	Negative Economic Impact	Support for Housing	
	Other	Community Other Concerns	Burma Concern	Other Strengths	Emp. Relations Other Concerns	
Governance	Corporate Governance	Ownership Strength	Limited Compensation			
	Corporate behavior	Controversial Investments	Business Ethics	Public Policy Strength	Political Accountability Strength	
	Other	Corp. Gov Other Concerns				

Note. Overview of all key ESG issues on which the companies in the sample could be assessed. Modeled after the MSCI ESG Key issue Hierarchy

Table A.2

Variable descriptive statistics.

Variables	Observations	Mean	Median	St.Dev	min.	max.
ENV SCORE	798.000	0.679	0.000	1.356	0.000	10.000
SOCIAL SCORE	798.000	0.822	0.476	1.044	0.000	6.250
GOV SCORE	798.000	0.546	0.000	1.324	0.000	10.000
ESG SCORE	798.000	0.756	0.333	0.965	0.000	6.957
Age	717.000	52.894	52.000	7.161	31.000	79.000
Male	798.000	0.964	1.000	0.187	0.000	1.000
Total comp A	783.000	6048.501	3317.399	8570.601	0.000	107000
LT comp	1833.000	1018.625	0.000	2856.376	0.000	40110.700
LTR	764.000	0.319	0.305	0.277	0.000	0.997
Curr ratio	1325.000	2.123	1.728	1.578	0.264	19.227
Acid test	1325.000	1.543	1.211	1.435	0.140	18.453
Cash ratio	1320.000	0.550	0.289	0.834	0.000	11.159
Debt ratio	1824.000	0.639	0.626	0.221	0.062	1.669
Debt equity	1824.000	3.036	1.607	20.869	-755.577	221.066
Leverage	1400.000	0.441	0.194	1.131	0.000	24.23
ROA	1825.000	0.050	0.046	0.070	-1.009	0.500
ROE	1825.000	0.146	0.130	1.447	-28.368	36.967
Div	1833.000	0.813	1.000	0.390	0.000	1.000
EBIT	1823.000	1783.753	489.774	4410.699	-6725.190	60383
Sales	1825.000	12885.830	4573.998	22512.69	63.447	230859
AssetsTotal	1825.000	44472.820	7603.300	130000	79.873	1120645
CEO ownership	1833.000	0.901	0.000	4.728	0.000	69.100

Note. Descriptive statistics of variables utilized throughout the models. Total comp and LT comp presented in thousands of dollars. All numbers rounded to 3 decimals.

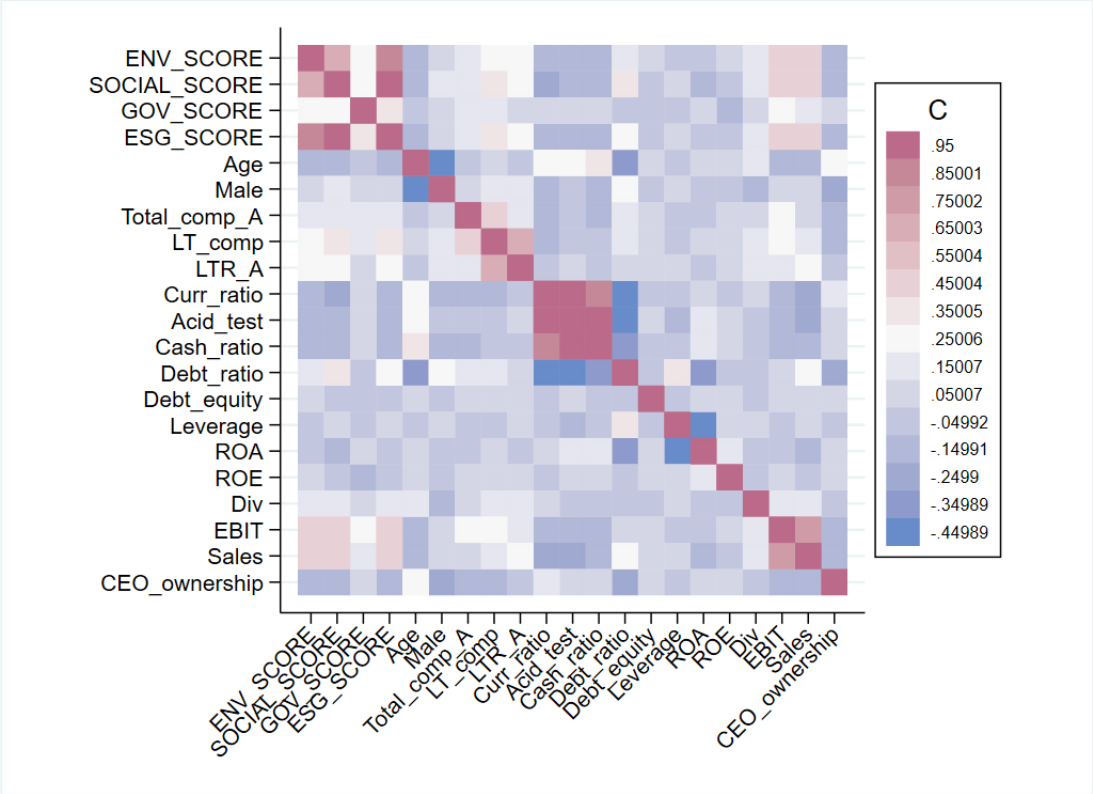

Figure A.1. Correlation between variables

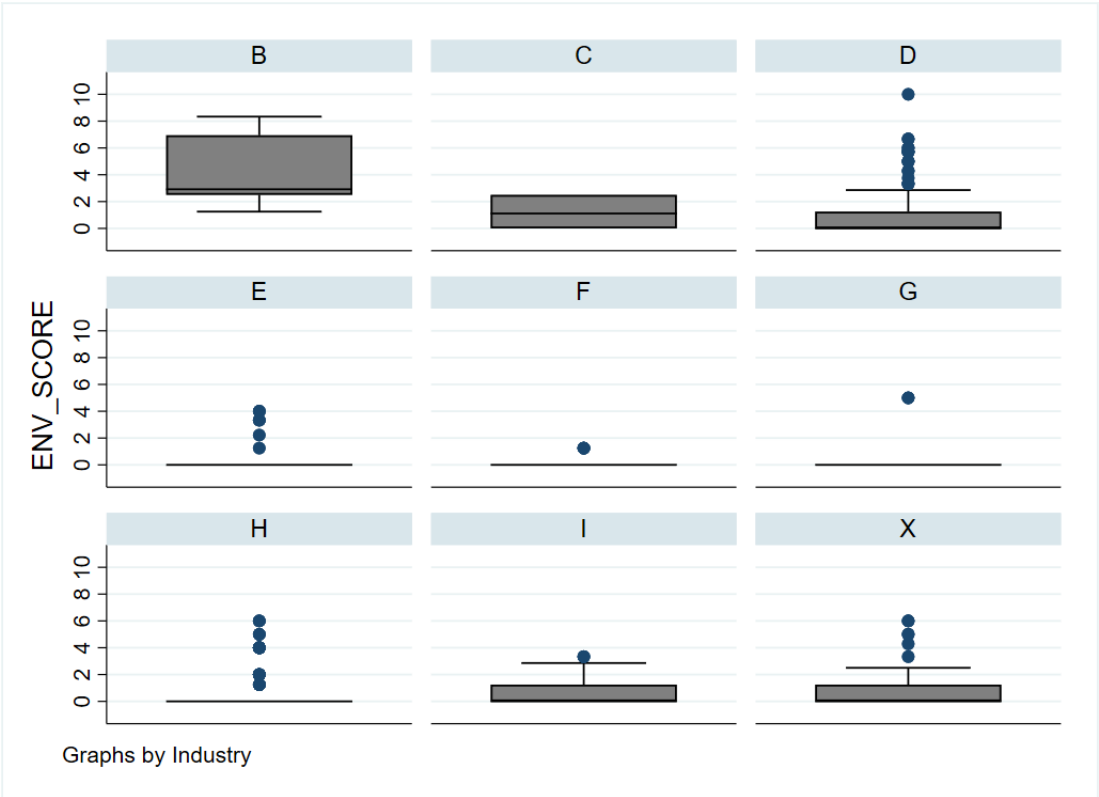

Figure A.2. Box-plot of Environmental pillar score across industries

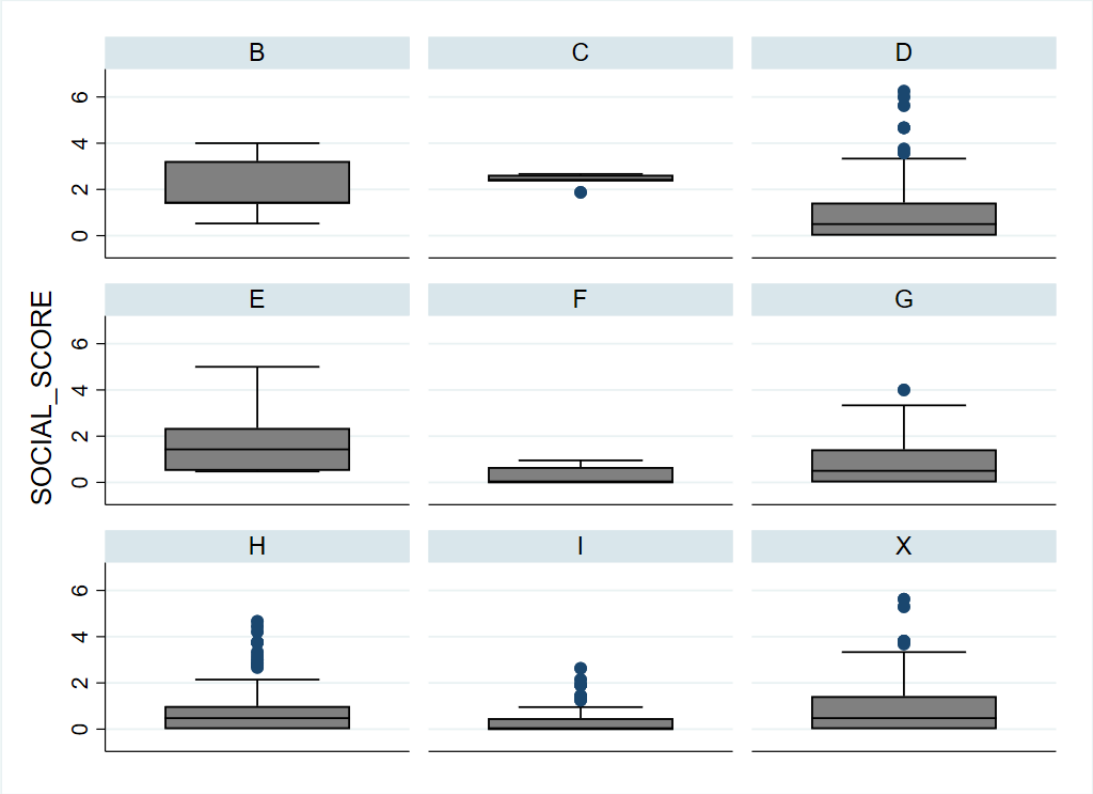

Figure A.3. Box-plot of Social pillar score across industries

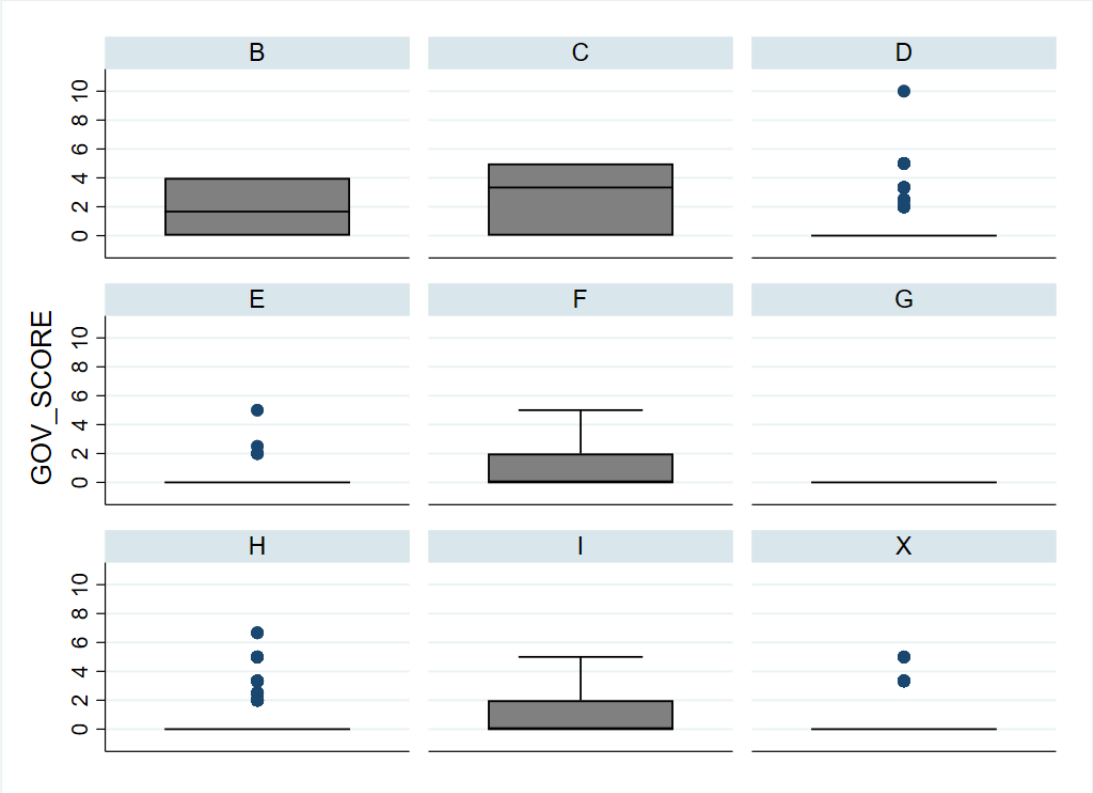

Figure A.4. Box-plot of Governance pillar score across industries

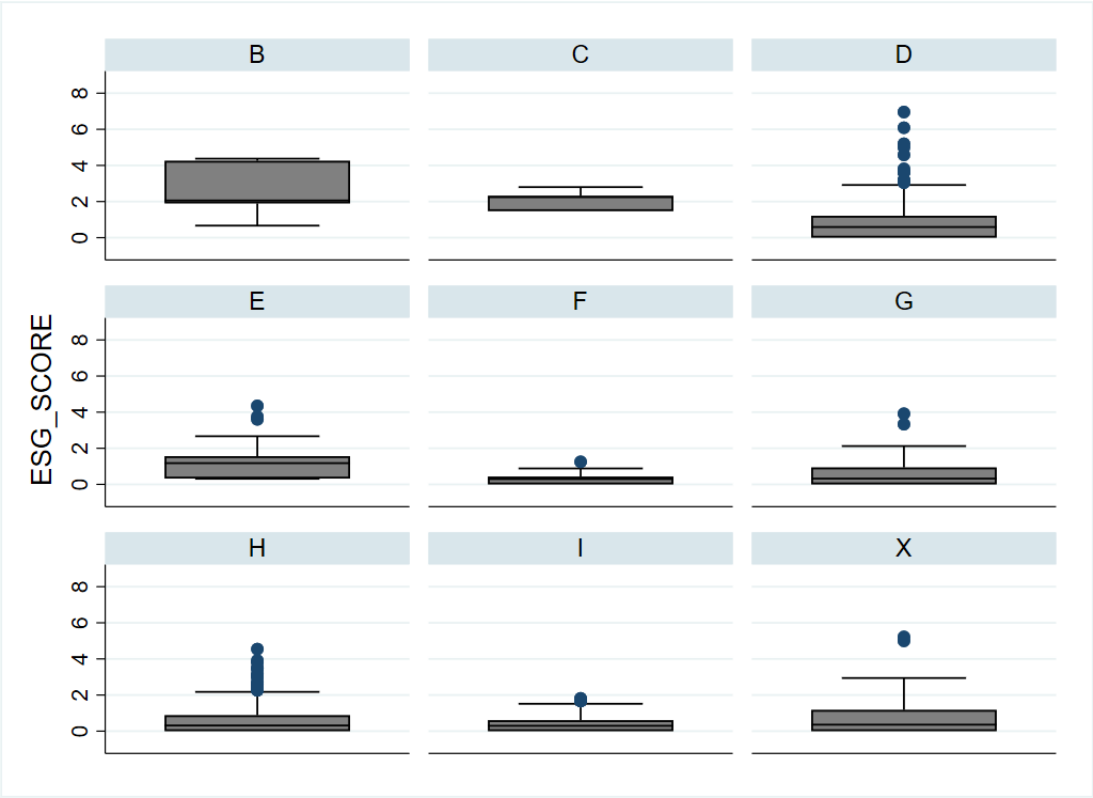

Figure A.5. Box-plot of ESG score across industries

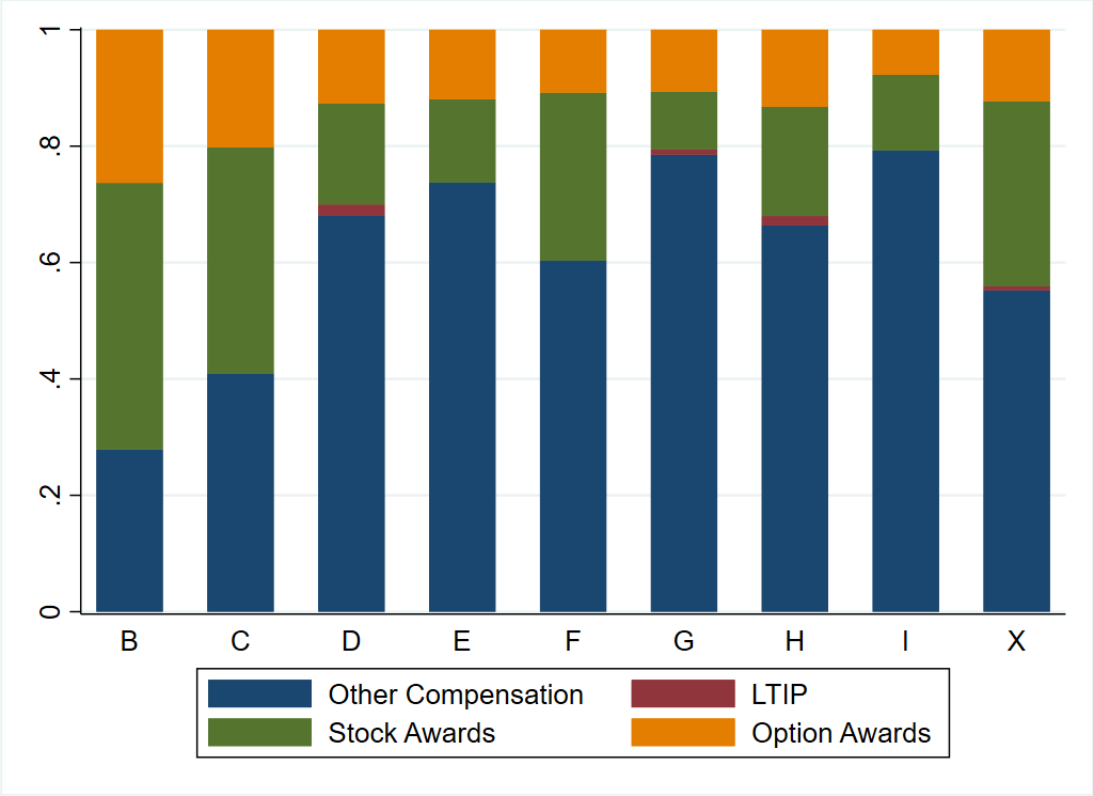

Figure A.6. Components of total compensation across industries

Table A.3

Hausman test

Variable	FE (b)	RE (B)	Difference (b-B)	Sqrt(diag($v_b - v_B$))	Prob>chi2
Environmental	1.258	1.000	0.257	0.055	0.000
Social	1.054	0.808	0.246	0.078	0.002
Governance	-0.061	0.128	-0.187	0.060	0.002
ESG	0.974	0.764	0.210	0.072	0.003

Note. FE corresponds to Fixed effects whereas RE stands for Random effects.

Table A.4

Main regression results.

Variable	ENV				SOCIAL				GOV				ESG			
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
LTR	1.258***	0.757**	0.723**		1.054***	0.769***	0.744***		-0.061	0.082	0.072		0.974***	0.692***	0.665***	
	(0.234)	(0.256)	(0.252)		(0.219)	(0.220)	(0.216)		(0.274)	(0.300)	(0.286)		(0.194)	(0.197)	(0.190)	
Age		-0.006	-0.003			-0.013	-0.004			-0.002	0.001			-0.010	-0.004	
		(0.009)	(0.010)			(0.009)	(0.009)			(0.010)	(0.011)			(0.008)	(0.008)	
CEO_ownership		-0.006	-0.004			-0.003	0.001			0.010	0.011			-0.002	0.002	
		(0.006)	(0.005)			(0.006)	(0.005)			(0.010)	(0.009)			(0.005)	(0.005)	
Curr_ratio		-0.094***	-0.115			-0.058*	0.086			0.058	0.073			-0.055	0.029	
		(0.024)	(0.117)			(0.035)	(0.156)			(0.058)	(0.145)			(0.029)	(0.125)	
Leverage		-0.067**	-0.080**			0.034*	-0.020			-0.014	0.028			0.002*	-0.030	
		(0.029)	(0.035)			(0.020)	(0.029)			(0.016)	(0.042)			(0.018)	(0.025)	
ROE		0.024*	0.025**			-0.016	-0.006			-0.110***	-0.120***			-0.015	-0.010	
		(0.013)	(0.012)			(0.011)	(0.010)			(0.010)	(0.015)			(0.010)	(0.009)	
Div		0.270	0.280			0.206	0.155			-0.050	-0.079			0.192	0.159	
		(0.179)	(0.182)			(0.151)	(0.133)			(0.173)	(0.178)			(0.134)	(0.124)	
Sales		0.000***	0.000*			0.000***	0.000			0.000*	0.000			0.000***	0.000	
		(0.000)	(0.000)			(0.0000)	(0.000)			(0.000)	(0.000)			(0.000)	(0.000)	
Acid_test			0.084				-0.004				0.014				0.027	
			(0.128)				(0.157)				(0.196)				(0.133)	
Cash_ratio			-0.079				-0.158				-0.045				-0.131	
			(0.121)				(0.111)				(0.175)				(0.108)	
Debt_ratio			0.319				1.349**				0.183				0.954**	
			(0.422)				(0.393)				(0.559)				(0.334)	
ROA			-0.225				0.262				1.415				0.272	
			(0.976)				(0.865)				(0.850)				(0.000)	
EBIT			0.000				0.000*				0.000				0.804	
			(0.000)				(0.000)				(0.000)				(0.000)	
AssetsTotal			0.000				0.000				0.000				0.000	
			(0.000)				(0.000)				(0.000)				(0.000)	
Debt_equity			0.001*				0.000				-0.002***				0.000*	
			(0.000)				(0.000)				(0.000)				(0.000)	
constant	0.283***	0.732	0.300	0.679***	0.488***	1.114**	-0.302	0.822***	0.568***	0.384	-0.078	0.546***	0.449	0.961**	-0.099	0.756***
	(0.065)	(0.482)	(0.657)	(0.075)	(0.076)	(0.451)	(0.624)	(0.080)	(0.105)	(0.552)	(0.757)	(0.072)	(0.061)	(0.395)	(0.547)	(0.068)
Industry FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
obs	764.000	469.000	469.000	798.000	764.000	469.000	469.000	798.000	764.000	469.000	469.000	798.000	764.000	469.000	469.000	798.000
R2	0.165	0.259	0.280	0.100	0.152	0.330	0.388	0.074	0.055	0.106	0.167	0.058	0.156	0.312	0.364	0.081
R2_a	0.155	0.233	0.243	0.091	0.141	0.306	0.357	0.065	0.044	0.074	0.123	0.049	0.146	0.287	0.331	0.072

*Note.*Regression of Long Term Ratio (LTR) on each ESG pillar. *p<0.1, **p<0.05, ***P<0.01.

Table A.5

Regression results including CEO and Year fixed effects.

Variable	ENV				SOCIAL				GOV				ESG			
	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
LTR	0.035	-0.354	-0.315		0.263	0.234	0.273		0.131	0.249	0.244		0.174	0.078	0.116	
	(0.258)	(0.335)	(0.333)		(0.161)	(0.216)	(0.22)		(0.327)	(0.396)	(0.409)		(0.153)	(0.209)	(0.211)	
Age		0.174	0.104			0.129	0.134			0.185	0.283			0.148	0.144	
		(0.215)	(0.209)			(0.267)	(0.245)			(0.285)	(0.253)			(0.212)	(0.195)	
CEO_ownership		0.000	-0.001			-0.001	0.000			0.011	0.011			0.002	0.002	
		(0.006)	(0.007)			(0.003)	(0.002)			(0.011)	(0.011)			(0.003)	(0.003)	
Curr_ratio		-0.071	0.573**			-0.057	0.264			0.017	0.374			-0.052	0.357*	
		(0.043)	(0.221)			(0.050)	(0.232)			(0.083)	(0.441)			(0.039)	(0.182)	
Leverage		-0.002	0.007			0.023*	0.032*			-0.090***	-0.071**			0.005	0.014	
		(0.018)	(0.024)			(0.012)	(0.019)			(0.012)	(0.026)			(0.012)	(0.017)	
ROE		0.011	-0.001			-0.020**	-0.024**			-0.071***	-0.073***			-0.017**	-0.023**	
		(0.007)	(0.009)			(0.008)	(0.009)			(0.012)	(0.013)			(0.006)	(0.008)	
Div		0.315	0.544**			0.234	0.254*			0.531**	0.525			0.289*	0.355**	
		(0.192)	(0.225)			(0.160)	(0.137)			(0.258)	(0.324)			(0.154)	(0.144)	
Sales		0.000	0.000			0.000	0.000			0.000	0.000			0.000	0.000	
		(0.000)	(0.000)			(0.000)	(0.000)			(0.000)	(0.000)			(0.000)	(0.000)	
Acid_test			-0.575*				-0.265				-0.463				-0.361	
			(0.303)				(0.301)				(0.505)				(0.266)	
Cash_ratio			-0.141				-0.132				0.083				-0.123	
			(0.242)				(0.198)				(0.142)				(0.196)	
Debt_ratio			1.256				0.438				-0.662				0.530	
			(0.789)				(0.754)				(1.107)				(0.677)	
ROA			0.996				0.129				0.152				0.319	
			(0.770)				(0.776)				(0.993)				(0.643)	
EBIT			0.000				0.000**				0.000				0.000	
			(0.000)				(0.000)				(0.000)				(0.000)	
AssetsTotal			0.000				0.000				0.000				0.000	
			(0.000)				(0.000)				(0.000)				(0.000)	
Debt_equity			0.000				-0.001**				-0.001***				-0.001	
			(0.000)				(0.000)				(0.000)				(0.000)	
constant	0.655***	-8.262	-5.872	0.667***	0.731***	-5.960	-6.715	0.813***	0.505***	-9.496	-14.281	0.543***	0.693***	-7.016	-7.392	0.747***
	(0.082)	(11.188)	(10.845)	(0.000)	(0.051)	(13.859)	(12.84)	(0.000)	(0.104)	(14.814)	(13.236)	(0.000)	(0.048)	(11.004)	(10.254)	(0.000)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
obs	758.000	462.000	462.000	794.000	758.000	462.000	462.000	794.000	758.000	462.000	462.000	794.000	758.000	462.000	462.000	794.000
R2	0.626	0.674	0.681	0.619	0.690	0.706	0.714	0.688	0.455	0.469	0.475	0.442	0.709	0.730	0.736	0.704
R2_a	0.557	0.592	0.593	0.552	0.632	0.632	0.634	0.633	0.355	0.334	0.329	0.343	0.655	0.662	0.663	0.652

*Note.*Regression of Long Term Ratio (LTR) on each ESG pillar including CEO- and annual fixed effects. Singleton groups have been dropped *p<0.1, **p<0.05, ***P<0.01.

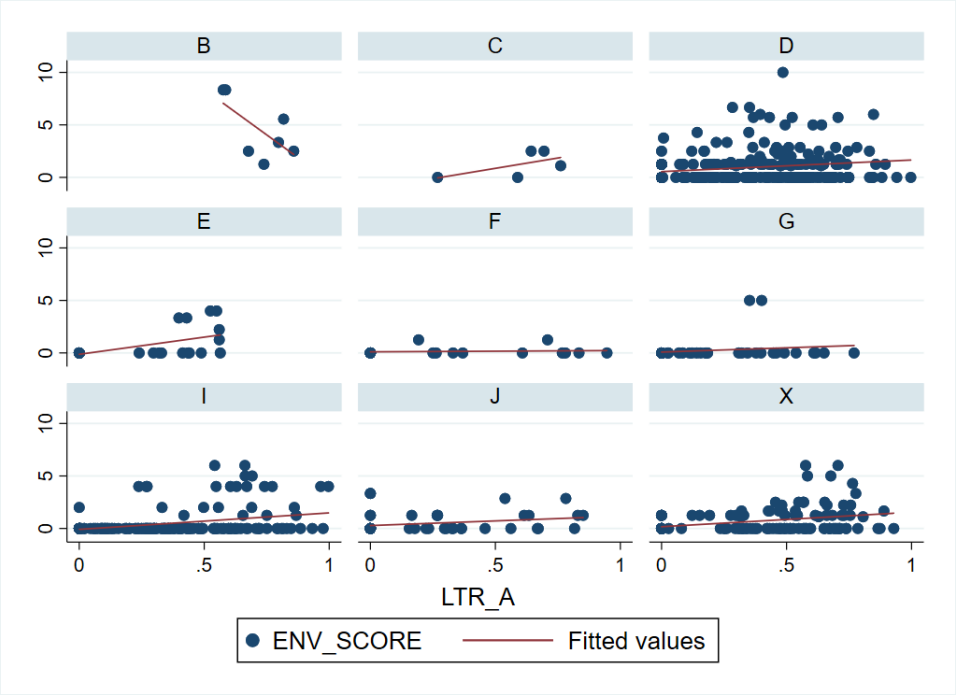

Figure A.7. Interaction plot for Environmental rating

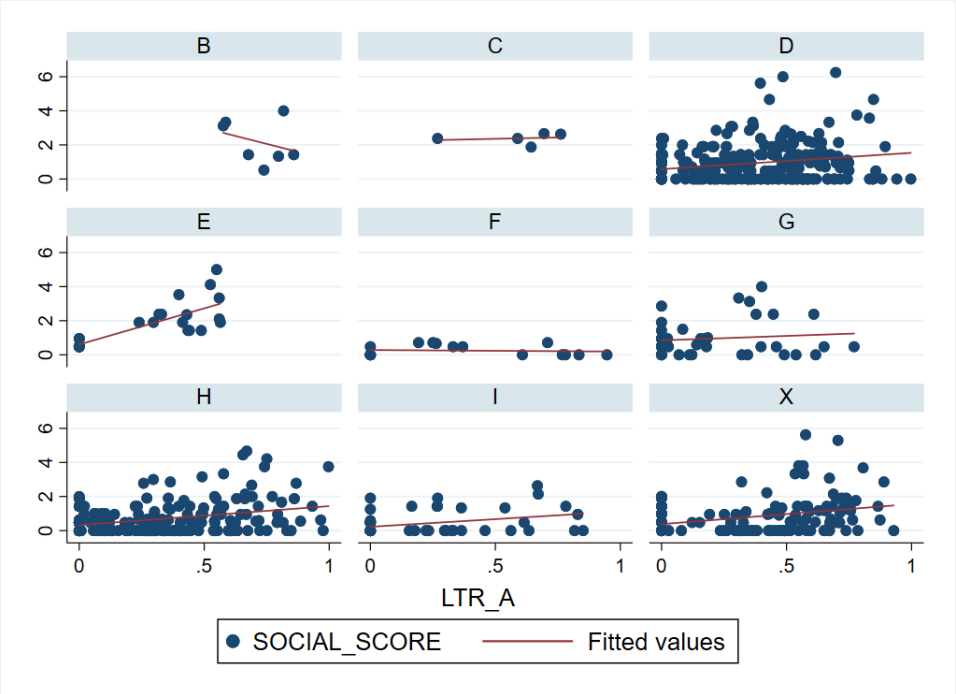

Figure A.8. Interaction plot for Social rating

Figure A.9. Interaction plot for Governance rating

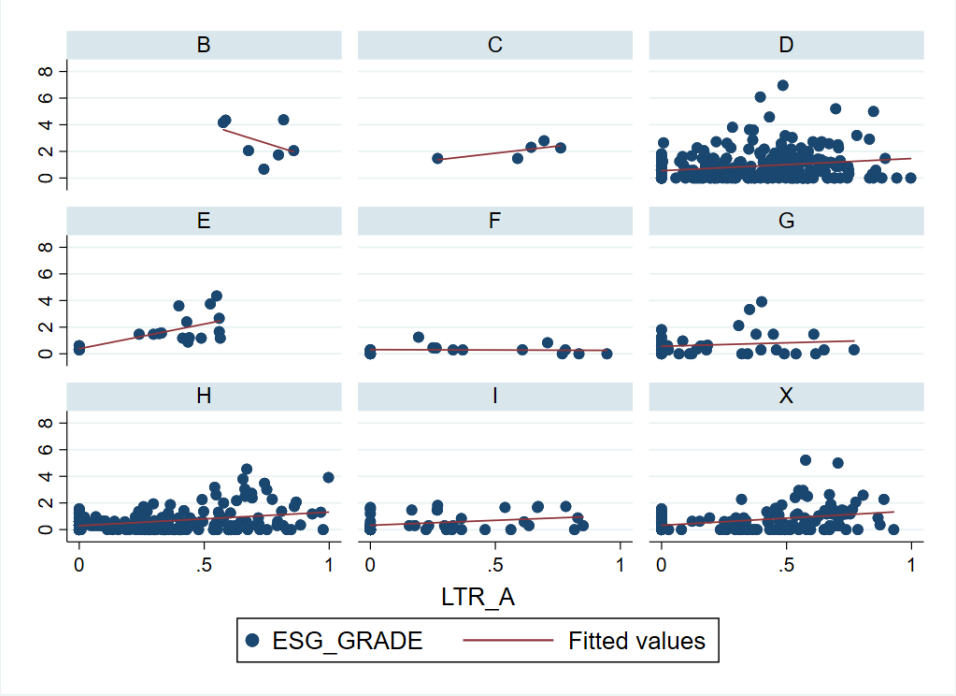

Figure A.10. Interaction plot for ESG rating

Table A.6

Regression results interaction effect.

Variable	ENV		SOCIAL		GOV		ESG	
	I	II	III	IV	V	VI	VII	VIII
LTR	-9.419**	-15.786**	4.915*	-2.984	16.686***	19.116	2.250	-3.790
	(3.161)	(6.705)	(2.845)	(3.966)	(4.288)	(2.464)	(2.537)	(3.955)
IndustryLTR								
C	13.320***	18.720**	-4.623	2.779	-7.607*	-9.928	-0.129	5.311
	(3.199)	(6.800)	(2.877)	(4.003)	(4.338)	(2.718)	(2.571)	(3.985)
D	10.098**	15.583**	-4.262	3.290	-16.464***	-18.710	-1.630	3.965
	(3.199)	(6.695)	(2.881)	(3.912)	(4.254)	(2.403)	(2.561)	(3.924)
E	12.309***	17.640**	-1.049	6.253	-15.746***	-18.54	1.108	6.434
	(3.391)	(7.109)	(3.007)	(4.198)	(4.452)	(2.622)	(2.718)	(4.214)
F	9.529**	14.940**	-4.930*	2.593	-16.966***	-19.797	-2.243	3.255
	(3.177)	(6.696)	(2.847)	(3.958)	(4.342)	(2.703)	(2.545)	(3.944)
G	9.863**	15.117**	-4.679	2.639	-16.992***	-19.611	-2.037	3.303
	(3.251)	(6.653)	(2.892)	(4.036)	(4.397)	(2.545)	(2.600)	(3.979)
H	11.019**	15.899**	-4.228	2.810	-18.007***	-20.04	-1.602	3.587
	(3.374)	(6.687)	(2.968)	(3.942)	(4.439)	(2.477)	(2.662)	(3.933)
I	10.411**	15.044**	-3.921	3.455	-17.104***	-18.427	-1.424	3.932
	(3.300)	(6.734)	(2.915)	(4.032)	(4.391)	(2.576)	(2.591)	(3.990)
X	10.118**	15.255**	-4.121	3.322	-16.882***	-19.486	-1.583	3.864
	(3.334)	(6.840)	(2.915)	(4.040)	(4.538)	(2.596)	(2.623)	(4.024)
Age	-0.007	0.129	-0.015*	0.034	-0.002	0.144	-0.012	0.071
	(0.009)	(0.198)	(0.009)	(0.233)	(0.010)	(0.280)	(0.008)	(0.177)
CEO_ownership	-0.007	-0.001	-0.003	0.000	0.011	0.010	-0.002	0.002
	(0.006)	(0.006)	(0.005)	(0.003)	(0.010)	(0.012)	(0.005)	(0.003)
Curr_ratio	-0.098***	-0.080*	-0.056	-0.047	0.067	0.022	-0.054*	-0.047
	(0.025)	(0.042)	(0.034)	(0.049)	(0.061)	(0.092)	(0.029)	(0.037)
Leverage	-0.069**	0.005	0.030	0.022*	-0.013	-0.081***	-0.001	0.006
	(0.030)	(0.022)	(0.021)	(0.012)	(0.016)	(0.020)	(0.020)	(0.011)
ROE	0.026	0.015*	-0.016	-0.017**	-0.108***	-0.068***	-0.015	-0.014**
	(0.013)	(0.008)	(0.010)	(0.007)	(0.015)	(0.013)	(0.009)	(0.005)
Div	0.280	0.313	0.183	0.126	-0.109	0.365*	0.172	0.201
	(0.184)	(0.220)	(0.156)	(0.141)	(0.164)	(0.213)	(0.139)	(0.140)
Sales	0.000**	0.000	0.000**	0.000	0.000*	0.000**	0.000**	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.899*	-5.543	1.156**	-0.878	0.121	-7.751	1.009**	-2.869
	(0.492)	(10.297)	(0.455)	(12.129)	(0.58)	(14.564)	(0.403)	(9.243)
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
CEO FE	No	Yes	No	Yes	No	Yes	No	Yes
YEAR FE	No	Yes	No	Yes	No	Yes	No	Yes
Observations	469.000	462.000	469.000	462.000	469.000	462.000	469.000	462.000
R2	0.275	0.693	0.357	0.728	0.150	0.509	0.332	0.749
AR2	0.236	0.606	0.322	0.652	0.104	0.371	0.296	0.679

*Note.*Regression of Long Term Ratio (LTR) on ESG pillars, including industry interaction effects. Singleton groups have been dropped for the inclusion of multiple fixed effects *p<0.1, **p<0.05, ***P<0.01.