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Top management team heterogeneity and corporate social responsibility performance

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Abstract

This research investigates the relationship between top management team (TMT) heterogeneity and corporate social responsibility (CSR). Specifically, TMT educational heterogeneity, TMT tenure heterogeneity, and TMT gender heterogeneity. Based on the Upper-Echelon theory, this research argues that CSR performance is affected by the decisions of the TMT. This study investigates this relationship using a sample of European listed firms included in the Refinitiv Eikon database combined with data on TMT members collected from BoardEx. Using Blau's index for heterogeneity, TMT heterogeneity is calculated. The results show a negative relationship between TMT educational and gender heterogeneity on CSR performance, and a positive relationship between TMT tenure heterogeneity on CSR performance. This study reduces the gap in the literature by providing useful insights on the effects of TMT heterogeneities on CSR performance. The findings can help shareholders decide on the composition of their TMT to increase CSR performance. Previous studies have investigated how TMT characteristics influence firm performance. However, studies investigating how TMT characteristics influence CSR performance are limited.

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1   Introduction

Following the global financial crisis in 2007-2008 and international accounting scandals like the Enron case, corporate governance mechanisms and corporate social responsibility (CSR) have been a topic of attention for research over the last decade (Erkens, Hung, & Matos, 2012; Akbar, Kharabsheh, Poletti-Hughes, & Shah, 2017). Prior literature agrees that the failure of corporate governance mechanisms is one of the main reasons the crisis and these scandals happened (Berger, Kick, & Schaeck, 2014; Cornett, McNutt, Strahan, & Tehranian, 2011). Combined with the increasing worldwide concerns about climate change, companies face increasing pressures from stakeholders to engage in CSR (Harjoto, Laksmana, & Lee, 2015). Following stakeholder theory, Freeman et al. (2004) argue that corporate management is required to satisfy the need of stakeholders to maximize firm value. The stakeholders' group includes shareholders, creditors, employees, customers, and local communities. Prior literature focuses mostly on the board of directors as the main representatives of the shareholders to oversee and fulfil the demands of multiple stakeholders (Harjoto, Laksmana, & Lee, 2015; Naciti, 2019; Gallego-Álvarez & Pucheta-Martínez, 2019), since the board of directors is the main representatives of the interests of the shareholders. However, recent studies have shifted the focus from the board of directors to the top management team (TMT) (Shakil & Abdul Wahab, 2021; Waldman, de Luque, Washburn, & House, 2006). TMT is responsible for implementing a firm's key strategies and decisions, for instance, environmental, social, and governance strategies (Shakil & Abdul Wahab, 2021). This is why is it argued that TMT has a significant impact on the CSR strategies of firms. However, in some cases, a firm engages in CSR to ensure legitimacy. By engaging in CSR strategies, firms may achieve a favourable image or relationship with customers (McWilliams & Siegel, 2001). However, engaging in CSR also underlines an agency problem or conflict of interest with the shareholders and managers. Managers can use CSR as a means to further their own social, political, or personal agendas, at the expense of shareholders (McWilliams & Siegel, 2001). Kim et al. (2014) argue that TMT engages in CSR to cover up bad news and distract shareholders. When shareholders discover this, it is reflected in the stock price. This is why, following the upper-echelon theory introduced by Hambrick & Mason (1984), there has been a stream of literature that investigates the relationship between top management and organizational outcomes. The upper-echelon theory

assumes that managers are confronted with more information than they can handle, and therefore will fall back on their experiences, preferences, and other biases to deal with this barrage (Cho & Hambrick, 2006). Furthermore, different CSR strategies result in different CSR performance outcomes. In recent literature, CSR performance is linked to firm performance (Chen, Hung, & Wang, 2018). Which makes it interesting to investigate how TMT affects the strategic decision-making process around CSR strategies, which affects CSR performance. So, companies can recognize if their TMT composes a CSR strategy under false pretenses, or how firms can optimize their TMT composition to maximize CSR performance.

1.1   Research problem & motivation

Most prior literature is focused on the effect of TMT characteristics on firm performance (Aboramadan, 2020; Berger, Kick, & Schaeck, 2014; Burkhardt, Nguyen, & Poincelot, 2020). However, research on TMT characteristics and CSR is limited. Dahms et al. (2021) investigate how national diversity in TMT affects strategic CSR focus in foreign-owned subsidiaries. Shakil et al. (2021) show a moderating effect of CSR on the relation between top management heterogeneity and firm risk. However, they do not zoom in on the direct relation between TMT heterogeneity and CSR performance. Even though TMT demographic characteristics are linked to corporate strategic change (Wiersema & Bantel, 1992), TMT demographic characteristics are yet to be linked to CSR performance. It is argued that TMT influences the strategic decision-making process (Carpenter M. A., 2002; Nielsen, 2010; Wiersema & Bantel, 1992), much like the characteristics of the board of directors have an impact on strategic decision-making (Berger, Kick, & Schaeck, 2014; Kim, Li, & Li, 2014; Endrikat, de Villiers, Guenther, & Guenther, 2020), which affects CSR strategy and performance (Porter & Kramer, 2006). Also, the relationship between CEO characteristics and CSR performance has been the subject of research. Manner (2010) found that CEO characteristics predict differences in corporate social performance (CSR PERFORMANCE) between firms, even when firm and industry characteristics are controlled for. Furthermore, Lewis et al. (2014) found that CEO characteristics such as tenure and education influence a firm's likelihood to voluntarily disclose environmental information. The research on the relationship between CEO characteristics and CSR is based on the upper-echelon theory, and even though the

upper-echelon theory claims that TMTs have a strong influence on strategic decisions, and CEOs are part of the TMTs in most cases, there seems to be a gap in the literature which addresses the link between TMT characteristics and CSR performance. Although the literature on TMT characteristics and organizational outcomes is increasing, the results are still inconclusive (Aboramadan, 2020). The possible reason for the lack of strong empirical consensus between TMT characteristics and performance is the variance of frameworks and diverse methodological approaches (Nielsen, 2010). The importance of high CSR performance for firms is increasing with the increasing demands from stakeholders (Kim, Li, & Li, 2014).

Furthermore, in research that focuses on the relationship between TMT characteristics and organizational outcome (i.e., firm performance), differences in values, experience, and biases result in different strategies (Shakil & Abdul Wahab, 2021; Waldman, de Luque, Washburn, & House, 2006; Cho & Hambrick, 2006). TMT heterogeneity is a concept that assumes that heterogeneity in TMT leads to different strategic decisions (Aboramadan, 2020; Shakil & Abdul Wahab, 2021; Nielsen, 2010; Carpenter M. A., 2002). However, in terms of the consequences of TMT heterogeneity, results have also been inconclusive (Nielsen, 2010). Given that the results are inconclusive, there is a need for more empirical evidence on the relationship between TMT heterogeneity and CSR. Also, Carpenter (2002) stresses that upper-echelon researchers think more critically about the conditions under which demographic characteristics are most likely to influence organizational outcomes. This implies that besides the direct relationship between TMT characteristics and CSR, research has to take moderating effects into account.

1.2   Research objectives

This research goes beyond the singular relationship between a single TMT characteristic and its effect on CSR but investigates how multiple TMT characteristics and TMT heterogeneity influence the strategic decision-making process about engaging in CSR. Therefore, gaining a deeper understanding of the complex relationship between TMT characteristics and CSR and CSR performance, and fills the existing gap in academic literature between TMT characteristics, TMT heterogeneity, and CSR performance. This research combines the TMT characteristics education,

experience, and gender with TMT heterogeneity on CSR performance. This way, insights are gained into which characteristic has the most influence on CSR performance, and whether heterogeneity of a TMT characteristic increases or decreases this relation, by taking TMT heterogeneity as a moderating effect. This way, this research goes beyond existing literature that investigates whether TMT heterogeneity affects organizational outcomes and strategic decision-making, but rather investigates how TMT characteristics affect CSR performance, and how that relationship is strengthened or weakened by TMT heterogeneity. The results of this study help firms decide on how to form their TMT. When results indicate a strong positive relationship between gender and CSR performance, being strengthened by gender heterogeneity, firms can take this into account when they compose their TMT. Furthermore, since the results from prior literature on TMT characteristics and CSR are inconclusive, adding empirical evidence improves the understanding of the relationship. This leads to the main question of this paper:

What is the relationship between TMT characteristics diversity and CSR performance?

1.3 Research methodology

The research question is answered through a literature review, based on which hypotheses are formulated, and quantitative data analysis of secondary data. The data is collected from multiple online sources, such as BoardEx, and Thomson Reuters DataStream. TMT characteristics are collected through BoardEx, and CSR performance data is collected through Thomson Reuters DataStream. Following Tashman et al. (2019), CSR performance is measured through the environmental and social pillar scores from Thomson Reuters DataStream. Thomson Reuters DataStream and BoardEx are databases with financial and non-financial information used by investors. The data analysis is done through regression analysis. This allows for the predictive power of the independent variable on the dependent variable. A quantitative study allows for a bigger sample size which makes the result generalizable.

1.4   Thesis outline

Chapter one provides the subject, background, and relevance of this study. In chapter two, a theoretical framework is presented through a review of prior literature. This allows for the operationalization of the key concepts. This literature review consists of literature on CSR and CSR performance, and how TMT characteristics and TMT heterogeneity influence CSR and CSR performance through the upper-echelon theory. Based upon the literature review, sub-questions with hypotheses are made. Chapter three provides a more in-depth analysis of the data. Then, chapter four presents the results of the analysis. Chapter five and six conclude, discuss, and give implications for further research.

2   Literature review

2.1   Managerial characteristics and CSR performance

How a company's outcomes around CSR are measured in this research will be described as CSR performance. Manner (2010) builds on the framework provided by Wood (1991) that splits the CSR performance construct into (1) principles of CSR that define behavior, (2) processes of corporate social responsiveness that define the management of CSR principles, and (3) the measurement of outcomes in terms of social impacts of corporate behavior, programs, and policies (Wood, 1991). Manner (2010) uses this framework to measure how CEO characteristics influence CSR performance. Therefore, it provides a basis for this research to operationalize CSR outcomes as a result of differences in TMT characteristics. Wood argues that evaluating the principles of CSR requires analysis at individual, organizational, and institutional levels. Thus, principles of CSR motivate human and organizational behavior. The reason why companies give such importance to CSR performance is explained through the stakeholder theory introduced by Freeman (1984). The stakeholder theory explains a firm's decisions regarding CSR as fulfilling the demands of stakeholders. According to Freeman (1984), stakeholders include shareholders, employees, customers, creditors, and local communities. Therefore, the stakeholder theory provides a logical way to examine issues related to CSR performance (Manner, 2010). This approach is widely used to frame issues regarding strategic management literature (McWilliams & Siegel, 2001; Harjoto, Laksmana, & Lee, 2015; Tashman, Marano, & Kostkova, 2019; Cho & Hambrick, 2006). The definition of CSR, and therefore what defines a positive CSR performance (Manner, 2010), is described as: "actions that appear to further some social good, beyond the interests of the firm and that which is required by law" (McWilliams and Siegel 2001, p. 117). This definition of CSR underlines the main idea of CSR, that engaging in CSR means that a company is operating in ways that benefit society, instead of negatively impacting society.

To explain how management characteristics affect firm outcomes, this paper build on the theoretical framework provided by Hambrick & Mason (1984) that discerns characteristics of a firm's top managers in their Upper-Echelon Theory (UET). They define the UET as:

Organizational outcomes–both strategies and effectiveness – are viewed as reflections of the values and cognitive bases of powerful actors in the organization. (Hambrick and Mason, 1984, p. 193)

The UET assumes that differences in cognitive biases of decision-makers can change strategic choices of management which influences performance because a decision-maker's cognitive biases and personal values act as screens or filters when analyzing and interpreting complex situations. They propose that demographic characteristics such as age, functional experience, and education can be used as indicators of cognitive biases and personal values (Manner, 2010; Hambric & Mason, 1984). They argued that this theory would provide scholars with predictive powers and provide support to companies in their decisions when hiring executive managers. The hypotheses on how TMTs impact CSR performance are grounded in this theoretical framework.

In a review paper by Hambrick (2007) on upper-echelon research, it is concluded that many characteristics proposed by the UET have been linked to strategic decisions and firm performance outcomes. Carpenter et al. (2004) argue that researchers no longer have to continue validating the theoretical framework of the UET since its validity has been proven by many different business settings on strategic questions and performance outcomes. In their revisited UE model, they integrate empirical findings of recent research with the original model. In that model, social performance is seen as an organizational outcome, which is directly affected by theoretical constructs which are proxied by TMT demographics. Therefore, this research tries to add to that literature by investigating the relationship between TMT characteristics and CSR performance. TMT demographic characteristics are used as a proxy for the types of complex psychological and cognitive biases that cannot be directly observed (Manner, 2010). By using observable characteristics of TMTs, a larger sample of different companies and TMTs can be acquired.

2.2   Hypotheses

TMT heterogeneity is a concept that builds on the decision-making process of the UET. TMT heterogeneity means differences among team members in demographics and important cognitive aspects, values, and experiences (Carpenter, 2002). Heterogeneous teams are assumed to have a broader set of skills and knowledge which allows the team to obtain information from different sources and different opinions from team members (Carpenter, 2002). Therefore, heterogeneous teams can make better strategic decisions, since the different opinions and skills provide the team with more resources. Hambrick & Mason (1984) agree with the idea that TMT heterogeneity leads to better strategic decision-making. However, they also consider the idea that homogeneous teams can communicate better, develop effective work relationships and improve team coherence because team members have similar social backgrounds, education, and work experience (Ping, 2007). Nevertheless, according to Carpenter et al. (2004), there seems to be a consensus on the idea that heterogeneous teams are positively associated with a firm's competitive actions. Heterogeneous TMTs are more likely to initiate competitive attacks of greater complexity and shorter duration (Carpenter, Geletkanycz, & Sanders, 2004). This study will focus on four specific TMT characteristics heterogeneity based on the framework provided by Carpenter et. al (2004). Namely, (1) educational heterogeneity, (2) level of education, (3) tenure heterogeneity, and (4) gender heterogeneity.

Educational heterogeneity is related to CSR performance because it provides an indicator of the diversity of skills and cognitive processes, as well as the basic knowledge, embedded in a TMT (Carpenter & Fredrickson, 2001; Carpenter M. A., 2002; Hambric & Mason, 1984; Wiersema & Bantel, 1992). Education is also associated with someone's ability to process information (Wiersema & Bantel, 1992). Lewis et al. (2014) found that CEO characteristics such as education and tenure influence a firm's likelihood to voluntarily disclose environmental information. They argue that CEOs with MBA degrees are more likely to respond to environmental pressures and how those environmental issues should be addressed. Huang (2012) states that CSR performance, as measured by the consistency of CSR rankings, is associated with their specialization in MBA and science (MSc).   Manner (2010) shows that a company's KLD Research Analytics CSR

performance ratings are positively related to the CEO having a bachelor's degree in humanities and negatively related to the CEO having a bachelor's degree in economics. Manner (2010) argues that CEOs with a bachelor's degree in economics tend to focus on short-term personal gains, while CEOs with a bachelor's degree in humanities take the environmental pressures more into account in their decision-making. These studies suggest that differences in the educational background of executive managers are related to CSR strategies and CSR performance. Much like educational background, Hambrick and Mason (1984) argue that functional diversity is an indicator of cognitive biases and values since top executives usually bring an orientation that is developed in some primary functional area. In line with the general view on TMT heterogeneity that a diverse TMT, comprised of managers with functions from multiple backgrounds, brings a broader set of skills and opinions and therefore enhances strategic decision-making and performance (Carpenter, Geletkanycz, & Sanders, 2004; Carpenter M. A., 2002). It is also suggested that the demographic composition of executives leads to different strategic choices (Cannella, Park, & Lee, 2008; Zimmerman, 2008). Therefore, executive demographic composition does have an impact on the firm's strategy (Huang, 2012). Therefore, in line with the reasoning on educational heterogeneity of TMTs stated earlier, the following hypothesis is reached:

Hypothesis 1: There will be a positive relationship between a TMT's educational background heterogeneity and the level of CSR performance.

Hypothesis 2: There will be a positive relationship between a TMT's level of education and the level of CSR performance.

The TMT tenure reflects the work time of managers as a team (Ping, 2007). There is a strand of literature that supports the thought that homogeneous team tenure is positively associated with the team's ability to create consensus on fundamantal decisions (Aboramadan, 2020) because similar team tenure reflects a similar understanding of the company's strategies (Aboramadan, 2020). However, literature shows that heterogeneous tenure TMTs are positively associated with strategic change and company performance (Carpenter, Geletkanycz, & Sanders, 2004; Hambrick,

2007), and a company's CSR performance is determined by its CSR strategies (Shaukat, Qiu, & Trojanowski, 2016). In line with Wiersema & Bantel (1992), who claim that heterogeneity in team tenure reflects that there have been various promotions at different times, suggesting new perspectives on the strategic vision of the firm. This leads to the second hypothesis:

Hypothesis 3: There will be a positive relationship between a TMT's tenure heterogeneity and the level of CSR performance.

Carpenter et al. (2004) suggest that gender is a characteristic that needs more focus in UE research. Manner (2010) argues that gender seems to be a relevant characteristic to test relative to CSR performance. According to prior literature, women possess traits and values that come forth through how women are raised from childhood to be more nurturing and compassionate to others, which makes them more susceptible and aware of the needs of stakeholders (Burkhardt, Nguyen, & Poincelot, 2020). This is embedded in their cognitive biases which means that it affects how they approach corporate strategies (Carpenter, Geletkanycz, & Sanders, 2004). Furthermore, Burkhardt et al. (2020) show that firms with more women in top management exhibit higher environmental performance. 1999). Also, Séto-Pamies (2015) shows that companies with more women in executive positions are more socially responsible. McGuinness et al. (2017) show that greater gender balance in top management supports stronger CSR performance in Chinese listed firms. Due to women in executive positions lead to a greater CSR orientation, and therefore a more proactive and comprehensive CSR strategy, resulting in a higher environmental and social performance (Shaukat, Qiu, & Trojanowski, 2016). These arguments lead to the following hypothesis:

Hypothesis 4: There will be a positive relationship between a TMT's gender heterogeneity and the level of CSR performance.

3   Research method

3.1   Sample and data collection

To test the hypotheses, this paper uses European-listed companies that disclosed CSR information in a report in 2020. The dataset consists of large European firms collected through the Thomson Reuters database. Thomson Reuters provides a complete set of environmental, social, and governance (ESG) scores for listed firms using public resources such as company annual reports and stock exchange filings (Refinitiv, 2022). The firms included in this study are firms with available data concerning ESG scores. There are 22 countries in the sample for this study. Even though Great Britain has left the European Union, this study still contains firms from Great Britain. Most firms in this sample are located in France, followed by Germany. Table 1 gives a detailed overview of the countries in the dataset. Since each variable represents a TMT member, the frequency shown in Table 1 means the amount of TMT members that are present from companies residing in that country. Table 2 shows which sectors are included in the dataset. In total there are 35 sectors included. Most observations operate in the Banks sector. These sectors are then divided into industries from which dummies are made. These industries are based upon SIC code classification. An overview of industry dummies is made in chapter 3.4.

Appendix 8.1 shows an overview of companies used in the dataset and the frequency is the number of members who can be seen as part of the TMT. Information regarding the TMTs is derived from the BoardEx database. Therefore, datasets from BoardEx and Refinitiv Eikon have to be merged. This is possible through linking the unique identifier companies (ISIN) used by Refinitiv Eikon and linking the ISIN with the unique company identifier used in Boardex (CompanyID). Then the unique identifier of TMT members (DirectorID) has to be linked to CompanyID. However, since data collected from BoardEx consists of top managers who are also part of the board of directors, observations have to be dropped. Since this study distinguishes TMT members as a separate part of the organization from the board of directors. After merging the dataset and accounting for top managers who are not part of the board of directors, roughly 15.000 observations are dropped. In a regression, variables containing missing values are

dropped. Roughly 1000 variables containing missing values are dropped. This leads to the final dataset of 4.194 observations.

Country	Freq.	Percent	Cum.
AUSTRIA	42	1.00	1.00
BELGIUM	146	3.48	4.48
DENMARK	113	2.69	7.18
FAROE ISLANDS	15	0.36	7.53
FINLAND	115	2.74	10.28
FRANCE	640	15.26	25.54
GERMANY	509	12.14	37.67
GREECE	49	1.17	38.84
IRELAND	125	2.98	41.82
ITALY	382	9.11	50.93
LUXEMBOURG	98	2.34	53.27
NETHERLANDS	253	6.03	59.30
NORWAY	113	2.69	61.99
POLAND	73	1.74	63.73
PORTUGAL	33	0.79	64.52
ROMANIA	7	0.17	64.69
RUSSIAN FEDERATION	22	0.52	65.21
SPAIN	335	7.99	73.20
SWEDEN	379	9.04	82.24
SWITZERLAND	358	8.54	90.77
TURKEY	256	6.10	96.88
UNITED KINGDOM	131	3.12	100.00
Total	4194	100.00	

Table 1: Tabulated overview of countries

Sector	Freq.	Percent	Cum.
Automobiles & Parts	19	0.45	0.45
Banks	747	17.81	18.26
Beverages	114	2.72	20.98
Business Services	177	4.22	25.20
Chemicals	231	5.51	30.71
Clothing & Personal Products	43	1.03	31.74
Construction & Building Materials	167	3.98	35.72
Consumer Services	3	0.07	35.79
Diversified Industrials	200	4.77	40.56
Education	15	0.36	40.92
Electricity	51	1.22	42.13
Electronic & Electrical Equipment	231	5.51	47.64
Engineering & Machinery	123	2.93	50.57
Food & Drug Retailers	22	0.52	51.10
Food Producers & Processors	127	3.03	54.12
Forestry & Paper	10	0.24	54.36
General Retailers	2	0.05	54.41
Health	58	1.38	55.79
Information Technology Hardware	63	1.50	57.30
Insurance	409	9.75	67.05
Leisure & Hotels	135	3.22	70.27
Leisure Goods	4	0.10	70.36
Life Assurance	61	1.45	71.82
Media & Entertainment	52	1.24	73.06
Mining	23	0.55	73.61
Oil & Gas	17	0.41	74.01
Pharmaceuticals and Biotechnology	259	6.18	80.19
Publishing	31	0.74	80.93
Real Estate	24	0.57	81.50
Renewable Energy	71	1.69	83.19
Software & Computer Services	245	5.84	89.03
Speciality & Other Finance	146	3.48	92.51
Steel & Other Metals	92	2.19	94.71
Transport	190	4.53	99.24
Utilities - Other	32	0.76	100.00
Total	4194	100.00	

Table 2: Tabulated overview of sectors

3.2   Variables

3.2.1   Dependent variable

CSR performance has been measured differently throughout previous literature since there is no clear definition of what CSR performance should be. Mellahi et al. (2015) state that previous literature defines CSR strategy and performance through multiple different theories and perspectives. This proves that creating a clear definition of CSR performance is difficult. There is a strand of literature that focuses on CSR reporting quantity and CSR reporting quality (Michelon, Pilonato, & Federica, 2015; Bacha, Ajina, & Ben Saad, 2021). These studies measure CSR performance through an analysis of CSR reports where data in those reports are coded into various categories. Therefore, only focuses on the quantity of the CSR report, while mostly neglecting the quality of the CSR report. CSR performance is measured through a keyword count where a higher number of keywords correspond to a higher CSR reporting quality. However, CSR performance can also be measured by variables other than variables relying on CSR reporting quantity to define CSR performance. Burkhardt et al. (2020), Del Giudice & Rigamonti (2020), and Tamimi & Sebastianelli (2017) use ESG scores as a measurement of the CSR performance of firms. Following Burkhardt et al. (2020), this study measures CSR performance by utilizing a sustainability rating of Environmental, Social, and Governance (ESG) scores. To measure the effect of TMT characteristics on CSR performance, ESG scores measure CSR reporting and practices quality. Therefore, this variable fits this study better than only looking at CSR reporting and quality.

This paper uses ESG data from Thomson Reuters Refinitiv[1]. Thomson Reuters Refinitiv provides ESG information on listed firms and uses public sources such as company annual reports and stock exchange filings (Refinitiv, 2022). Refinitiv captures and calculates company-level ESG measures of the most comparable and material per industry. These measures are grouped into 10 categories that reformulate the three pillar scores and the final ESG score (Refinitiv, 2022). The category scores are rolled up into the three pillar scores. The ESG score is a relative sum of

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[1] Formerly known as ASSET4 database.

category weights, which can vary per industry. Refer to Table 3 for each category and its description. This score reflects a company's ESG performance, commitment, and effectiveness based on publicly-reported information. Therefore, ESG scores take into account other CSR practices than only CSR reporting by also looking at information on the company's website, NGO websites, Stock Exchange filings, annual reports, and news sources (Refinitiv, 2022). Thomson Reuters offers ESG scores ranging from 0 to 100. Scoring in the first quartile from 0 to 25 indicates poor relative ESG performance and an insufficient degree of transparency in reporting material ESG data publicly. The second quartile ranging from 25 to 50 indicates satisfactory relative ESG performance and a moderate degree of transparency in reporting ESG data publicly. The third quartile from 50 to 75 indicates good ESG performance and an above-average degree of transparency, and the fourth quartile from 75 to 100 indicates excellent relative ESG performance and a high degree of transparency. Expanding on ESG scores, Refinitiv offers ESG combined scores. ESG combined overlays the ESG scores with ESG controversies to provide a comprehensive evaluation of the company's sustainability over time. ESG combined discounts the ESG score for the news controversies that materially impact corporations. The underlying measures are granular and extensive enough to differentiate companies with minimal CSR performance from companies with superior CSR performance in their respective industries. Therefore, to measure the effect of TMT characteristics on CSR performance, this study uses ESG combined as the dependent variable.

Pillar	Category Score	Definition
Environmental	Resource use	Reflects a company's performance and capacity to reduce the use of materials, energy, or water, and to find more eco-efficient solutions by improving supply chain management.
	Emissions reduction	Measures a company's commitment and effectiveness towards reducing environmental emissions in its production and operational processes.
	Innovation	Reflects a company's capacity to reduce the environmental costs and burdens for its customers, thereby creating new market opportunities through new environmental technologies and processes, or eco-designed products.
Social	Workforce	Measures a company's effectiveness in terms of providing job satisfaction, a healthy and safe workplace, maintaining diversity and equal opportunities, and development opportunities for its workforce.
	Human rights	Measures a company's effectiveness in terms of respecting fundamental human rights conventions
	Community	Measures the company's commitment to being a good citizen, protecting public health, and respecting business ethics.
	Product responsibility	Reflects a company's capacity to produce quality goods and services, integrating the customer's health and safety, integrity, and data privacy.
Governance	Management	Measures a company's commitment and effectiveness towards following best practice corporate governance principles.
	Shareholders	Measures a company's effectiveness towards equal treatment of shareholders and the use of anti-takeover devices.
	CSR strategy	Reflects a company's practices to communicate that it integrates economic (financial), social and environmental dimensions into its day-to-day decision-making processes

Table 3: ESG category scores definitions (Refinitiv, 2022)

3.2.2   Independent variables

To measure how TMT characteristics influence CSR performance, the main independent variables are TMT functional heterogeneity, TMT educational heterogeneity, TMT tenure heterogeneity, and TMT gender heterogeneity. TMT data is used from the BoardEx database. To calculate the heterogeneity of TMT characteristics, the Blau index is calculated (Blau, 1977). The Blau index is calculated as follows:

$$(1 - \sum p_i^2)$$

Where p_i refers to the proportion of group members in each of the i categories. This results in a value ranging from 0 to 1 where values close to 0 are interpreted as homogeneous and values close to 1 are interpreted as heterogeneous. This allows a measurement of how each characteristic influences CSR performance. However, for TMT gender heterogeneity it ranges from 0 to 0,5 since TMT members are either male or female, where 0 means 0 diversity and 0,5 means an equal number of women and men. The Blau index is widely used as a measure of TMT heterogeneity in research. For instance, Díaz-Fernández (2014) uses the Blau index to measure TMT demographic characteristics diversity and its influence on company performance. Also, Harjoto, Laksmana, & Lee (2015) use the Blau index for heterogeneity to measure how board diversity influences CSR. Therefore, this research follows the framework of prior literature on how to measure heterogeneity in TMT demographic characteristics.

To measure the educational heterogeneity, this research follows the framework of Wiersema & Bantel (1992) that diversity in educational level and background is associated with better knowledge within the team. Furthermore, as formal education reflects an individual's cognitive abilities, diversity in educational background is associated with diversity in top managers' perspectives (Díaz-Fernández, 2014). This study distinguishes the difference between TMT members who have a bachelor's degree or higher and members who do not. Since often level of education differs between countries, this study takes the European Qualifications Framework

(EQF) and takes the level of above-average (EQF Level 6) as a cutoff. By making this distinction, it allows a creation of a dummy variable, which correlates to 1 if a TMT member possesses an EQF level 6 degree or higher and 0 if they do not. This corresponds to the data shown in Table 4. Of the TMT members in the data, 16.09% do not have a degree above EQF level 6 and 83.91% own an EQF level 6 degree or higher. Furthermore, by distinguishing between high and low education in TMTs, an analysis can be made differentiating between TMTs consisting of members with higher levels of education and lower levels of education and whether those differences have different relationships with CSR performance. Furthermore, since BoardEx handles separate degrees of top managers as single observations, duplicates have to be deleted to avoid a biased dataset.

Education dummy	Freq.	Percent	Cum.
0	675	16.09	16.09
1	3519	83.91	100.00
Total	4194	100.00	

Table 4: Tabulation of Educationdummy

TMT tenure heterogeneity refers to diversity in the number of years TMT members have worked for that firm. Data collected from BoardEx gives the date when a top manager started his or her role, and the date when a member does not work for the company anymore. Heterogeneity of TMT tenure indicates that various members have been promoted at different times which could lead to an influx of new perspectives on strategic change and decision-making (Wiersema & Bantel, 1992). Following with Wiersema & Bantel (1992), TMT tenure heterogeneity is calculated by dividing TMT tenure into short tenure, average tenure, and long tenure. Table 5 shows the descriptive statistics of TMT tenure with values ranging from 0 to 55. A value of 0 indicates that a TMT member was promoted in 2020. A TMT member falls under the category of short tenure when he or she is active for less than 2 years in his or her role, and a TMT member falls into the category of long tenure when he or she is active for more than 8 years in his or her role. A TMT member falls under the average tenure when he or she has worked for 2 to 7 years

in his or her role. By transforming TMT tenure into categorical data, Blau's index for heterogeneity can be calculated. This results in values between 0 and 1 where values close to 1 are interpreted as heterogeneous and values close to 0 are interpreted as homogeneous. A TMT is considered fully homogeneous when all members fall into the same tenure category.

Descriptive Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Tenure	4194	5.027	5.17	0	55

Table 5: Summary of TMT tenure

The last independent variable is TMT gender heterogeneity. TMT gender heterogeneity is a categorical value that equals 1 when a TMT member is male and 0 when a TMT member is female. Therefore, Blau's index for heterogeneity can be calculated. For the dataset in this study, 20.72% of all top managers are female and 79.28% are male. This is in accordance with studies on gender diversity in top management that state females are underrepresented in respect to their male counterparts in top management, and urge the need for more female members in top management to increase company performance (McGuinness, Vieito, & Wang, 2017; Séto-Pamies, 2013).

3.2.3   Control variables

To control for external factors that could influence CSR performance, several control variables are used. The use of these control variables is based upon prior literature that examined the relationship between the control variables and CSR performance. The control variables used are the company-specific variables size, price-earnings ratio, financial leverage, and industry (Ting, 2021; Barnea & Rubin, 2010).

Company size is based upon the number of employees of firms. In accordance with the legitimacy theory, larger firms tend to engage in more CSR activities and are more inclined to disclose their CSR activities to ensure legitimacy (Ting, 2021; Thorne, Mahoney, & Manetti, 2014).

Moreover, larger companies are more exposed to public scrutiny which causes firms to invest more in CSR activities to improve their reputation (Barnea & Rubin, 2010; Gamerschlag, Moeller, & Verbeeten, 2011).

Firm value as measured by the price-earnings ratio has been linked with CSR performance and CSR disclosure much like firm size (Thorne, Mahoney, & Manetti, 2014). Following the same argument as firm size that firms with higher value and profitability are more exposed to public scrutiny (Gamerschlag, Moeller, & Verbeeten, 2011).

Financial leverage is measured as a debt to total assets ratio. Companies with higher financial leverage have greater levels of CSR reporting (Prencipe, 2004; Lee, 2002; Xiao, Yang, & Chow, 2004). This result can be explained by agency theory because companies with more debt have greater agency costs, and there is a possibility of the transfer of wealth from debtholders to stockholders. By increasing the amount of information disclosed, corporations can reduce agency costs and possible conflicts of interest between owners and creditors (Ortas, Gallego-Alvarez, & Alvarez Etxeberria, 2015).

Finally, industry dummies are added to control for industry-specific effects. Industry membership affects the amount of CSR disclosure, possibly due to certain industries being more closely related to receiving media attention (Gamerschlag, Moeller, & Verbeeten, 2011). Therefore, CSR disclosure and performance could be affected by the industry a company belongs to. All variables and their abbreviations are summarized in table 6 on the next page. Some variables have been transformed for normality purposes which are explained in chapter 4.

Variable full name	Abbreviation used in regression	Definition	Data Source
ESG combined score	ESG_combined	Corporate Social Performance is calculated by the mean of the company's environmental and social pillar scores (ESG) corrected for controversies over time.	Thomson Reuters DataStream / KLD
Tenure heterogeneity	TenureHet	Tenure represents the years the members of TMT have worked for the company. Measured through the logarithmic value of Blau's index for heterogeneity.	BoardEx
Educational Background heterogeneity	EducHet	Educational background is a dummy variable that represents a set of all the formal education the member has achieved. Measured through Blau's index for heterogeneity.	BoardEx
Education level	HighEduc	Dummy variable equal to 1 when a TMT member has completed an EQF level 6 or higher education	BoardEx
Gender heterogeneity	GenderHet	Gender heterogeneity is measured as a dummy variable when a company's TMT is male or female. Measured through the logarithmic value of Blau's index for heterogeneity.	BoardEx
Firm Size	Size	Firm size is measured as a natural logarithm of the company's total employees.	Thomson Reuters DataStream
Leverage	Leverage	Leverage represents the ratio of a company's total debt in contrast to the total capital.	Thomson Reuters DataStream
Price/Earnings Ratio (P/E)	lnPER	Price-earnings ratio (P/E) is the year-end share price divided by the earnings per share.	Thomson Reuters DataStream
Industry	Industry	A dummy variable based on the classification of firms among industry groups.	Thomson Reuters DataStream

Table 6: Summary of all variables

3.3   Econometric model and methodology

To test the hypotheses, an equation model is used where CSR performance is measured as ESG combined score and the variation in CSR performance is explained through TMT characteristics and the other factors explained in this model[2]:

$$ESG\_combined_{it}$$
$$= TenureHet_{it} + EducHet_{it} + GenderHet_{it} + Size_{control,it} + Leverage_{control,it}$$
$$+ lnPER_{control,it} + Industry_{control,it} + \varepsilon_{it}$$

The independent variables and the control variables explain variations in the dependent variable (Zhang, 2019). The dependent variable is ESG combined, and the independent variables are the TMT characteristics heterogeneity. This relationship is illustrated in figure 1.
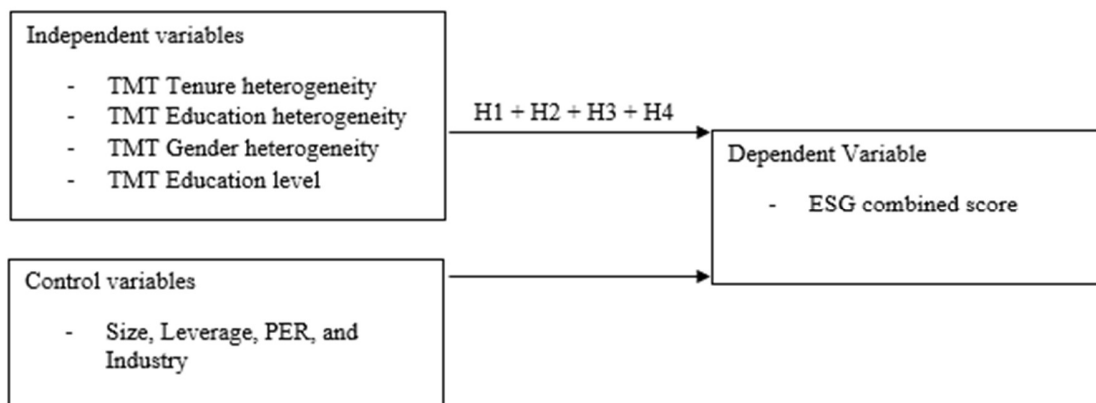
Figure 1: Conceptual model

To test the hypotheses, a linear regression is used to determine the effect coefficients of TMT characteristics heterogeneity on ESG combined score. However, the data has to fulfil all the Ordinary Least Squares (OLS) assumptions which are discussed in chapter 4. An OLS regression reports the T-statistic to test whether the independent variables significantly explain changes in the dependent variable.

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[2] Note: Industry control dummies are grouped in this equation. However, in the regression separate dummies per industry are used.

4　Results

4.1　Summary of statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
ESG combined	4194	62.265	14.731	10.95	92.76
GenderHet	4194	.303	.12	0	.5
EducHet	4194	.247	.128	0	.5
TenureHet	4194	.636	.087	0	.745
lnPER	4194	2.597	.937	.642	7.257
Leverage	4194	47.783	19.581	.29	118.14
Size	4194	9.893	1.592	6.234	12.164

Table 7: Descriptive statistics

Table 7 reflects the descriptive statistics for the variables used in this research. The sample is divided into 10 industries which are further explained in Table 8. For the independent variables, as discussed in chapter 3, values range from 0 to 0,5 for GenderHet and EducHet where 0 indicates fully homogeneous TMTs and 0,5 indicates fully heterogeneous TMTs (Wiersema & Bantel, 1992; Shakil & Abdul Wahab, 2021). TenureHet reflects TMT tenure heterogeneity and values range from 0 to 0.75 where 0 means fully homogeneous TMT tenure and values closer to 0.75 reflect heterogeneous TMT tenure. A fully Homogeneous TMTs in terms of tenure means that all TMT members fall into one category of either short tenure, average tenure, or long tenure.

The dependent variable ESG combines which measures CSR performance, values from 10.95 to 92.76 with a mean of 62.265. This means that out of 4194 observations, the lowest-performing firm in regard to CSR scored 10.95% on the ESG combined score and the highest-scoring firm scored 92.76% on the ESG combined score. The average ESG score of this sample is 62.27%. Table 7 reflects the average ESG combined score per industry. The average ESG combined score of Agriculture, Forestry and Fishing is the lowest scoring industry in the sample. However, due to the low quantity of observations in that industry, it is unclear whether that average ESG combined score can be seen as an outlier or not. The other industries range from approximately 54% to 68% with Retail trade having the highest average ESG combined score of 62.27%. Therefore, following

Gamerschlag, Möller, and Verbeeten (2011), there are notable differences between industries in regard to CSR performance.

For the company-specific control variables, the logarithmic value of PER is taken to account for outliers. The average number of employees is 48.956. However, since the logarithmic value is taken to measure company size, the mean for size is 9.839. The logarithmic value for employees is taken to increase normality. Increasing normality and dealing with outliers are further discussed in chapter 4.2. The average debt to total assets ratio, measured as leverage, shows a mean of 47.78%.

SIC Code	Industry	Abbreviation	Quantity	Average ESG combined score
0100-0999	Agriculture, Forestry and Fishing	Agri	5	39.66%
1000-1499	Mining	Mining	93	58.04%
1500-1799	Construction	Constr	344	56.91%
2000-3999	Manufacturing	Manu	1322	63.74%
4000-4999	Transportation, Communication, Electric, Gas, and Sanitary service	TCEGS	360	65.29%
5000-5199	Wholesale trade	WStrade	102	59.44%
5200-5999	Retail trade	Rtrade	195	68.22%
6000-6799	Finance, Insurance and Real Estate	FIR	1372	62.77%
7000-8999	Services	Ser	501	58.91%
9100-9729	Public Administration	PA	0	

Table 7: Tabulated overview of Industries

4.2   Variable tests

Before the hypotheses can be tested through a linear regression, tests have to be run to check whether the obtained results are not biased. These tests are to check if the assumptions for an Ordinary Least Squares (OLS) regression are met (Berry, 1993).

The first assumption of OLS states that the observations are normally distributed around the mean. If a variable is normally distributed, the resulting t-statistics and p-values are correct. Testing for normality can be done graphically. This can be done by inspecting variables after transforming them. For every variable, the logarithmic value was calculated and compared to the untransformed variables in terms of normality (Appendix 8.2). The normal distribution of the variables PER and Employees (Size) improve after taking the logarithmic values. For the other variables, there are no significant improvements. Therefore, the untransformed variables are taken. By taking the logarithmic values of PER and Employees (Size) the standard deviation and normal dispersion of data are decreased which leads to a more accurate regression.

Multicollinearity can be tested by Pearson's correlation matrix. This test the variables for autocorrelation. This test calculates the correlation coefficient which is a measure of linear correlation between two sets of data. Table 8 shows the results of Pearson's correlation matrix. Values close to 0 mean that there is no form of correlation and values close to 1 mean that two variables are correlated. Overall, the dataset shows no sign of correlation. Except for Size and TenureHet, which can be explained by the fact that companies with more employees tend to have larger a larger TMT which could mean that TMTs in larger companies are more diverse in TMT tenure than in smaller companies. However, since the coefficient is only 0.284, this poses no issue for our regression. The same can be said for Size and ESG_combined with a correlation coefficient of 0.278. GenderHet and TenureHet both have positive coefficients of 0.041 and 0.151 respectively. This indicates that when ESG combined score increases, GenderHet and TenureHet also increase. EducHet shows a negative coefficient which corresponds to a decrease of EducHet when ESG combined increases.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
(1) ESG_combined	1.000						
(2) GenderHet	0.041	1.000					
(3) EducHet	-0.084	0.063	1.000				
(4) TenureHet	0.151	0.023	-0.127	1.000			
(5) lnPER	0.063	0.051	-0.231	-0.003	1.000		
(6) Leverage	-0.010	0.097	0.130	-0.020	-0.159	1.000	
(7) Size	0.278	0.053	0.075	0.284	-0.049	-0.003	1.000

Table 8: Pearson's correlation matrix

Next, the dataset is tested for homoscedasticity. This is done through a Breusch-Pagan test or Cook-Weisberg test (Appendix 8.3). The results of this test indicate a chi-squared value of 17.59 which results in a p-value of 0.00. Therefore, the null hypothesis that the model is homoscedastic can be rejected. This means that standard deviations of a predicted variable or non-constant. To control for heteroscedasticity, robust standard errors are included.

Lastly, the Variance Inflation Factor (VIF) of all variables is determined. The VIF measures a variable for multicollinearity. Multicollinearity means that several independent variables in a model are correlated. When a VIF of a variable is higher than 3, multicollinearity can influence the results of a regression. Table 9 shows the VIF of all variables and no variable has a VIF higher than 3. Therefore, multicollinearity is not a problem in this dataset. Since the dataset does not consist of panel data, it cannot be tested for autocorrelation.

	VIF	1/VIF
EducHet	1.189	.841
TenureHet	1.116	.896
Size	1.106	.904
HighEduc	1.088	.919
lnPER	1.085	.921
Leverage	1.047	.955
GenderHet	1.022	.978
Mean VIF	1.093	.

Table 9: Variance Inflation Factor

4.3   Multivariate regression

Table 10 shows the results of the multivariate regression. Multivariate regression is a regression with one dependent variable and multiple independent variables. Model 8 and model 9 control for various firm and industry factors. To control for multicollinearity, one dummy variable for industry has to be removed. For further robustness, a regression with robust standard errors is run to control for heteroscedasticity.

Model 1, 2, and 3 show the relationship between the TMT characteristics heterogeneity and CSR performance. TMT tenure heterogeneity (TenureHet) and TMT gender heterogeneity (GenderHet) are both positively related to CSR performance (ESG combined) which means that an increase in heterogeneity leads to an increase in CSR performance. However, TMT gender heterogeneity does not have a significant relationship with CSR performance. Since the relationship is not significant, no conclusions can be made when regressed against CSR performance (ESG combined). TMT educational heterogeneity (EducHet) is significantly negatively related at $t=-5.47$ $p<0.01$ to CSR performance. This indicates that more homogeneous TMTs in terms of the educational background show higher CSR performance. The R-squared of models 1 to 3 is low (0.007, 0.023, and 0 respectively). This means that models 1 to 3 have little explanatory power. To be exact, models 1 and 2 explain 0.7% and 2.3% of the variance in CSR performance. However, other variables might explain the variance in CSR performance. Therefore, control variables are added. In models 3 to 6, the control variables are regressed against CSR performance. All show a significantly positive relationship. In model 7, the control variables are added to the multivariate regression. The R-squared has increased to 9.6%, implying that more variance in CSR performance is explained by the model. Furthermore, the coefficients of TMT educational heterogeneity and TMT tenure heterogeneity are both lower and still significant with the addition of firm-specific effects. However, TMT gender heterogeneity remains non-significantly related to CSR performance.

In model 8, a dummy variable HighEduc is added to investigate the relationship between the level of education of TMTs and CSR performance. This shows no significant relationship which means that the level of education of TMTs does not explain variance in ESG combined.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
	ESG_combined	ESG_combined	ESG_combined	ESG_combined	ESG_combined	ESG_combined	ESG_combined	ESG_combined	ESG_combined
EducHet	-9.685***						-9.904***	-10.02***	-13.76***
	(-5.47)						(-5.58)	(-5.43)	(-7.56)
Tenure-Het		25.58***					10.77***	10.78***	7.336**
		-9.86					-4.09	-4.09	-2.83
Gender-Het			5.094**				3.342	3.342	-3.595**
			-2.68				-1.82	-1.83	(-1.97)
lnPER				0.989***			0.887***	0.886***	0.503*
				-4.08			-3.68	-3.68	-2.09
Leverage					-0.00728		0.00751	0.00746	0.0113
					(-0.63)		-0.66	-0.66	-0.98
Size						2.569***	2.475***	2.475***	3.347***
						-18.72	-17.31	-17.3	-22.59
HighEduc								-0.146	-0.208
								(-0.24)	(-0.35)
Industry Dummy	No	No	No	No	No	No	No	No	Yes
_cons	64.66***	45.99***	60.72***	59.70***	62.61***	36.85***	29.70***	29.85***	16.87***
	-131.31	-27.61	-98.02	-89.18	-104.35	-26.79	-13.54	-13.1	-5.84
N	4194	4194	4194	4194	4194	4194	4194	4194	4194
R-sq	0.007	0.023	0.002	0.004	0	0.077	0.096	0.096	0.164

Note: *** p<.01, ** p<.05, * p<.1

Table 10: Regression results

4.4   Hypotheses testing

To get the most accurate results to test the hypotheses, industry dummy variables are added to the regression to control for industry effects. This is shown in model 9. The results in model 9 show a significant negative relationship between TMT educational heterogeneity (EducHet) and CSR performance (ESG combined). This finding means that homogeneous TMTs in terms of the level of education show better CSR performance since values close to 0 in terms of educational heterogeneity reflect a homogeneous TMT with a high average education. This is in line with findings from Díaz-Fernández (2014) who found a negative relationship between education level diversity and company performance. Therefore, hypothesis one is rejected and hypothesis two is supported. Consistent with Wiersema & Bantel (1992), that average level of education positively affects strategic decision-making.

The results indicate a positive relationship between TMT tenure heterogeneity and CSR performance. As stated by Wiersema & Bantel (1992), a heterogeneous TMT in terms of tenure provides a variety of information resources and outlook on strategic decisions. Therefore, the findings show that heterogeneous TMT teams in terms of tenure show higher CSR performance. Thus, model 9 supports hypothesis three that TMT tenure heterogeneity is positively related to CSR performance.

Model 9 shows a significant negative relationship between TMT gender heterogeneity and CSR performance. However, this relationship only becomes significant with the addition of industry-specific effects. Hypothesis four predicts a positive relationship between TMT gender heterogeneity and CSR performance. Therefore, hypothesis four has to be rejected since the results indicate that homogeneous TMTs in terms of gender show higher CSR performance.

ESG_combined	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
GenderHet	-3.595	1.821	-1.97	.048	-7.166	-.025	**
EducHet	-13.763	1.82	-7.56	0	-17.332	-10.194	***
TenureHet	7.336	2.594	2.83	.005	2.251	12.421	***
lnPER	.503	.24	2.09	.036	.032	.974	**
Leverage	.011	.011	0.98	.326	-.011	.034	
Size	3.347	.148	22.59	0	3.057	3.638	***
HighEduc	-.208	.591	-0.35	.725	-1.368	.951	
Mining	6.732	6.274	1.07	.283	-5.569	19.032	
Constr	8.793	6.133	1.43	.152	-3.23	20.817	
Manu	19.386	6.096	3.18	.001	7.435	31.338	***
TCEGS	18.176	6.124	2.97	.003	6.169	30.183	***
WStrade	19.939	6.226	3.20	.001	7.732	32.145	***
Rtrade	26.06	6.257	4.16	0	13.793	38.327	***
FIR	18.995	6.098	3.11	.002	7.039	30.95	***
Ser	11.191	6.105	1.83	.067	-.779	23.16	*
o	0	.	.	.	.	.	
Constant	10.135	6.405	1.58	.114	-2.422	22.692	

Mean dependent var	62.265	SD dependent var	14.731
R-squared	0.164	Number of obs	4194
F-test	54.727	Prob > F	0.000
Akaike crit. (AIC)	33744.320	Bayesian crit. (BIC)	33845.782

*** p<.01, ** p<.05, * p<.1

Table 11: Regression of model 9

As for control variables, the results indicate a positive relationship between PER (lnPER) and CSR performance, suggesting that firms with higher value are more exposed to public scrutiny and therefore invest more in CSR to ensure legitimacy (Thorne, Mahoney, & Manetti, 2014). Financial leverage (Leverage) also shows a positive relationship with CSR performance. In support of the agency cost theory, firms with more debt have greater agency costs. By increasing CSR performance, firms can reduce agency costs since more information is being disclosed (Ortas, Gallego-Alvarez, & Alvarez Etxeberria, 2015). However, this relationship is not significant. The results additionally show a significant positive effect between firm size (Size) and CSR performance, suggesting that larger firms engage more in CSR activities and disclose more information regarding CSR to ensure legitimacy (Thorne, Mahoney, & Manetti, 2014).

For exploratory research purposes, the TMT gender heterogeneity is regressed with size as an interaction term to see how the relationship changes. Table 12 shows the result of this regression. Now TMT gender heterogeneity is significantly positively related to CSR performance which means that adding an interaction effect caused TMT gender heterogeneity to positively affect CSR performance. However, adding an interaction term changes the way the coefficients are interpreted. The coefficient of TMT gender heterogeneity must now be interpreted as the effect of TMT gender heterogeneity on CSR performance when size equals 0. Vice versa for size. The interaction term coefficient then means that the effect of TMT gender heterogeneity changes when size increases. The coefficient for TMT gender heterogeneity is 128.539. This is the effect of TMT gender heterogeneity on CSR performance when size is 0. However, when size increases, the effect of TMT gender heterogeneity changes with -14.264 the change in size. In general terms, this could mean that TMT gender heterogeneity has a positive effect on CSR performance, but the greater the size of the company, the effect of this relation decreases. Investigating why this could be the case is out of scope for this research. However, this could be explored further in future research.

ESG_combined	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
GenderHet	128.539	10.985	11.70	0	107.004	150.075	***
Size	7.889	.4	19.72	0	7.105	8.673	***
GenderHet*Size	-14.264	1.17	-12.19	0	-16.557	-11.97	***
EducHet	-12.301	1.793	-6.86	0	-15.816	-8.786	***
TenureHet	10.043	2.559	3.93	0	5.027	15.06	***
lnPER	1.525	.251	6.09	0	1.034	2.016	***
Leverage	.013	.011	1.11	.266	-.01	.035	
HighEduc	-.204	.581	-0.35	.726	-1.343	.936	
Agri	-8.861	6.003	-1.48	.14	-20.63	2.908	
Mining	-4.343	1.568	-2.77	.006	-7.418	-1.269	***
Constr	-1.895	.953	-1.99	.047	-3.763	-.027	**
Manu	9.979	.745	13.39	0	8.518	11.44	***
TCEGS	8.361	.945	8.85	0	6.509	10.214	***
WStrade	10.405	1.515	6.87	0	7.435	13.374	***
Rtrade	14.656	1.543	9.50	0	11.63	17.682	***
FIR	9.162	.748	12.25	0	7.695	10.628	***
Constant	-26.753	4.561	-5.87	0	-35.695	-17.812	***
Mean dependent var		62.265	SD dependent var			14.731	
R-squared		0.193	Number of obs			4194	
F-test		62.410	Prob > F			0.000	
Akaike crit. (AIC)		33599.665	Bayesian crit. (BIC)			33707.469	

*** p<.01, ** p<.05, * p<.1

Table 12: Regression with interaction term

4.5   Robustness check

To improve the robustness of the model, the regression is run with robust standard errors to control for heteroscedasticity. Table 11 shows the regression with normal standard errors, and Table 13 shows the results with robust standard errors. The relationships between the dependent variable and the independent variables all remain significant. However, TMT gender heterogeneity falls down to a significance level of p<0.1. To further improve robustness, industry-specific dummies were created and added. Another way the robustness was improved is through the transformation of variables to control for non-normality. PER and firm size were transformed to their logarithmic values, but the other variables did not improve in normality after they were transformed to their logarithmic values. Thus, the use of logarithmic values for PER and firm size improved the robustness of the model.

ESG_combined	Coef.	St.Err.	t-value	p-value	[95% Conf	Interval]	Sig
GenderHet	-3.595	1.968	-1.83	.068	-7.455	.264	*
EducHet	-13.763	1.811	-7.60	0	-17.312	-10.213	***
TenureHet	7.336	3.283	2.23	.025	.9	13.773	**
lnPER	.503	.217	2.32	.02	.078	.928	**
Leverage	.011	.013	0.90	.367	-.013	.036	
Size	3.347	.17	19.74	0	3.015	3.68	***
HighEduc	-.208	.584	-0.36	.721	-1.354	.937	
Agri	-6.732	2.877	-2.34	.019	-12.372	-1.091	**
Constr	2.062	1.131	1.82	.068	-.155	4.278	*
Manu	12.655	.58	21.81	0	11.517	13.792	***
TCEGS	11.444	.83	13.79	0	9.817	13.072	***
WStrade	13.207	.629	20.99	0	11.973	14.441	***
Rtrade	19.329	1.165	16.59	0	17.045	21.612	***
FIR	12.263	.562	21.84	0	11.162	13.364	***
Ser	4.459	.895	4.98	0	2.705	6.214	***
Constant	16.866	2.762	6.11	0	11.451	22.281	***

Mean dependent var		62.265	SD dependent var		14.731
R-squared		0.164	Number of obs		4194
F-test		80.550	Prob > F		0.000
Akaike crit. (AIC)		33744.320	Bayesian crit. (BIC)		33845.782

*** p<.01, ** p<.05, * p<.1

Table 13: Regression with robust standard error

5   Conclusion

The purpose of this study is to investigate the relationship between heterogeneity in TMT characteristics and CSR performance. Specifically, the relationship between TMT tenure heterogeneity, TMT educational background heterogeneity, and TMT gender heterogeneity. To investigate this relationship, a linear regression method is used. Through this method, significant relationships between TMT characteristics heterogeneity and ESG combined score. The ESG combined score is a trustworthy measure of CSR performance provided by Refinitiv Eikon. As for TMT tenure heterogeneity and TMT educational background heterogeneity, results were in line with prior literature that TMT tenure heterogeneity increases CSR performance, and TMT educational background heterogeneity decreases CSR performance (Wiersema & Bantel, 1992; Díaz-Fernández, 2014; Carpenter, Geletkanycz, & Sanders, 2004). However, results on TMT gender heterogeneity showed a negative significant relationship. This was not in line with the expectations. A possible explanation could be that women in TMTs decrease CSR decoupling since women are more aware of the needs of stakeholders (Harjoto, Laksmana, & Lee, 2015), and therefore want to provide the stakeholders with accurate information. This could lead to an overall decrease in ESG combined score, explaining the negative relationship. However, when a regression is run with TMT gender heterogeneity and firm size, the relationship changes. This could explain why TMT gender heterogeneity shows a negative relationship in this research.

This paper contributes to previous literature by confirming the Upper-Echelon Theory that cognitive biases of managers in TMTs can change strategic decision making which can influence company performance outcomes (Hambric & Mason, 1984). Prior literature has linked TMT demographic characteristics and TMT demographic characteristics diversity or heterogeneity to organizational outcomes like company performance (Ping, 2007; Cannella, Park, & Lee, 2008; Cannella, Park, & Lee, 2008; Díaz-Fernández, 2014), strategic change (Wiersema & Bantel, 1992; Cho & Hambrick, 2006), and firm risk (Shakil & Abdul Wahab, 2021). This study adds to that literature by investigating the relationship between TMT characteristics heterogeneity and CSR performance. Moreover, the findings of this study help shareholders increase firm performance

and CSR performance by taking the composition of their TMT into account since CSR performance has been linked to firm performance (Chen, Hung, & Wang, 2018).

6   Limitations and future research

This study is one of the first to examine the relationship between TMT characteristics heterogeneity and CSR performance instead of another organizational outcome such as financial performance or strategic change. Therefore, a comparison with prior literature is difficult. Furthermore, ESG combined score is a relatively new measure of CSR performance which also makes comparing with prior literature difficult. Besides ESG combined score being new, ESG combined score is not the only measure for CSR performance. As stated earlier, the definition of CSR and CSR performance varies in the literature. Therefore, a limitation is only focusing on ESG combined score as a measure of CSR performance.

Another limitation is that this study has a selection bias due to the fact that the sample consists of only European countries. In Europe, CSR reporting is still voluntary which means that firms that issued a CSR report, have done so out of their own free will. Thus, firms that did not report their CSR activities, are not selected. This could lead to biased results.

Future research could expand the sample, and investigate how the relationship between TMTs heterogeneity and CSR performance differs. Moreover, the sample of this study consists of only the year 2020. This is due to the limited availability on data of TMTs before 2020. Data of TMTs prior to 2020 mostly led to TMTs with a size of 1 after merging the datasets. This meant that those TMTs would be seen as fully homogeneous, leading to biased results. This research is also limited by its choice of how to calculate heterogeneity. Blau's index of heterogeneity is not the only measure of heterogeneity. Future research could investigate different measurements of heterogeneity to gain new insights into the relationship between TMT characteristics heterogeneity and CSR performance. Moreover, future research can investigate how TMT heterogeneity interacts with other variables in the relation with CSR performance. As the exploratory regression shows that an interaction effect changes how TMT heterogeneity affects CSR performance.

Overall, the findings of this study imply that firms have to take into account the composition of their TMT and their CSR performance. To be precise, TMT tenure heterogeneity is positively related to CSR performance which means that firms could regularly promote new members to the TMT to increase CSR performance. Furthermore, research has shown that CSR performance increases firm performance (Chen, Hung, & Wang, 2018), and TMT heterogeneity positively affects firm performance (Buyl, Boone, Hendriks, & Matthyssens, 2011; Ping, 2007). Thus, this research adds another dimension by linking TMT heterogeneity to CSR performance.

7   References

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8 Appendix

8.1 Overview of companies used

NAME	Freq.	Percent	Cum.
A P MOLLER MAERSK B	92	2.19	2.19
A2A	27	0.64	2.84
AAK	26	0.62	3.46
AALBERTS	3	0.07	3.53
AAREAL BANK	15	0.36	3.89
ABB LTD N	90	2.15	6.03
ABN AMRO BANK	23	0.55	6.58
ABO WIND	8	0.19	6.77
ACADEMEDIA	15	0.36	7.13
ACCELL GROUP	3	0.07	7.20
ACCIONA	46	1.10	8.30
ACCOR	88	2.10	10.40
ACEA	30	0.72	11.11
ACKERMANS & VAN HAAREN	21	0.50	11.61
ACS ACTIV.CONSTR.Y SERV.	21	0.50	12.11
ACTIA GROUP	4	0.10	12.21
ADDLIFE B	3	0.07	12.28
ADDNODE GROUP B	7	0.17	12.45
ADDTECH B	19	0.45	12.90
ADECCO GROUP	60	1.43	14.33
ADESSO	4	0.10	14.43
ADEVINTA	4	0.10	14.52
ADIDAS	43	1.03	15.55
ADLER GROUP	6	0.14	15.69
ADP	69	1.65	17.33
ADVAL TECH N	2	0.05	17.38
ADYEN	12	0.29	17.67
AEGON	38	0.91	18.57
AEROFLOT RUSS.AIRL.	22	0.52	19.10
AEVIS VICTORIA	8	0.19	19.29
AF GRUPPEN 'A'	33	0.79	20.08
AFRY	69	1.65	21.72
AGEAS (EX-FORTIS)	21	0.50	22.22
AGESA HAYAT VE EMEKLILIK A S	13	0.31	22.53
AGRANA BETEILIGUNGS	4	0.10	22.63
AIB GROUP	65	1.55	24.18
AIXTRON	8	0.19	24.37
AKBANK	84	2.00	26.37
AKSA ENERJI URETIM	24	0.57	26.94
AKTIA BANK A	37	0.88	27.83
AKVA GROUP	18	0.43	28.25
AKWEL	3	0.07	28.33
AKZO NOBEL	48	1.14	29.47
ALANDSBANKEN A	22	0.52	30.00
ALBIOMA	25	0.60	30.59
ALD	12	0.29	30.88

ALFA LAVAL	28	0.67	31.55
ALIMAK GROUP	16	0.38	31.93
ALIOR BANK	16	0.38	32.31
ALL FOR ONE GROUP N	3	0.07	32.38
ALLANE	3	0.07	32.45
ALLGEIER N	1	0.02	32.47
ALLIANZ	137	3.27	35.74
ALLIGO B	2	0.05	35.79
ALM BRAND	16	0.38	36.17
ALMA MEDIA	30	0.72	36.89
ALMIRALL	22	0.52	37.41
ALPHA SERVICES AND HOLDINGS	47	1.12	38.53
ALSO HOLDING	20	0.48	39.01
ALSTOM	74	1.76	40.77
ALTEN	9	0.21	40.99
ALTRI SGPS	10	0.24	41.23
ALZCHEM	1	0.02	41.25
AMADEUS FIRE	3	0.07	41.32
AMADEUS IT GROUP	57	1.36	42.68
AMBEA	17	0.41	43.09
AMBU B	5	0.12	43.20
AMPLIFON	24	0.57	43.78
AMS-OSRAM AG	31	0.74	44.52
AMUNDI (WI)	61	1.45	45.97
ANADOLU EFES BIRACILIK LTD.	43	1.03	47.00
ANADOLU GRUBU HOLDING A	16	0.38	47.38
ANADOLU HAYAT EMEKLILIK	8	0.19	47.57
ANDRITZ	7	0.17	47.73
ANHEUSER-BUSCH INBEV	64	1.53	49.26
ANORA GROUP	7	0.17	49.43
APPLUS SERVICIOS TECHNOLOGICOS	25	0.60	50.02
AQ GROUP	14	0.33	50.36
AQUAFIL	8	0.19	50.55
ARBONIA AG	17	0.41	50.95
ARCADIS	50	1.19	52.15
ARCELIK	46	1.10	53.24
ARCELORMITTAL	72	1.72	54.96
ARJO B	12	0.29	55.25
ARKEMA	43	1.03	56.27
ARNOLDO MONDADORI EDI.	31	0.74	57.01
AROUNDTOWN	18	0.43	57.44
ASCOM 'R'	24	0.57	58.01
ASELSAN ELNK.SANVETC.	13	0.31	58.32
ASM INTERNATIONAL	11	0.26	58.58
ASML HOLDING	20	0.48	59.06
ASPO	8	0.19	59.25
ASR NEDERLAND	10	0.24	59.49
ASSA ABLOY B	45	1.07	60.56
ASSECO POLAND	11	0.26	60.82
ASSICURAZIONI GENERALI	90	2.15	62.97
ASTRAZENECA	131	3.12	66.09
ATEA	28	0.67	66.76
ATHENS WATER SUPP.SEWG.	2	0.05	66.81

ATLANTIA	29	0.69	67.50
ATLAS COPCO A	51	1.22	68.72
ATOS	107	2.55	71.27
ATRESMEDIA CORP	22	0.52	71.79
ATRIA 'A'	11	0.26	72.06
ATTENDO	16	0.38	72.44
AUBAY	2	0.05	72.48
AURELIUS SE & CO.KGAA	21	0.50	72.99
AURUBIS	18	0.43	73.41
AUSTEVOLL SEAFOOD	7	0.17	73.58
AUTOGRILL	25	0.60	74.18
AVANZA BANK HOLDING	17	0.41	74.58
AXA	143	3.41	77.99
AXACTOR ASA	23	0.55	78.54
AXFOOD	22	0.52	79.07
AYGAZ	9	0.21	79.28
AZIMUT HOLDING	9	0.21	79.49
B&M EUROPEAN VAL.RET.	2	0.05	79.54
BACHEM HOLDING	8	0.19	79.73
BAKKAFROST	15	0.36	80.09
BALOISE HOLDING	55	1.31	81.40
BAM GROEP KON.	34	0.81	82.21
BANCA GENERALI	44	1.05	83.26
BANCA IFIS	23	0.55	83.81
BANCA MEDIOLANUM	15	0.36	84.17
BANCA PPO.DI SONDRIO	8	0.19	84.36
BANCA TRANSILVAN	7	0.17	84.53
BANCO BPM	19	0.45	84.98
BANCO COMR.PORTUGUES 'R'	23	0.55	85.53
BANCO DE SABADELL	37	0.88	86.41
BANCO SANTANDER	80	1.91	88.32
BANK HANDLOWY W WARSZAWIE	9	0.21	88.53
BANK MILLENNIUM	4	0.10	88.63
BANK OF IRELAND GROUP	60	1.43	90.06
BANK POLSKA KASA OPIEKI	33	0.79	90.84
BANKINTER 'R'	25	0.60	91.44
BANQUE CANTON.DE GENEVE	28	0.67	92.11
BARCO NEW	40	0.95	93.06
BARRY CALLEBAUT	46	1.10	94.16
BASF	131	3.12	97.28
BASIC-FIT	1	0.02	97.31
BASLER	3	0.07	97.38
BAYER	95	2.27	99.64
BAYWA	15	0.36	100.00
Total	4194	100.00	

8.2   Logarithmic values graph inspection for normal distribution
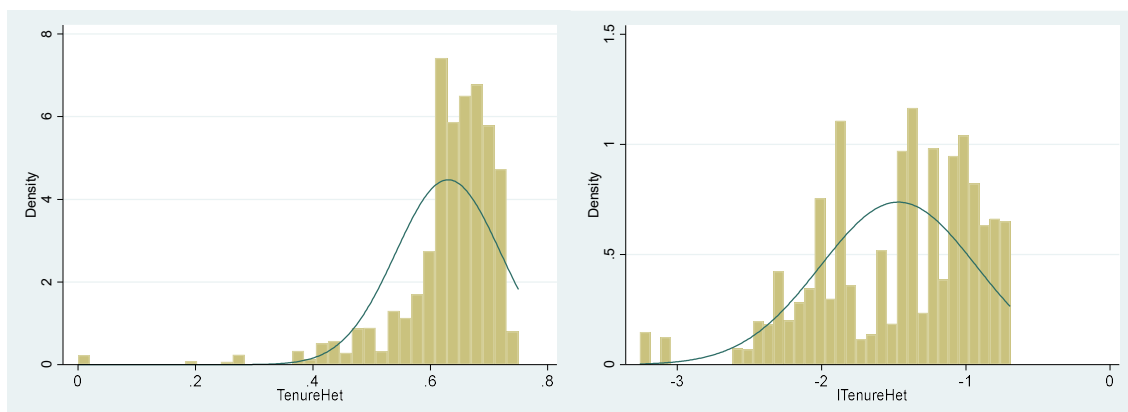
8.2.1   ESG_combined
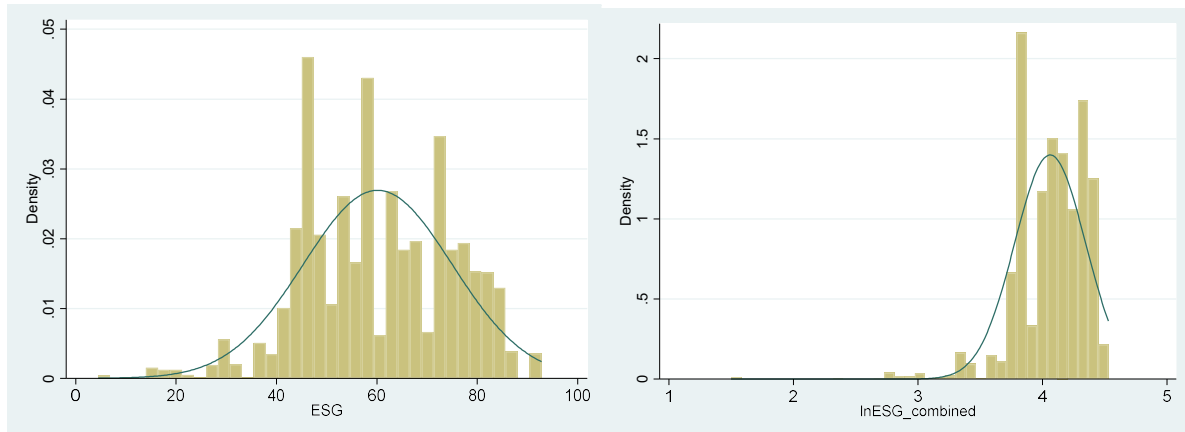
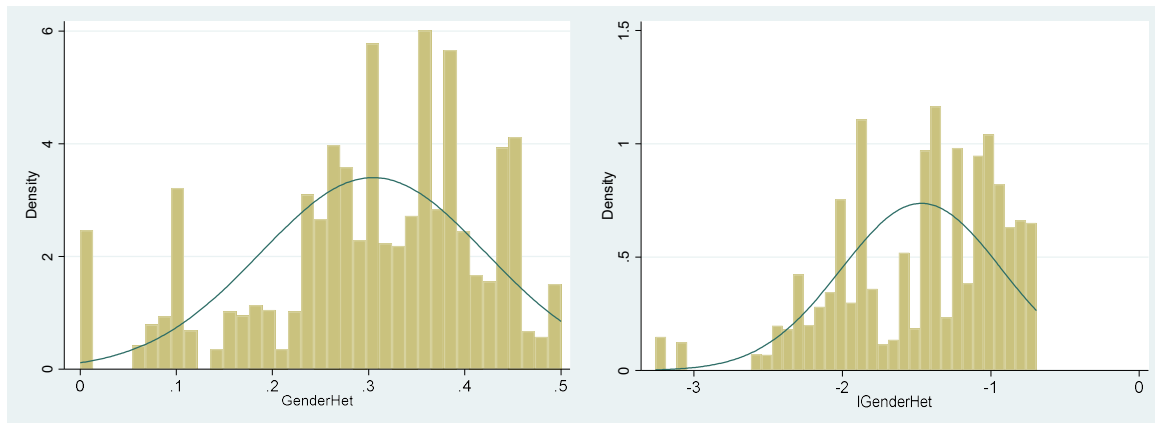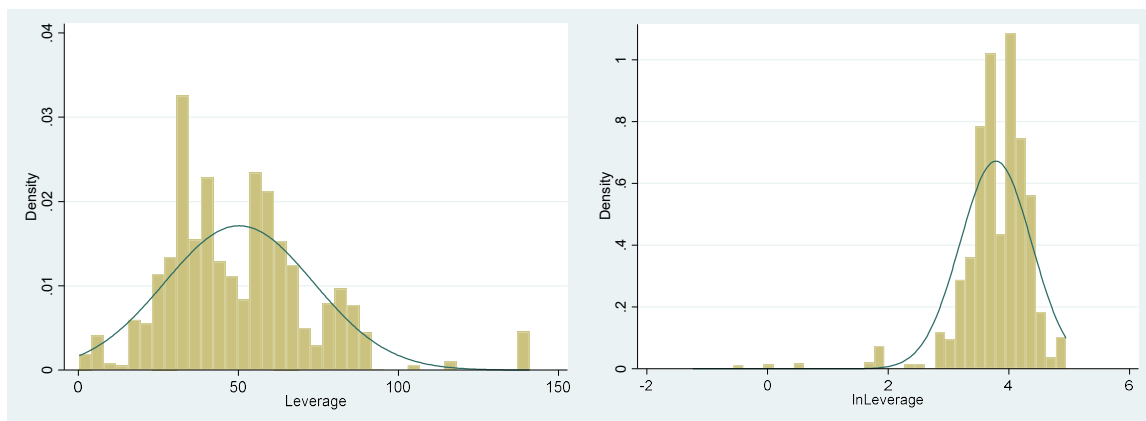## 8.2.2   Education Heterogeneity
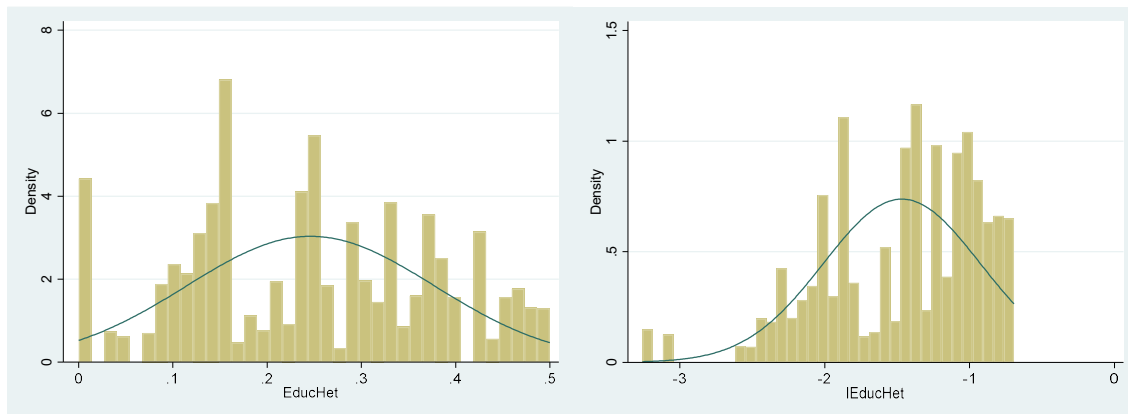
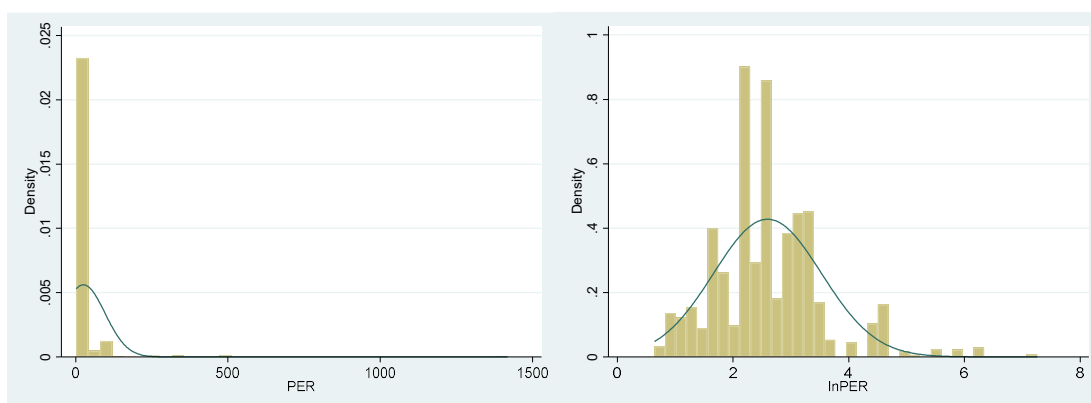## 8.2.3   Tenure Heterogeneity

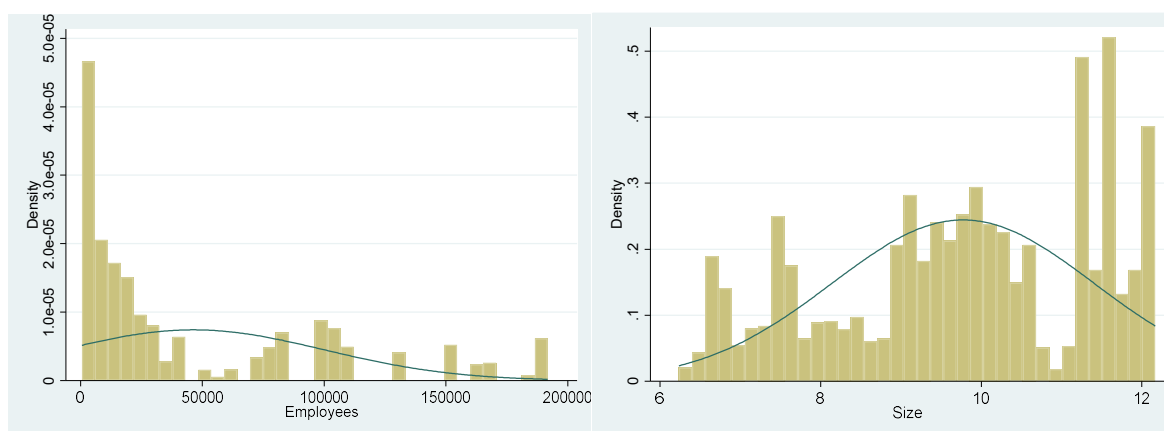

8.2.4   Gender Heterogeneity

8.2.5   Leverage

8.2.6   Price earnings ratio

8.2.7   Size

8.3   Heteroscedasticity

Breusch-Pagan/Cook-Weisberg test for heteroskedasticity

Assumption: Normal error terms

Variable: Fitted values of ESG_combined

H0: Constant variance

chi2(1) = 17.59

Prob > chi2 = 0.0000