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How ESG performance affects the corporate financial performance

An empirical study of the energy sector

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Abstract

This thesis investigates the relationship between environmental, social, and governance (ESG) performance, corporate financial performance (CFP), and firm value by focusing on the energy sector. For this purpose, the study uses a panel dataset comprising of 116 listed firms and 928 firm-year observations during the period 2012 – 2019. The energy sector comprises of two industries and the results indicate that the two industries are affected differently when engaging in ESG. The companies in the oil, gas – and consumable fuels industry is affected positively towards the financial performance, while energy equipment and services are affected negatively. The results from the pillars suggests that the social pillar is affecting financial performance the most, and the governance pillar is second most affecting. However, it is indicated that the pillars also had a negative association to financial performance. When looking at the current study in the context of theories, it is in line with the instrumental stakeholder theory, regarding the relationship between ESG and financial performance. It also found evidence that can relate the current study in the context of the slack resources theory and managerial opportunism hypothesis, when exploring the relationship between financial performance and ESG. The aim of the current research study is to provide a broader perspective on ESG and financial performance, investigate how ESG is reflected in value generation and contribute with important and valuable information which can be beneficial to government, investors and business managers.

Preface

This thesis has been completed as a part of my master's degree in Business and Administration at Oslo Metropolitan University. The main purpose of this research study was to investigate the relationship between environmental, social – and governance (ESG) and financial performance for companies operating in the energy sector. Personally, I have always found sustainability interesting, and this topic is particularly interesting due to climate challenges the world are facing today, and in relation to The United Nations sustainable developmental goals and the Paris agreement.

Writing a master's thesis this semester has been challenging and educational, but especially tough after the outbreak of COVID-19. As most of society was forced to go full lockdown, my daily life was turned upside down. It was challenging for me to stay motivated, as we all had to adjust to constant new demands and restrictions from the government. Nevertheless, this has been a learning process and I am glad I pushed myself to do my best, and that I found the motivation I needed to finish my thesis.

I want to thank my supervisor, Muhammad Azeem Qureshi for his help and constructive feedback during this semester. I would also like to thank friends and family for their support during this process.

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1. Introduction

This thesis explores how environmental, social and governance (ESG) can affect corporate financial performance within the energy sector. Today there is an increasing interest on ESG activities, and the subject is often discussed by government, managers and stakeholders, which makes this study highly relevant.

Over the past few years, we have witnessed extreme weather conditions and other disasters affecting our planet. If we do not do any changes in our behavior toward climate challenges, the worst is yet to come. The energy sector is facing some major challenges. These concerns are related to reduction of emissions, and the concern of ensuring enough energy supply to the population, as the increased demand for energy is growing in line with the world population (Costa-Campi, Duch-Brown, & García-Quevedo, 2014) According to McKinsey (2019) will this sector will play an important role in the future in relation to how we heat our house and how we provide energy to other industries. Companies operating in this sector are often mentioned in the media and are often referred to as the "bad guys" when it comes to Co2-emssions and operations that have a negative impact towards climate challenges. Deepwater Horizon drilling rig explosion is considered to be the largest oil spill accident in petroleum history and this accident caused great damage to the marine environment (Mohit, 2020). In the beginning of 2018, Norwegian Hydro received a lot of attention when a report confirmed that the emission was more serious than first assumed and it was confirmed that illegally high values of different metals were found in the environment of students living in the area. These metal originated form the accident (E24, 2018). Even though there have been some serious incidents in the past years, companies within this sector are considered as forerunners on reporting their environmental and social disclosure. One the other hand, a report from GEA (2012) pointed out that these companies also need to engage more to meet climate challenges by investing more in research, and development and innovation. This is necessary since the level of R&D and innovation are low in within the energy sector. Although this sector is facing its own operational and financial risks from climate change, they also have the opportunity to be leaders in lowering carbon emissions (KPMG, 2019).

Previous studies have shown that engaging in non-financial reporting can add positive value to a firm's financial performance. Most of these studies have been looking at multiple industries, rather than focusing at one. As stated by Soana (2011) the impact on financial performance can differ from one industry to another. Some studies have been looking at the

relevance of ESG and corporate financial performance within the energy sector, but most of these studies have only been done in so-called emerging countries. As several research studies have found a positive association between ESG and financial performance, there is still few studies which have studied the reversed relationship. The current study contributes to existing research on ESG and financial performance by reviewing how financial performance affects ESG, and how ESG affects financial performance. It also provides a deeper understanding by decomposing ESG to study the effect of each pillar. The motivation behind writing this master thesis is to get a broader insight on companies operating within this sector, as they have a great impact on our climate challenges and the way we live. Even though these companies need to meet demands from the government, it is also interesting to see if it will be beneficial for corporations to be more engaged in ESG.

The main research question of this study is formulated as follows:
Does ESG performance affect corporate financial performance for companies within the energy sector?

In addition to the first research question, the study will investigate the partial question investigating if companies that have more frequent attendance on board meetings can add value to a firm's value and performance.

The supplementary question is:
Does board meeting attendance play a role for the company's financial performance?

The thesis is structured as follows; Section one contains the introduction, section two presents the theoretical framework, which includes previous empirical research that is relevant for this study. Section three presents a description of the methodology and data description used for the analysis of the data. Section four presents the results and discussion, whereas section five contains the conclusion, implications for further research and the limitations of the current study.

2. Theoretical framework

After reading through existing research studies on the topic in question, it was found that there has been a limited amount of research done regarding the relationship between ESG and corporate financial performance. Several research studies have investigated the relation between CSR and financial performance, and the linkage between corporate governance and financial performance – and firm value.

2.1 Sustainability theory

The world we live in today is facing some major challenges. In the past year we have witnessed large areas of Australia being burnt down, and we have also witnessed extreme weather conditions and other natural disasters. The climate challenges are striking harder and such incidents are expected to occur more frequent in the future (World Economic Forum, 2020). Thus, there has been an increased interest toward these challenges and these issues have been connected to sustainability and corporate responsibility. The Commission on Environment and Development, the Brundtland report defined sustainable development as *"development which meet the need of the present without compromising the ability of future generations to meet their own needs"* (WCED, 1987)

In addition to the global awareness regarding climate challenges, there has also been an increased interest in non-financial reporting. Demands from governments are both forcing and encouraging companies to report what they are doing. It is even an expectation to keep stakeholders well informed through such reports. A CSR report is used to increase the corporations' openness and transparency and it can be used to manage risk and build trust (GRI's reporting 2025 Project May, 2015). Even though companies have increased their reporting on CRS, several studies indicate that reports on CSR can vary between each industry and country (Fortainer, 2011).

Furthermore, Global Reporting Initiative (GRI) is an international non-financial organization that works on sustainable reporting. This organization does also provide guidance to corporations on how they can report their social, economic and environmental impact (GRI, 2014). The Global Reporting Initiative was founded in 1997 and was the first to adopt reporting on sustainability and they offer both a universal standard and more topic-specific

standards, which relates to environmental, social and governance (ESG). The main focus of this organization is to help corporations all over the world to get a better understanding of their particular corporations' impact on issues related to society, human rights, climate change, and governance. This will be beneficial so they can communicate such issues more efficiently.

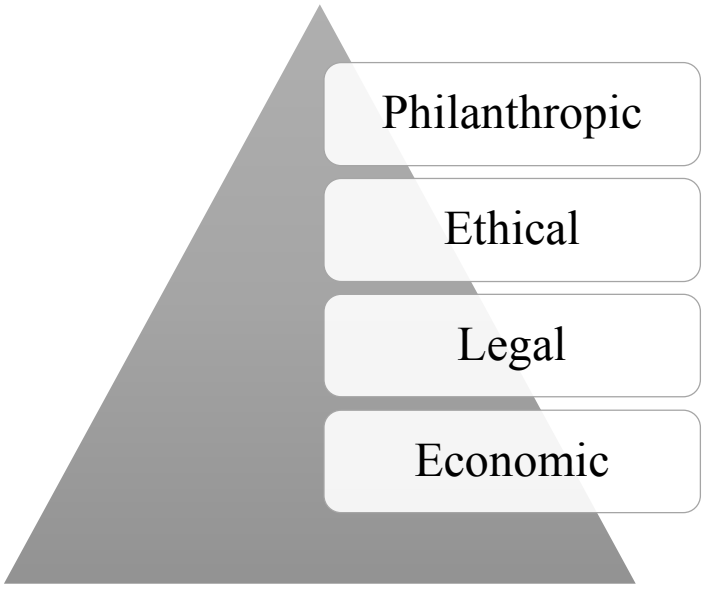
2.1.1 Sustainability in the energy sector

Sustainability in the energy sector is often referred to finding resources that can ensure the access to reliable and affordable energy and have a minimal impact on our environment (Pätäri, Arminen, Tuppura, & Jantuen, 2014). Globally, companies operating within this sector can no longer only focus on creating value for its shareholder, but they need to be responsible and profitable at the same time. Moreover, the government demands new standards and new guidelines for companies in this industry (Streimikiene, Simanaviciene, & Kovaliov, 2009). Even though the topic has been discussed over the past decades and it has been discussed in many empirical research studies, there is still an ongoing debate on the relationship between CSR and financial performance. It has also been discussed that the CSR strengths and concerns have a different impact on a firm's financial performance within the energy sector than in other type of industries. According to Mezher, Tabbara & Al-Hosany (2010) newly established companies are more likely to be tied to CSR and sustainability.

2.2 Corporate social responsibility

Corporate social responsibility, also known as CSR – has several definitions, but are described by the commission of the European communities (2001) p.7. as *"whereby companies integrate social and environmental concerns in their business operation and in their interaction with their stakeholder on a voluntary basis"*. Professor Emeritus Archie B. Carroll is well known for the pyramid of CSR (1991) and divided corporate social responsibility into four different pillars; philanthropic, ethical legal and economic responsibilities.

Figure 1. The pyramid of CSR



Note: The pyramid of CSR. Source: Carroll (1991).

The philanthropic pillar refers to expectations from society that a firm will give some of its recourses to the community (Carroll, 1991 p. 42). The ethical responsibility pillar refers to doing what is right and being fair, which exceeds what is to expect under legal responsibilities and includes values and norms (Carroll, 1991 p. 41). The legal responsibility pillar is an expectation to manage the corporation in a way which is consistent with the government and the legal system (Carroll, 1991 p. 40). Last responsibility, the economic pillar refers to a business 'core'. This pillars aim to make sure that the corporation is consistent with operating efficiently, being profitable and to seek to maintain a strong position in the market in which the corporations are operating in (Carroll, 1991 p.40).

In early contributions, the stakeholder theory stated that the responsibility of a company is to maximize stakeholders value. Friedman (1970) is well known for being one of the opponents of CSR. He argued that activities related to environmental or social responsibility would cost more than its financial benefits, and that neither firms or leaders can be held responsible. In addition, he states that by being engaged in charity, would be immoral to the firm and its owners because it involves the use of the owner's and the stakeholder's money (Friedman, 1970). On the other hand, the shareholder theory argues that it has a responsibility to all of the stakeholders. According to Freeman (2010), stakeholders are described as employees, shareholders, government, customers and suppliers. By engaging in activities with non-

financial creation, it will, in a long term perspective generate value for companies and their stakeholders (Freeman, 2010).

Porter and Kramer (2006) introduced a framework for corporations that allowed them to identify both negative and positive effects. In addition to this, several companies have worked a lot on improving their identified social and environmental issues. Porter and Kramer (2006) also argued that these efforts have not been as productive as they should have been. They have argued that one of the reasons why this has occurred is that several of the companies did not know that some of the issues were a part of their business responsibilities. However, the corporations made some changes after the public responded negatively to how they dealt with certain issues. In 1995, Shell received a lot of attention after the decision to dispose the oil rig called Brent Spar, located in the North Sea. Even though Shell got support from scientists, the public response was overwhelming and led to Greenpeace protests, which damaged their reputation badly (Shell, 2008). The protests made Shell realize that they needed to change their approach towards their operations. A study conducted by Caroline Flammer (2013) looked at how the U.S. stock market reacted to announcements related to the environment. Her findings suggested that investors react negatively to the news that is not eco-friendly. Thus, being sustainable seems to be valued by stakeholders and having a good reputation seems to have a positive impact in the long run.

By engaging in CSR and investing in activities in environmental, social and governance – corporations could gain beneficial profits due to lowering reputation risk (Godfrey, Merrill and Hansen, 2009). McWilliams and Siegel (2006) found evidence that a good reputation is highly valued by their consumers and seems to have a positive correlation to economic value. Authors like Waddock and Graves (1997) found a positive relationship between corporate financial performance and CSR and argued that profitable companies have the resources to invest in CSR. Even though most of the previous empirical research confirms a positive relationship between corporate financial performance and CSR, it is still important to establish that this should not be generalized to every industry (Soana, 2011).

2.2.1 Corporate social responsibility within the energy sector

The energy sector is well known for its substantial impact on environmental factors within several areas, but these companies are also seen as one of the leading industries when it comes

to reporting CSR (Frynas, 2009). Although companies within the oil industry are quick to publicize their environmental impact, it still seems to be some doubt of whether companies take CSR seriously due to the massive emission from their production (Frynas, 2009). Despite the associated negativity concerning the environmental issues in relation to energy corporations, it may also have influenced them to engage more in CSR reporting. This could help them to improve their public appearance and can be used as a strategic tool in the long term (Frynas, 2009), which goes hand in hand with Freeman's stakeholder theory. The study by Frynas (2009) found evidence that international companies in this sector tend to be more engaged in sustainable reporting. Overall, the increased focus related to environmental issues, have led to some improvement within the industry. There have been fewer oil spills over the past three decades and there has been a reduction in greenhouse gas emissions (Frynas, 2009).

2.3 Corporate governance

Theories like the agency problem are often related to corporate governance and financial performance. This theory is engaged with the relationship between the principal and the agent. The agency problem arises when agents may behave or act in ways to reach their own goals rather than the principals or act in self-interest (Brealey, Myers & Allen, 2017, p.12). These problems are also known as agency costs, which can arise when for example, that two parts have different goals or if information asymmetry occurs (Noe, Hollenbeck, Gerhart & Wright, 2019, p. 508).

Corporate governance seems to have a different meaning to things, to different authors. Authors like Shleifer and Vishny (1997, p.737) described corporate governance as *"corporate governance deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment"*. With that said, there is a need for all companies to have a well-functioning board structure, and it needs to be clear what the principals expect from the agents – so agency cost does not arise. In 1996, the Cadbury Committee defined good governance as *"the system by which companies are directed and controlled"*. MacMillian, Money, Downing & Hillenbrand (2004) argued that the word 'directed' also could be used as a guideline for the companies, form them to choose which direction they want to go. Moreover, Shleifer and Vishny (1997) also raised questions related to the protection of the shareholders and the corporation's responsibility to prevent agency

concerns from occurring. Previous researches imply that firms with weaker shareholder rights lead to a lower return. Thus, corporations are valued lower, and have an overall poorer operating performance. It is therefore natural to assume that stronger shareholder rights will lead to better operating performance (Gompers, Ishii & Metrick, 2003). Gompers et.al (2003) found further evidence that agency issues are yet to be found in both developing and developed countries. The U.S. has solved these problems by methods like legal protection of minority investors and monitoring senior management by using the board of directors (Gompers et.al, 2003). On the other hand, the boards have the overall responsibility when it comes to monitoring management and shareholders interest. Several authors have argued that external directors who have bad reputations, because of the company's poor performance will monitor actions more cautiously compared to internal directors (see for example Fama 1980; Fama and Jensen, 1983). This is in line with the study conducted by Bhojrah and Sengupra (2003), who found evidence that stronger investor rights can have a negative influence on operating profits, and corporations may not be competitive in the long run.

Friede, Busch and Bassen (2015) conducted a meta-analysis and found that 'governance' represents a high amount in both positive and negative relationships to corporate financial performance. Yermack (1995) studied the board size, and concluded that small boards work more efficiently, and this results in an increased market value. This is consistent with the findings from Guest (2009) who got the same results. Both of these studies provided evidence that large boards suffer from deficient communication and bad decision making. According to the American economist Michael C. Jensen (1993) the board should not have more than eight members, and by keeping it this small it will help to improve their performance. Overall, both of the authors mentioned argue that small boards are positively related to high firm value.

Nikos Vafeas (1999) found that the number of board meetings is related to corporate governance, and states that firms with poor performance will improve their operating performance if board activity increases. However, he also stated that more frequent board meetings are valued less by the market which will lead to a decrease in share price (Vafeas, 1999). Yet, there have been shown that boards with few regular meetings performed poorer compared to boards with a higher frequency of meetings (Francis, Hasan & Wu, 2012a).

2.4 Environmental, socially and governance

Listed companies are now shifting from short-term goals to long-term goals related too environmental, social and governance (ESG). In a study conducted by Jermey Galbreath (2013), it was pointed out that ESG has become an important indicator for non-financial performance, risk management and competence. It is further argued that most of the previous studies only focus on a single dimension (Galbreath, 2013). Others also suggest that there are too many studies focusing on large samples of multiple industries, instead of focusing on one specific industry (Soana, 2011).

Recent studies indicate that good ESG performance could increase and improve a company's financial performance and this can be viewed as a resource to the corporate risk (Zhao, Guo, Yuan, Wu, Li, Zhou, & Kang, 2018). Ali Fatemi, Martin Glaum and Stefanie Kaiser (2017) investigated the effect ESG performance had on firm value. They found evidence which supported that ESG strengths increases the firm value and ESG weakness decreases it. The authors use data compiled by KLD Research and match the available data for all of the U.S. firms from KLD and Bloomberg. Their results also indicate that environmental strengths increase the firm value. However, results concerning social and governance factors tend to decrease with ESG concerns but either governance and social factors seemed to increase its strengths (Fatemi et al., 2017). According to PWC's ESG Pulse 2019 report, there is a gap between corporates and investors on ESG related disclosures. For an investor to understand a company's long term strategy, they need to have access to the right information in the right format. Not all investors are provided with this type of information, regardless of the ESG score are good or bad (PWC's ESG pulse, 2019). Despite the climate challenges we are facing today, the PWC 2018 Annual Corporate Directors Survey laid out that 39% of directors do not think that environmental issues should be a part of their business strategy.

Since companies within the energy industry are likely to reduce operating performance if their only focus is on benefiting shareholders, they should embrace and implement an ESG oriented governance (Ekatah, Samy and Halabi, 2011). Nonetheless, there is an increasing number of companies using and applying ESG into their long term strategies and because of this, the industries and the relationship between sustainability and financial performance are likely to be affected (Pätäri et al., 2014).

2.5 Economic theory

When studying the relationship between corporate financial performance and corporate social responsibility, there are five different theories representing each relationship. The instrumental stakeholder theory represents the corporate social responsibility and the corporate financial performance with a positive association. The trade-off theory examines the same relationship, but implies a negative association. When looking at corporate financial performance and corporate social responsibility, the slack resources theory indicates a positive relation, and the managerial opportunism hypothesis indicates a negative relation. The last theory, which is called the positive/negative synergy hypothesis demonstrates both the positive and negative relation when studying both of the relationships.

When investigating corporate social responsibility and corporate financial performance, the instrumental stakeholder theory and trade-off theory will be implemented. The other two theories will be implemented when looking at corporate financial performance and corporate social responsibility.

2.5.1 Instrumental stakeholder theory vs. trade-off theory

As mentioned earlier in this section, Freeman (2010) argued that being engaged in non-financial activities would benefit both parts, both the company and their shareholders. Back in 1984 he was one of the pioneer to enlighten this area, stakeholder management. In a study conducted by Donaldson and Preston (1995), they argued that the stakeholder theory also would need to focus on the instrumental, descriptive and empirical aspects. The instrumental stakeholder theory was developed from the stakeholder theory and is focusing on the ethics and behavioral science aspects (Jones, 1995). Jones (1995) further argued that trust and supportive relationships between the firm and its stakeholders will reduce and solve agency problem – and transaction cost. Moreover, this theory also made a connection to corporate social responsibility and Jones (1995) stated that *"Certain types of corporate social performance are manifestations of attempts to establish trusting, cooperative firm/stakeholder relationships and should be positively linked to a company's financial performance"*.

The conflicting theory is call the trade-off theory and is associated with a negative relation towards corporate social responsibility and corporate financial performance. This theory supports Friedman's (1970) shareholder theory, and are also supported by other well-known researchers (Aupperle, 1985; Vance, 1975). These researchers believed that being engaged in social responsible activities would lower the financial performance (Preston & O'Bannon, 1997).

2.5.2 Slack resources theory vs. managerial opportunism hypothesis

The slack resources theory is associated with a positive relationship when studying corporate financial performance and corporate social responsibility. Firm's with better financial results (slack resources), have the opportunity to invest in events like environment, community and workforce (Waddock & Graves, 1997). McGuire, Sundgren, & Schneeweis (1988) studied this realtionship. Their conclusion highligths that companies who engaged in such activities would be rewarded with better financial performance, as companies with low social responsibility had a lower ROA.

Tha managerial opportunism hypothesis states that managers tend to have a short-term goal. Whenever a firm does well and the financial perfromance is strong, managers may be tempted to cash in to make profit in short-term and for their own winning (Preston et al., 1997). This theory states a negative relationship between corproate financial performance and corporate social responsibility.

2.6 Previous research

Pätäri, Arminen, Tuppura, & Jantunen (2014) looked at CSR strengths and concerns within the energy sector, and studied the effect on investment in CSR to see if it had an effect on corporate financial performance. The authors investigated 14 different companies from 1991 and 2009, and they used the Granger causality test to study the relationship. The study concluded strengths and concerns in how CSR affect a corporation's financial performance differently and it was also found that is also depends on how the performance is measure due to market value or profitability (Pätäri et al., 2014).

Gonenc and Scholtens (2016) studied the relationship between environmental and financial performance of fossil fuel firms in the time period between 2002-2013. They used an international sample of firms from both in fossil fuel-related and non-fossil fuel-related industries. Their result suggests that fossil fuel firms have a notably higher score on environmental performance than other firms in other sectors. The authors further argue that outperformance on environmental efforts do not impact the overall performance, but it can reduce financial risk (Gonenc et al., 2016). Moreover, financial outperformance will reduce environmental performance.

Yet, there are fewer empirical researches studies which study the linkage between CSR and financial performance within this industry. Pätäri, Jantuen, Kyläheiko, and Sandström (2012) analyzed 210 companies worldwide. They selected two groups of firms; the first group included the largest firms from the global energy sector, where the key of interest where sustainability issues and the second group included energy firms that were included in the Dow Jones Sustainability indexes. The companies in the Dow Jones Sustainability indexes were selected by a systematic corporate sustainability assessment and included only the most sustainable companies worldwide. The purpose was to investigate if the DJSI firms performed better than the firms that were not included in the sustainability index. During the analysis, the authors analyzed financial performance from different perspectives, including traditional profitability measures and market values (Pätäri et al., 2012). Their findings provided evidence of a positive correlation between CSR and financial performance. Thus, firms within DJSI performed better than firms in the other group of energy companies who are not as oriented on sustainability like DJSI firms.

Similarly, Ekatah, Samy and Halabi, (2011) explored the relation activities related to CSR and financial performance due to a case study of Royal Dutch Shell. The authors used data and key performance indicators reported in Royal Dutch Shell Plc's sustainability report and an annual account with a 5-year period. The Royal Dutch Shell was chosen because it is one of the largest companies within the oil sector (Ekatah et al., 2011). They used a technique similar to the method used by Bowman and Haire (1975) but case study approach was used instead. This case study found a positive relationship between CSR and financial performance.

Bohyun Yooun, Jeong Hwan Lee and Ryan Byun (2018) conducted a study on the topic "Does ESG performance enhance firm value?" They studied how the role of CSR played a significant role in an emerging market. Evidence from this study goes hand in hand with previous studies in developed countries. However, they found support in industries operating in environmentally sensitive industries, and that it had a smaller effect on CSR activities than firms not belonging to environmentally sensitive industries. Existing literature on CSR-valuation has often been conducted in developed countries, whereas evidence from developing countries is limited (Yooun, Lee and Byun 2018). The authors highlight that developing countries are paying more attention on to profits and operating efficiency rather than concepts like CSR and non-financial activities. The authors of this study did also find a positive correlation for developing countries, and found that the structure of corporate governance is essential for shaping effects on CSR-valuation.

2.6 Conducting hypotheses

As mentioned above, the purpose of this study is to consider all of the aspects of ESG into account and not only a single dimension of ESG. This would be important to see how the corporate financial performance is affected. In the previous section, I outlined relevant theory and previous empirical research that have studied the relationship between corporate social responsibilities and financial performance, and corporate governance, and how it can affect its firm value and performance.

As stated above, some researchers explored that concepts like corporate governance and CSR should be treated jointly as both concepts which have a mutual influence (Galbreath, 2013; Rosam & Peddle, 2004). Since both concepts are offering different perspectives and topics, they can be used as a strategic management tool and they will therefore merge together (Rosam & Peddle, 2004). Previous research shows that there is a positive relationship between financial performance and CSR, as well as corporate governance and the concept of ESG is closely related, thus, there is an expectation of a positive relationship between ESG and corporate financial performance. Which leads to the first hypothesis.

Hypothesis 1: There is a positive association between sustainability (ESG) disclosure and corporate financial performance.

There has been a body of literature studying the relationship between CSR and financial performance, however the result is not consistent. Theories like the stakeholder theory might expect ESG pillars to be related to lower firm value (Adams 2002; Orlitzy 2013). Krüger (2014) states that negative ESG news has a negative effect on investors. One the other hand, authors like Servaes and Tamayo (2013) found that CSR and firm value are positively correlated for firms with high customer awareness. Hence, their evidence also contends that CSR activities can add value to the firm. Bassen and Kovács (2008) stated that ESG is becoming an essential indicator for firm valuation, and corporate performance is so much more than traditional financial reporting. Due to the mixed results towards CSR and firm value, the second hypothesis is formulated based on Bassen and Kovács statement as mentioned above.

Hypothesis 2: There is a positive association between sustainability (ESG) disclosure and firm value.

As pointed out by Galbreath (2013) and as mentioned earlier in the previous section, ESG has become an important indicator for non-financial reporting and it also gives investors an impression of what corporations are doing to reduce their footprints when it comes to the world's climate change and challenges. By decomposing each of the three pillars of ESG, one will get a better understanding of the characteristics of ESG and it will be possible to see the association between each pillar to CFP. The third hypothesis is formulated as follows:

Hypothesis 3 The three components (E, S, G) of ESG are equally important for firm value and corporate financial performance.

Since this study looks at the overall ESG reporting companies within the energy industry and not only one country, it would be interesting to study if engaging in ESG would affect developed and developing countries differently. The demand for energy is increasing and it will be increasing as the population on earth increases. The need for energy will however also

increase the pressure in both developed and developing countries when it comes to environmental issues. As stated by (Yooun et al., 2018) emerging markets tend to focus on operating efficiency and profit. Based on this, it is expected that developed and developing countries is affected differently by engaging in ESG. This leads to the fourth hypothesis.

Hypothesis 4: ESG score is affecting financial performance and its firm value differently in developing countries than in developed countries.

3. Methodology and data description

As the previous sections provide existing research and outline four hypotheses, this section describes the methodology being used to investigate the relationship between ESG performance, corporate financial performance, and firm value within the energy sector.

3.1 Methodology approach

After going through previous empirical papers, studies looking from an event, case and longitudinal perspective is frequently used. One of the advantages of using longitudinal data, is that allows us to observe data for different time periods (Stock et al., 2015, p. 397). The goal of this thesis is to study the relationship between market-based and accounting-based measures and how ESG is affecting this. This relationship has been studied by the researcher of this thesis over the years 2012 to 2019, and panel data has been used in this process. The current research study used the OLS (ordinary least squares). Another approach which can be used, is the Fama-Macbeth estimator (see. For example; Derwall, 2007). In a study conducted by Georgios Skoulakis (2008) compared both estimations and found evidence that both approaches give reliable results.

The empirical approach is inspired by Derwall (2007) and Waddock & Graves (1997). The difference is that Derwall (2007) uses the Fama-Macbeth approach, but this study uses the OLS approach to study the relation between ESG and corporate financial performance, as Waddock & Graves (1997) did when studying the relation between CSP and corporate financial performance.

3.2 Sample section

The Thomson Reuters Eikon Database follows the global industry classifications standard by MSCI (MSCI, 2018) and reports two industries within the energy sector. The first industry presents the oil, gas – and consumable fuels, which are companies operating in "Exploration & production, refining & marketing and storage & transportation" (MSCI, 2018). Companies operating in energy equipment & services offer "oil & gas equipment and services" (MSCI, 2018). The research study is looking at companies belonging to the energy sector, worldwide. As a starting point, there were around 1900 companies within this sector in the Thomson Reuters Eikon database. Companies that have not been reporting ESG disclosure in the recent

years, are excluded in this research. This thesis had a final sample of 116 companies which gave a total of observations of 928 in eight years. As stated by Soana (2011), a drawback with previous research was the lack of looking at the industry level. Other researches like Barnett (2007) also highlights that by looking at the industry level, this may help to get a better understanding of the CSR concept.

Table 1. Overview of the energy sector

Energy Sector	
Oil, gas – and consumable fuels	**Energy equipment and services**
Exploration & production Refining & marketing Storage & transportation of oil & gas and coal & consumable fuels	Oil & gas equipment and services

Source: MSCI (2018) and Thomson Reuters (2020)

3.3 period of time

The period of time is set to be eight years, looking at data available from 2012 to 2019. One of the reasons for this is due to get a wider research specter with more companies included. The second reason is based on the fact that this research study operates with a balanced dataset. Most of the companies within this sector, does not have a historical performance on ESG disclosure more than one to four years back. Given these limitations, this study will give a broader perspective on how ESG can affect corporate financial performance by looking at the previous eight years back.

3.4 Variables

In the following section, there will be a presentation of the variables. Dependent, independent and control variables are collected from the Thomson Reuters Eikon Database.

3.4.1 Dependent variables

There is a body of previous empirical work on how to measure financial performance. Two approaches can be used; either accounting measurement or market measurement. Both of

these approaches are often used, but captures different aspects. When using accounting measurement, we only look at historical aspects of firm performance. Authors like Waddock & Graves (1997) used this approach to measure the profitability using accounting variables like return on assets and return on equity. Other authors have used a market measurement, which are measures that are looking forward and have their focus on market performance. Using market measures have some advantages (1) minimize the chance for different accounting procedures and the risk for manipulation, (2) present investor's belief on a company's ability to generate future economic earnings (McGuire et al., 1988). In this thesis, both measures will be looked at; accounting-based and market-based. This is done to get a broader view of corporate financial performance.

The dependent variable for the accounting-based measure is the same as the one used by Waddock & Graves (1997), return on assets.

$$ROA = \frac{Net\ profit\ before\ tax}{Total\ assets}$$

For my market-based measurement, Tobin's Q will be used.

$$Tobin'Q = \frac{Market\ value\ of\ the\ firm}{Book\ value\ of\ assets}$$

Tobin's Q has been widely used in previous empirical work to measure financial performance, since it captures both values of tangible and intangible assets (Perfect and Wiles, 1994). However, different estimators have been used instead of Tobin's Q. Perfect and Wiles (1994) studied five different approaches and tested each of these on 62 random sampled firms and compared the results. Their findings argued that the Tobin's Q does not postulate the same results as the other. Yet, they further stated that it can be used to estimate firm value (Perfect and Wiles, 1994). Tobin's Q is used in the current study, as there are several studies which has used this measurement.

3.4.2 Independent variables

As this thesis aims to investigate how ESG disclosure affects corporate financial performance, it will have several independent variables. The first independent variable will be looking at the overall ESG disclosure. Next it will be studying each pillar of ESG (1) environmental (E), (2) social (S) and (3) governance (G).

As ESG is a non-financial performance measure, one problem to sustainable reporting can be the different approaches on how the corporate publish their data. This can make comparison between the corporation difficult (Eccles, 2012). Thus, the current thesis is gathering data from the Thomson Reuters Eikon Database.

Table 2. Overview of ESG categories

ENVIRONMENTAL	SOCIAL	GOVERNANCE
Resource use	Workforce	Management
Emission	Human rights	Shareholders
Innovation	Community	CSR strategy
	Product responsibility	

Note: Table 1 presents the ten main categories included in the ESG score (Thomson Reuters, 2020)

3.4.3 Control variables

As this study is using two dependent variables, there is a need to find the right control variables to include in the models. Control variables are used to improve the robustness of the models. Thus, some of the control variables in the analysis are the same used by Waddock and Graves (1997) and Derwall (2007). Both interactions variables are included in the regression on ROA and Tobin's Q.

Control variables for corporate financial performance

Leverage is included as a substitute for controlling for a firm's risk. Controlling for firm risk can give indications towards activities that potentially can have an impact connected to investment opportunities and for management decisions regarding for example improving labor force activities (Waddock & Graves, 1997). Leverage is calculated by taking total

liabilities divided by total assets, and are expected to have a negative correlation towards ROA. Since this study looks at the energy sector with data collected from the Thomson Reuters Eikon Database, we have two industries to consider. Therefore, controlling for industry will be necessary since both of these industries may be affected in different ways.

Control variables for firm value

As stated by Waddock and Graves (1997), *"smaller firms may not exhibit as many overt socially responsible behaviors as larger firms"*. Previous research also finds evidence that larger and more diversified firms tend to decrease a company's firm value (Lang and Stulz, 1993). Therefore, firm size is highly relevant. To measure the firm size, I used the same approach as Gompers et.al, (2003); taking the natural logarithm of the book value of assets. Earlier studies (e.g. (Konar and Cohen, 2001; Xerfi, 2002) found that expenses related to research and development (R&D) are positively correlated with firm value, and R&D expenses towards technology are seen as a drive to financial performance. Waddock and Graves (1997) also argued that the level of investment differs among industries, and as mentioned in the introduction, the need for R&D investment within the energy sector is critical to meet the world climate challenges. Growth in revenues is measured by taking the (current year's revenue/ last year's revenue – 1) *100.

Control variable – interactions variables

In addition to the control variables as mentioned above, two dummy variables will be used. As hypothesis 4 states *"ESG score is affecting financial performance and its firm value differently in developing countries than in developed countries."*. After creating the dummy variable, an interaction between the independent variables ESG score and each of the three pillars was created. This allowed the researcher to see the differences in developing countries towards their financial performance and firm value.

The next dummy variable was created for the industry. The energy sector consists of more than one industry. The Thomson Reuters Eikon Database has categorized the energy sector into two industries: oil, gas – and consumable fuels and energy equipment & services. The dummy variable equals 1 for oil, gas – and consumable fuels and 0 otherwise. From there, an interaction between ESG score and each of its pillar and dummy variable was created. Being

able to separate these industries, it was possible to get an opportunity to see how each of these industries perform on ESG and how it affects corporate financial performance.

3.5 Regression equations

This study investigates how ESG affects corporate financial performance within the energy sector. To study this consider, the regressions are based on the estimation technique Ordinary Linear Square. Moreover, the study will also look at what kind of effect environmental, social or governance factors have on corporate financial performance. While researching this effect, the hypotheses will be looking at both market and accounting measurements. Dummy variables are included to investigate companies in the oil, gas – and consumable fuel and developing countries.

3.5.1 ESG performance and corporate financial performance: ROA

The first equation (a1) studies the accounting-based measure on corporate financial performance. ROA is used as the dependent variable and ESG is the independent variable. Book value, leverage and attendance are used as control variables. Both book value of assets and leverage are the same used by Waddock & Graves (1997) and Derwall (2007). Attendance refers to board meeting attendance and is included as an extent to the previous research. This is done due to fact that board meeting attendance can have a significant value to understand ROA in one way or another and is expected to be associated positively with ESG score.

$$\text{(a1) } ROA_{it} = \alpha_i + ESG_{it} + BVA_{it} + Leverage_{it} + Attendance_{it} + u_{it}$$

The second equation (a2) is the same as mentioned above, but book value of assets is in this equation replaced with the robustness variable, firm size.

$$\text{(a2) } ROA_{it} = \alpha_i + ESG_{it} + Leverage_{it} + Attendance_{it} + Firmsize_{it} + u_{it}$$

As mentioned earlier there are two industries within this study. In order to separate these industries, a dummy variable for oil, gas – and consumable is included in equation (a3). From there, an interaction variable is made by multiplying the dummy variable with the ESG score.

This will allow the researcher to investigate how the overall ESG disclosure score affects this industry.

$$\text{(a3) } ROA_{it} = \alpha_i + ESG_{it} + BVA_{it} + Leverage_{it} + Attendance_{it} + ESG\_fuel_{it} + u_{it}$$

Equation (a4) uses the same robustness test as equation (a2) by taking out the book value of assets and replacing it with firm size, but this time we also control for industry. The same interaction variable as mention in equation (a3) is used here.

$$\text{(a4) } ROA_{it} = \alpha_i + ESG_{it} + Leverage_{it} + Attendance_{it} + Firmsize_{it} + ESG\_fuel_{it} + u_{it}$$

3.5.2 ESG performance and firm value: Q

These regression equations are using the market-based measurement to study the firm value. As Derwall (2007) control variables in equation (b1) like firm size, growth and return on assets are used. Board meeting attendance is included in addition to see its effect on Q from a long-term perspective.

$$\text{(b1) } Q_{it} = \alpha_i + ESG_{it} + Firmsize_{it} + Growth_{it} + ROA_{it} + Attendance_{it} + u_{it}$$

In equation (b2) research and development expenditure on revenue are included as a robustness test.

$$\text{(b2) } Q_{it} = \alpha_i + ESG_{it} + Firmsize_{it} + Growth_{it} + ROA_{it} + Attendance_{it} + R\&Dexp_{it} + u_{it}$$

The third equation (b3) uses the same variables as in (b1) but also includes the interaction variable to control for industry and see if ESG score varies from industry and how it affects its firm value.

(b3) $$Q_{it} = \alpha_i + ESG_{it} + Firmsize_{it} + Growth_{it} + ROA_{it} + Attendance_{it} + ESG\_fuel_{it} + u_{it}$$

Last, (b4) also includes our interaction variables, but it also contains the robustness check.

(b4) $$Q_{it} = \alpha_i + ESG_{it} + Firmsize_{it} + Growth_{it} + ROA_{it} + Attendance_{it} + R\&Dexp_{it} + ESG\_fuel_{it} + u_{it}$$

3.5.3 Firm value and corporate financial performance: developed/developing countries

In order to test hypothesis four, the countries that are considered as developed and those that are considered as developing/emerging countries has been categorized. To do so the United Nations report 'world economic situation prospects' (2019) had been used. In order to see if ESG score disclosure differs in emerging and developed countries, a dummy variable was created and multiplied with ESG score. With this, is possible to see if ESG in emerging countries has a positive or negative effect on both measurements, ROA and Q. The regression equations are as follow:

(c1) $$ROA_{it} = \alpha_i + ESG_{it} + ESG\_Ctry_{it} + BVA_{it} + Leverage_{it} + Attendance_{it} + u_{it}$$

(c2) $$ROA_{it} = \alpha_i + ESG_{it} + ESG\_Ctry_{it} + Leverage_{it} + Attendance_{it} + Firmsize_{it} + u_{it}$$

(c3) $$Q_{it} = \alpha_i + ESG_{it} + ESG\_Ctry_{it} + Firmsize_{it} + Growth_{it} + ROA_{it} + Attendance_{it} + u_{it}$$

(c4) $$Q_{it} = \alpha_i + ESG_{it} + ESG\_Ctry_{it} + Firmsize_{it} + Growth_{it} + ROA_{it} + Attendance_{it} + u_{it}$$

3.6 R^2 and adjusted R^2 measurement

R^2 and adjusted R^2 have different implications, as R^2 explains how much variations of the dependent variable are explained by the independent variables in the regression (Stock et al., 2015, p.242). One difference between using R^2 and adjusted R^2 is that the value of R^2 increases when adding more variables to the regression, except if the variables are exactly equal zero. However, adjusted R^2 does not necessarily increase by adding more variables (Stock et al., 2015, p.243). How high value R^2 or adjusted R^2 presents, is often used as a measure of how much it explains the variation on the dependent variable. Nevertheless, these measures also need to be analyzed with a critical eye. Having high or low values on both does not necessarily mean that the regression is inappropriate to use, whereas data quality, data availability and economic theory should also be considered when choosing regressors (Stock et al., p.283.)

3.7 Multicollinearity

As multicollinearity can cause problems due to the regression, there is a need to investigate if there is a collinearity problem with the independent variables. In this thesis the variance inflation factor, which is also known as VIF is used. Since we have two dependent variables, the variance inflation factor has been conducted twice. The first test, tests the independent variables being used to see the effect on return on assets (first dependent variable) and the second test tested the independent variables being used on Tobin's Q. The results show a VIF value lesser than 10, which indicates no problems with multicollinearity in our estimation.

3.8 Heteroscedasticity

For a model to be optimal, it is said to be homoscedastic. This means that the variance does not depend on X_i (Stock et al., 2015, p.203). Whenever the variance of the error is not constant, the models is sad to be heteroskedastic. To see if any of the two models suffers from heteroscedasticity, Breusch-Pagan and Whites test in STATA are used. In addition to these two tests, there is also an opportunity to detect heteroscedasticity by looking at the scatter plot and to check if there is any pattern in the estimated residuals against the explanatory variables.

Since this thesis explores both accounting and market measures, the accounting-based model with ROA (return on assets) was first tested. Results from Breusch-Pagan/ Cook-Weisberg test for heteroscedasticity are statistically significant, and indicates that this model suffers from heteroscedasticity and the null hypothesis will therefore be rejected. However, Whites test provide another perspective on this. According to this test, the regression model does not suffer from heteroscedasticity. For the market-based regression model, both the tests of Breusch-Pagan/Cook-Weisberg and Whites test indicates that this model suffers from heteroscedasticity and the null hypothesis should be rejected. The scatter plots give an indication that both regression models suffer from heteroscedasticity.

As the regression model suffers from heteroscedasticity, we cannot rely on the model's results regarding the confidence interval and hypothesis tests (Stock et al., 2015, p.375). One possible solution to deal with heteroscedasticity is to use 'heteroscedasticity-consistent standard error estimates' (Brooks,2014, p.186) also known as the robust standard error. By taking this into account, the regressions standard errors will no longer be a threat to internal validity (Stock et al., 2015, p.375).

3.9 Robustness test

Since most of the variables are the same as used by Waddock & Graves (1997) and Derwall (2007), the same robustness test is used in this study. The robustness test on return on assets is in the first model by using the book value of assets and then replacing it with firm size. Several studies have used total sales as the robustness variable, but since this study is looking at a different sector than previous empirical research studies, firm size are more accurate in this case rather than total sales. To use the robustness test on firm value, another control variable is added; R&D expenditures on revenues.

In addition to this, the Hausman test was also used to see if random or fixed-effects are preferred and whether one of these are best suited for the regression models in this study (Brooks, 2014, p.537). The results from the Hausman test indicates that the fixed-effects is preferred. By using the fixed-effects model, we can control for an unobserved variable that vary from one entity to another, and which also remains constant over time (Stock et al., 2015, p.419).

As mentioned above, fixed-effects are preferred. However, we know from the Whites and Brusch-Pagan/Cook-Weisberg test that our model suffers from heteroscedasticity. Therefore, the Woolridge test has been used for autocorrelation in the panel data, and the results yield that the model for ROA suffer from autocorrelation. The next test being used is the modified Wald test for group-wise heteroscedasticity in the fixed-effects regression model. The result from this test shows that both regression models on ROA and Q suffer from group-wise heteroscedasticity. Thus, the robustness check was performed by using Feasible GLS regression rather than fixed-effects regression. By using this estimation on the regression, we get robust regressions for both autocorrelation and heteroscedasticity (Wooldridge, 2016, p.424).

3.10 Other implications

As mentioned in section 3.1, you can use both OLS and the Fama-Macbeth approach to study the relationship to corporate financial performance. This approach was first made for long time series, but it could be used for panel data by modification (Skolulakis, 2008). Another popular way to investigate the relationship between non-financial and financial performance is to use a portfolio approach.

This study does not take the use of instrumental variables, but there could be a possibility for endogenous variables resulting from omitted variables. If X and the error term (u) are correlated, the coefficients may not show their actual value even if the sample is large. Hence, the OLS estimator will be inconsistent (Stock et al., 2015, p.47). An advantage with the use of instrumental variables is to distinguish variables that are correlated with the error term from the ones that are not (Stock et al., 2015, p.471) To use an instrumental variable, it must satisfy two conditions:

(1) Instrument relevance: $(Z_i, X_i) \neq 0$
(2) Instrument exogeneity: $(Z_i, X_i) = 0$

(Stock et al., 2015, p. 472).

Therefore, another approach can be done like the one by Fatemi, Glaum and Kaiser (2018). They used instrumental variables for potentially endogenous variables on ESG disclosure.

The first instrumental variable is the existence of a CSR committee on the board of directors. Peters and Romi (2014) (cited in Fatemi et al., 2017) argues that the presence of CSR committee do not affect the firm value, but plays an important role regarding disclosure to their greenhouse emission information, and firms with CSR committee are more likely to disclose information on social issues. The second instrumental variables can be the concentration of stock ownership. Previous research has shown a negative relationship between ownership concentration and level of disclosure. Authors like Li, Lou, Wang and Wu (2013); Liao, Luo and Tang (2015); Reverte (2009) (cited in Fatemi et al., 2017) found evidence that firms with more concentrated stock ownership, have a lower level of disclosure. Therefore, with limited shareholders, corporations can hold back information regarding their disclosure, even though this is required by law (Fatemi et al., 2017).

Table 3 Overview of tests

TEST	PURPOSE	RESULTS
The variance inflation factor	Multicollinearity	No multicollinearity
Breusch-Pagan/Cook-Weisberg	Heteroscedasticity	Heteroscedasticity
Whites test	Heteroscedasticity	Heteroscedasticity
Hausman test	Fixed- or random effects	Fixed-effects
Woolridge test	Autocorrelation in panel data	Autocorrelation
The modified Wald test	Group-wise heteroscedasticity in the fixed-effects regression model	Group-wise heteroscedasticity

Note: This table outlines the results of each test being used to investigate whether the data is suffering from heteroscedasticity, multicollinearity, and which panel method is best suited for robustness test.

4. Results and discussion

In this section, there will be a presentation of the results obtained from the different analyses. The first part will contain a presentation on descriptive statistics and the correlation matrix. The second part will include the results and enough information will be provided to answer the hypotheses as described in section two of this thesis, and the main research questions will also be answered; 'How ESG performance affects corporate financial performance in the energy sector' and 'Does board meeting attendance play a role for the company's financial performance?'

4.1 Descriptive statistics and correlation matrix

Table 4 includes the number of observations, mean, median, standard deviation, minimum – and maximum values, kurtosis and skewness. From table 4 the sample of ESG score disclosure has a mean equal to 60.1, whereas the median is 61.3. The minimum and maximum ESG scores differ from 16.28 to 95.27, which indicates a great variation from the best-performing companies to the worst-performing companies. For each of the ESG pillars, the environmental score shows a mean of 61.37, the social score shows a mean of 60.29 and the governance score shows a mean of 58.28. The environmental score has the highest mean – governance has the lowest score.

Table 4. Descriptive statistics

Variable	N	Mean	Median	St. Dev	Min	Max	Kurtosis	Skewness
ESG	928	60.051	61.309	15.73	16.28	95.272	2.545	-.239
Environment	928	61.373	60.417	20.683	13.277	98.291	2.111	-.156
Social	928	60.296	60.965	18.299	10.344	96.262	2.431	-.201
Governance	928	58.29	61.185	22.064	10.029	97.086	2.044	-.292
Return on assets	928	.038	.04	.068	-1.186	.39	120.8	-6.507
Tobin's Q	927	4.94	2.893	5.916	.199	58.081	16.097	3.083

The kurtosis is a measure of the distribution and tells us how thick the tails are (Stock et al., 2015, p.71). Whenever a kurtosis value exceeds over 3, it means that the tails are more abundant than a normal random variable and have a leptokurtic distribution (Stock et al., 2015, p.71). As shown in table 4 all variables have a positive kurtosis. ESG, environment, social and governance are likely to be platykurtic since they all have a value lesser than 3,

which means that they have thinner tails. (Brooks, 2014. p.67). However, both Tobin's Q and Return on assets have high values – return on assets have an extremely high kurtosis value. This can tell us that return on asset is likely to suffer from extreme values, also called an outlier.

Skewness provides a measure to describe how much symmetry differs from a distribution (Stock et al., 2015, p.69). To have a normal distribution, the skewness equals zero. All the variables in table 4 have negative values, except from Tobin's Q, which has skewness equal to 3.08.

Table 5 Correlation matrix: ROA

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) ROA	1.000								
(2) ESG	0.027	1.000							
	(0.404)								
(3) E	0.066*	0.846*	1.000						
	(0.046)	0.000							
(4) S	0.037	0.829*	0.688*	1.000					
	(0.264)	(0.000)	(0.000)						
(5) G	-0.040	0.653*	0.269*	0.253*	1.000				
	(0.224)	(0.000)	(0.000)	(0.000)					
(6) BVA	0.098*	0.436*	0.433*	0.427*	0.154*	1.000			
	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)				
(7) Leverage	-0.136*	-0.173*	-0.273*	-0.195*	0.069*	-0.211*	1.000		
	(0.000)	(0.000)	(0.000)	(0.000)	(0.036)	(0.000)			
(8) Firmsize	0.201*	0.542*	0.596*	0.503*	0.159*	0.738*	-0.387*	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		
(9) Attendance	0.043	0.157*	0.028	0.059	0.282*	0.000	0.076*	-0.120*	1.000
	(0.193)	(0.000)	(0.398)	(0.072)	(0.000)	(0.998)	(0.021)	(0.000)	

Note: Correlation matrix: ROA, ESG, environment, social, governance, book value of assets, debt to assets, revenue and board meeting attendance (%). P-values shown in parentheses. * shows significance at the 5% level

Table 5 presents the correlation matrix on ROA, and shows that the environmental pillar is affecting ROA with value 0.066 and are significant at a five percentage level. ESG and social pillar show a positive score but is insignificant, while the governance pillar is negative with the score 0.040 but is also insignificant. Each pillar to ESG is highly correlated with the overall score which is expected since they all are included in the overall ESG score. Board meeting attendance is significant at a five percentage level on the correlation with ESG, governance pillar and with leverage, whereas the highest correlation is to the governance pillar with a score equal to 0.282.

Table 6. Correlation Matrix: Tobin's Q

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(1) Q	1.000									
(2) ESG	-0.177*	1.000								
	(0.000)									
(3) E	-0.235*	0.846*	1.000							
	(0.000)	(0.000)								
(4) S	-0.201*	0.829*	0.688*	1.000						
	(0.000)	(0.000)	(0.000)							
(5) G	0.025	0.653*	0.269*	0.253*	1.000					
	(0.443)	(0.000)	(0.000)	(0.000)						
(6) Firm size	-0.336*	0.542*	0.596*	0.503*	0.159*	1.000				
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)					
(7) ROA	-0.041	0.027	0.066*	0.037	-0.040	0.201*	1.000			
	(0.217)	(0.404)	(0.046)	(0.264)	(0.224)	(0.000)				
(8) Growth	-0.002	0.004	-0.005	0.051	-0.034	-0.041	-0.022	1.000		
	(0.963)	(0.916)	(0.878)	(0.148)	(0.330)	(0.248)	(0.534)			
(9) RD	-0.134*	0.338*	0.303*	0.324*	0.161*	0.528*	0.046	-0.022	1.000	
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.159)	(0.527)		
(10) Attendance	0.112*	0.157*	0.028	0.059	0.282*	-0.120*	0.043	-0.045	0.056	1.000
	(0.001)	(0.000)	(0.398)	(0.072)	(0.000)	(0.000)	(0.193)	(0.197)	(0.087)	

Note: Correlation matrix: Tobin's Q, ESG, environment, social, governance, firm size, return on assets, growth in revenue, R&D and board meeting attendance (%). P-values are shown in parentheses. * shows significance at the 5% level.

Table 6 shows that environmental, social and corporate governance are highly correlated and positively related to ESG, which is expected as these pillars are included in ESG. The relation between Tobin's Q and ESG are negatively correlated and inconsistent with previous

empirical studies (Derwall, 2007, Russo and Fotus, 1997). The correlation on the environmental score is -0.235 and significant at 5% level. The negative relation between environmental and corporate financial performance is consistent with the result from Karolina Daszynska-Zygadlo, Thomasz Slonski and Bartosz Zawadzki research published in 2016, *"The market value of CSR performance across sectors"*. Further the correlation shows an overall negative correlation on the dependent variable Q (Tobin's Q), except from two variables. The first one is governance (G) with a value that equals to 0.025, although it is insignificant. The second variable, attendance (board meeting attendance) is significant at five percentage level and shows a value of 0.112.

4.2 Results

Table 7 outlines a presentation on the dependent variables, return on assets and Tobin's Q. At this stage there are no control variables included. As shown in model (1) – (4) representing ROA, the environmental pillar is the only variable that is significant on a five percent level and has a value equal to 0.000216. Looking at the same results on Tobin's Q (5) – (8), all the independent variables are statistically significant, except from the governance pillar. From the accounting-based measure, the environment goes from having a positive relationship, to having a negative relationship with the market-based measure (Tobin's Q).

Table 7. Regression on dependent and independent variables

	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) Q	(6) Q	(7) Q	(8) Q
ESG	0.000118				-0.0666***			
	(0.000107)				(0.0135)			
Environment		0.000216**				-0.0671***		
		(0.0000925)				(0.00950)		
Social			0.000136				-0.0650***	
			(0.000102)				(0.0113)	
Government				-0.000123*				0.00676
				(0.0000722)				(0.00929)
Constant	0.0306***	0.0245***	0.0295***	0.0449***	8.939***	9.059***	8.860***	4.546***
	(0.00764)	(0.00713)	(0.00668)	(0.00527)	(0.910)	(0.699)	(0.792)	(0.603)
Observations	928	928	928	928	927	927	927	927
adj. R^2	0.000	0.003	0.000	0.001	0.030	0.054	0.039	0.000
F	1.214	5.443	1.772	2.914	24.52	49.91	33.12	0.529

Note: This table shows the result from the dependent variables and independent variables. Robust standard errors in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

4.2.1 ESG and corporate financial performance

Hypothesis 1: There is a positive association between sustainability (ESG) disclosure and corporate financial performance.

Table 8. ESG relevance for financial performance: ROA

	Model (1)	Model (2)	Model (3)	Model (4)
ESG	-0.000188	-0.000624***	-0.000548***	-0.000843***
	(0.000124)	(0.000213)	(0.000162)	(0.000249)
BVA	0.000000339***		0.000000226***	
	(9.24e-08)		(7.83e-08)	
leverage	-0.00209***	-0.00106	-0.00277***	-0.00166**
	(0.000529)	(0.000825)	(0.000456)	(0.000748)
Attendance	0.000131*	0.000225***	0.000151**	0.000229***
	(0.0000706)	(0.0000871)	(0.0000709)	(0.0000870)
Firm size		0.0111***		0.00969***
		(0.00396)		(0.00373)
ESG_fuel			0.000375***	0.000267***
			(0.000120)	(0.0000856)
Constant	0.0483***	-0.0179	0.0552***	-0.00410
	(0.00923)	(0.0284)	(0.00852)	(0.0263)
Observations	927	927	927	927
adj. R^2	0.023	0.059	0.039	0.066
F	16.41	18.23	15.68	15.72

Note: This table reports the results from the OLS regression on return on assets and includes control variables and an interaction variable for ESG score for firms operating in industry "Oil, Gas & Consumable Fuels". All of the financial data are scaled by 1 million. Robust Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

To examine the relationship between the overall ESG disclosure score and corporate financial performance measured by ROA, table 8 provides the empirical results from the regression. Model (1) shows the foundation for the regression. Analyzing the first model, both leverage and book value to assets are significant at one percentage level, and firm size are significant in model (2). Board meeting attendance is significant in both models, but at a ten percentage level in model (1) and at one percentage level in model (2). While the ESG score only remains insignificant in model (1). Leverage is included to control for firm's risk and shows a negative correlation to ROA. The results in model (1) – (2) shows the same results as provided by previous researchers (Waddock & Graves, 1997; Derwall, 2007), however the author of the current study did not expect an insignificant ESG score variable in model (1). Furthermore, the same foundation for the regression is used in model (3) – (4), but as mentioned earlier, this current study is looking at two industries. Therefore, ESG_fuel an interaction variable between ESG score disclosure and companies operating in the oil, gas – and consumable fuels are included. By including the interaction variable, it can be seen that

board meeting attendance is significant at five percentage level in model (3) but at one percentage in model (4) and the ESG variable and ESG_fuel are significant at one percent level. By analyzing the results is can be found that companies operating in oil, gas – and consumable fuels have a positive correlation to the firm's financial performance measured by ROA, which is also what the author of the study expected. Furthermore, the author is aware of the low score on adjusted R^2, but still finds this results reliable and as a contribution to the research literature.

4.2.2 ESG and firm value

Hypothesis 2: There is a positive association between sustainability (ESG) disclosure and firm value.

Table 9. ESG relevance for financial performance: Q

	Model (1)	Model (2)	Model (3)	Model (4)
ESG	-0.00109	-0.00304	-0.0701***	-0.0730***
	(0.0174)	(0.0174)	(0.0180)	(0.0180)
Firm size	-1.206***	-1.213***	-1.393***	-1.403***
	(0.158)	(0.158)	(0.147)	(0.147)
Growth	-0.000288*	-0.000304**	-0.000584***	-0.000606***
	(0.000150)	(0.000145)	(0.000133)	(0.000131)
ROA	2.933	2.818	0.400	0.240
	(2.789)	(2.841)	(2.605)	(2.670)
Attendance	0.0150**	0.0147**	0.0171***	0.0168***
	(0.00601)	(0.00600)	(0.00575)	(0.00575)
RDex		-0.110***		-0.131***
		(0.0373)		(0.0455)
ESG_fuel			0.0775***	0.0783***
			(0.00578)	(0.00582)
Constant	13.74***	13.95***	15.70***	15.98***
	(1.184)	(1.189)	(1.180)	(1.181)
Observations	811	811	811	811
adj. R^2	0.116	0.119	0.219	0.225
F	17.15	15.08	34.75	30.43

Note: This table reports the results from the OLS regression on Tobin's Q and includes control variables and an interaction variable for ESG score for firms operating in industry "Oil, Gas & Consumable Fuels". All financial data is scaled by 1 million. Robust Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

As stated in hypothesis 2, it is of importance to see the relation between ESG disclosure and Q, where Q is used as a proxy for firm value. The control variables are the same as in the study of Derwall (2007) except for board meeting attendance. Like the accounting-based measure, the ESG score is not significant in model (1) – (2). In model (2) and (4) the R&D

expenditures are used as a control variable. The firm size is measured by taking the natural logarithm of total assets. In model (3) – (4) the interaction variable between the ESG score and oil, gas – and consumable fuel is included. When including the interaction variable, companies within oil, gas – and consumable fuels have a positive effect on the company's firm value. ESG_fuel is significant in both models at one percentage level and the same goes for the ESG variable, but with a negative correlation. The growth variable was not expected to be affected negatively. One explanation can be related to the oil crises during the middle of 2014 to the beginning in 2015, since the growth in revenues is measured by (current year's revenues/last year's revenues-1) *100. By looking at the previous revenues, there is an overall similarity whereas almost every company had a big reduction in revenues the mentioned years – including some companies in 2016. The R&D expenditure variable also shows a negative correlation on Q which is inconsistent with previous empirical research (Derwall, 2007; Konar and Cohen, 2001; King and Lenox, 2002; Xerfi, 2002; McWilliams and Siegel, 2000; Griliches, 1979). For instance, McWilliams and Siegel (2000) stated that previous studies often tend to have biased estimates when studying the relationship between financial performance and CSR, where investment in R&D often is excluded from the regressions. Further, they also argued that R&D are known for being an important indicator of corporations' financial performance, and refers to a body of previous research studies demonstrating a positive relation between financial performance and the level of R&D (McWilliams and Siegel, 2000) However, as mentioned earlier in the current study, have several previous research studies been looking at more than one industry/sector. Thus, one need to be caution and not generalize these results to all industries as these results can differ and might lead to biased results. The energy industry is for example not comparable to industries like technology and retail. Within the energy sector there is a need to take into account that these types of investments require wide-tanging and a long-term view, as well as it takes time to be realized and it may also require a change in infrastructure (Lee and Yang, 2018). In all models, board meeting attendance has a positive effect on Q, market-based measurement. In model (1) – (2) it is significant at a five percentage level with coefficients equals 0.0150 and 0.0147 – and 0.0171 and 0.0168 in model (3) – (4).

4.2.3 Environmental, social and governance

Hypothesis 3 The three components (E, S, G) of ESG are equally important for firm value and corporate financial performance.

To test hypothesis three, the goal was to see the relevance of each pillar of ESG performance on both accounting-based and market-based measures. Table 10 highlights the results on the accounting-based measure and the results on market-based measure.

In Table 10, model (1) – (4) demonstrates the environmental pillar. The reported results show an overall negative and significant effect on ROA, except in model (2). Model (5) – (8) represent the social pillar, and includes social specters like workforce, human rights and product responsibility on return on assets. The results imply that companies within the oil, gas – and consumable fuels industry are positively affected and significant at one percentage level. Model (9) – (12) represent the governance pillar, which includes how the company runs its management, structure and keeps the shareholder rights in place. The overall score on governance is significant at one percentage level and indicates a negative correlation on ROA. However, when controlling for industry, G_fuel is showing a positive effect on financial performance.

Table 10. Environmental, social and governance relevance for financial performance: ROA

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	ROA	ROA	ROA	ROA	ROA	ROA	ROA	ROA	ROA	ROA	ROA	ROA
Environment	-0.000333**	-0.00000377	-0.000289**	-0.000510***								
	(0.000129)	(0.000108)	(0.000112)	(0.000154)								
Leverage	-0.00123	-0.00203***	-0.00261***	-0.00173**	-0.00115	-0.00207***	-0.00276***	-0.00177**	-0.000923	-0.00193***	-0.00253***	-0.00146*
	(0.000797)	(0.000570)	(0.000506)	(0.000753)	(0.000806)	(0.000516)	(0.000442)	(0.000702)	(0.000838)	(0.000513)	(0.000440)	(0.000774)
Firm size	0.0101***			0.00883**	0.00971**			0.00818**	0.00859***			0.00731**
	(0.00366)			(0.00351)	(0.00396)			(0.00363)	(0.00320)			(0.00302)
Attendance	0.000176**	0.000115*	0.000137**	0.000185**	0.000180**	0.000119*	0.000141**	0.000187**	0.000217***	0.000153**	0.000155**	0.000210***
	(0.0000760)	(0.0000675)	(0.0000677)	(0.0000758)	(0.0000814)	(0.0000699)	(0.0000713)	(0.0000816)	(0.0000798)	(0.0000703)	(0.0000700)	(0.0000797)
BVA		0.000000273***	0.000000168**			0.000000312***	0.000000184**			0.000000312***	0.000000198***	
		(8.04e-08)	(7.27e-08)			(0.000000107)	(8.36e-08)			(9.09e-08)	(7.41e-08)	
E_fuel			0.000322***	0.000229***								
			(0.0000993)	(0.0000728)								
Social					-0.000369*	-0.0000991	-0.000426**	-0.000576**				
					(0.000203)	(0.000123)	(0.000194)	(0.000248)				
S_fuel							0.000374***	0.000266***				
							(0.000134)	(0.0000928)				
Governance									-0.000298***	-0.000198***	-0.000487***	-0.000491***
									(0.0000842)	(0.0000725)	(0.000121)	(0.000120)
G_fuel											0.000344***	0.000241***
											(0.000115)	(0.0000862)
Constant	-0.0240	0.0383***	0.0426***	-0.0129	-0.0199	0.0437***	0.0488***	-0.00583	-0.0186	0.0471***	0.0518***	-0.00581
	(0.0301)	(0.0104)	(0.00976)	(0.0288)	(0.0283)	(0.00754)	(0.00737)	(0.0255)	(0.0295)	(0.00660)	(0.00598)	(0.0278)
Observations	927	927	927	927	927	927	927	927	927	927	927	927
adj. R^2	0.052	0.022	0.034	0.057	0.052	0.023	0.039	0.060	0.053	0.026	0.039	0.059
F	17.75	15.96	15.44	15.43	17.51	16.00	15.00	15.10	19.88	17.70	16.70	17.30

Note: This table reports the results from the OLS regression on return on assets and includes control variables and an interaction variable for E score for firms operating in industry "Oil, Gas & Consumable Fuels". All financial data is scaled by 1 million. Robust Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Based on two-tailed tests.

The results reported in table 11 imply that companies within the oil, gas – and consumable fuels industry (E_fuel) are positively correlated and significant at one percentage level. These result gives the impression that being aware of the environmental impact is appreciated by the market and valued as a long-term strategy. This result is in line with previous research on environmental impact and issues relating to firm value and corporate financial performance (Derwall, 2007). The social pillar shows a negative correlation towards companies operating in energy equipment and services. Out of the three pillars, governance is the only variable that is significant before controlling for industry. When controlling for industry, governance shifts to a negative correlation at one percentage level and the interaction variable G_fuel indicates a positive relation to governance at one percentage level. The positive correlation on firm value is consistent with previous literature. Even though the governance is significant before controlling for industry, the score seen after the control is more accurate since its significant at one percentage level. The variable board meeting attendance is highly significant in all models at one percentage level, except from model (9) – (12).

Table 11. Environmental, social and governance relevance for financial performance: Q

	(1) Q	(2) Q	(3) Q	(4) Q	(5) Q	(6) Q	(7) Q	(8) Q	(9) Q	(10) Q	(11) Q	(12) Q
Environmental	-0.0158	-0.0177	-0.0688***	-0.0713***								
	(0.0123)	(0.0123)	(0.0123)	(0.0124)								
Firm size	-1.091***	-1.095***	-1.300***	-1.306***	-1.116***	-1.138***	-1.358***	-1.387***	-1.267***	-1.279***	-1.463***	-1.480***
	(0.171)	(0.171)	(0.163)	(0.163)	(0.154)	(0.155)	(0.142)	(0.142)	(0.132)	(0.133)	(0.130)	(0.130)
Growth	-0.000257*	-0.000274*	-0.000527***	-0.000548***	-0.000188	-0.000213	-0.000544***	-0.000579***	-0.000263*	-0.000284**	-0.000544***	-0.000571***
	(0.000150)	(0.000145)	(0.000139)	(0.000137)	(0.000153)	(0.000149)	(0.000140)	(0.000136)	(0.000144)	(0.000141)	(0.000135)	(0.000134)
ROA	2.779	2.673	0.637	0.506	2.716	2.650	0.345	0.236	3.565	3.450	1.092	0.934
	(2.760)	(2.811)	(2.686)	(2.748)	(2.744)	(2.793)	(2.404)	(2.464)	(2.634)	(2.688)	(2.517)	(2.590)
Attendance	0.0160***	0.0156***	0.0187***	0.0183***	0.0161***	0.0156***	0.0186***	0.0180***	0.0102	0.0100	0.00909	0.00893
	(0.00558)	(0.00558)	(0.00539)	(0.00538)	(0.00581)	(0.00580)	(0.00558)	(0.00556)	(0.00633)	(0.00633)	(0.00594)	(0.00594)
RDex		-0.115***		-0.128***		-0.107***		-0.132***		-0.1000***		-0.119***
		(0.0383)		(0.0443)		(0.0363)		(0.0456)		(0.0345)		(0.0420)
E_fuel			0.0693***	0.0698***								
			(0.00550)	(0.00554)								
Social					-0.0165	-0.0158	-0.0771***	-0.0768***				
					(0.0132)	(0.0132)	(0.0136)	(0.0137)				
S_fuel							0.0764***	0.0773***				
							(0.00580)	(0.00583)				
Governance									0.0208**	0.0194*	-0.0448***	-0.0470***
									(0.0104)	(0.0104)	(0.0109)	(0.0109)
G_fuel											0.0750***	0.0756***
											(0.00531)	(0.00533)
Constant	13.71***	13.90***	15.21***	15.44***	13.93***	14.10***	15.84***	16.08***	13.13***	13.34***	15.24***	15.51***
	(1.132)	(1.135)	(1.108)	(1.107)	(1.147)	(1.151)	(1.140)	(1.138)	(1.234)	(1.244)	(1.246)	(1.251)
Observations	811	811	811	811	811	811	811	811	811	811	811	811
adj. R^2	0.118	0.122	0.208	0.213	0.118	0.121	0.221	0.227	0.121	0.124	0.221	0.225
F	17.68	15.62	31.51	27.62	17.59	15.46	32.79	29.10	21.44	18.52	38.37	33.40

Note: This table reports the results from the OLS regression on Tobin's Q and includes control variables and an interaction variable for firms operating in industry "Oil, Gas & Consumable Fuels".
All financial data is scaled by 1 million. Robust Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Based on two-tailed tests.

Out of the three pillars, the social pillar is the one that has the largest impact on financial data in both industries. Oil, gas – and consumable fuels industry equal 0.0764 (table 11, model 7)

before including the robustness test variable R&D expenditures. After adding R&D expenditures, S_fuel increases to 0.0773. One of the reasons for this can be explained by the impact of the social pillar on the workforce and human rights. This sector has previously been criticized due to the lack of security in workplaces. Second, the governance pillar (interaction variable, G_fuel) has a value equal to 0.0750 and 0.0754. Lastly, the environmental pillar equals 0.0693 and 0.698. Although both governance – and environmental also provide positive and significant results in oil, gas – and consumable fuels industry, the environmental pillar has the lowest affection toward financial performance.

4.2.4 Corporate financial performance and firm value: developed and developing countries
Hypothesis 4: ESG score is affecting financial performance and its firm value differently in developing countries than in developed countries.

Table 12. ESG relevance for financial performance: companies in developing/developed countries

	(1) ROA	(2) ROA	(3) Q	(4) Q	(5) ROA	(6) ROA	(7) Q	(8) Q
ESG	-0.000192	-0.000592***	-0.00315	-0.00516	0.000124	-0.000376	-0.0183	-0.0206
	(0.000125)	(0.000214)	(0.0174)	(0.0174)	(0.000156)	(0.000230)	(0.0190)	(0.0190)
ESG_etry	0.000316***	0.000216***	-0.0152***	-0.0154***				
	(0.0000767)	(0.0000654)	(0.00413)	(0.00414)				
BVA	0.000000294***				0.000000294***			
	(8.87e-08)				(8.87e-08)			
leverage	-0.00180***	-0.000945			-0.00180***	-0.000945		
	(0.000555)	(0.000825)			(0.000555)	(0.000825)		
Attendance	0.000157**	0.000235***	0.0141**	0.0138**	0.000157**	0.000235***	0.0141**	0.0138**
	(0.0000707)	(0.0000866)	(0.00603)	(0.00603)	(0.0000707)	(0.0000866)	(0.00603)	(0.00603)
Firmsize		0.0102**	-1.137***	-1.143***		0.0102**	-1.137***	-1.143***
		(0.00398)	(0.160)	(0.160)		(0.00398)	(0.160)	(0.160)
Growth			-0.000144	-0.000157			-0.000144	-0.000157
			(0.000155)	(0.000151)			(0.000155)	(0.000151)
ROA			3.388	3.279			3.388	3.279
			(2.673)	(2.721)			(2.673)	(2.721)
RDex				-0.111***				-0.111***
				(0.0376)				(0.0376)
ESG_etry1					-0.000316***	-0.000216***	0.0152***	0.0154***
					(0.0000767)	(0.0000654)	(0.00413)	(0.00414)
Constant	0.0428***	-0.0162	13.53***	13.74***	0.0428***	-0.0162	13.53***	13.74***
	(0.00972)	(0.0285)	(1.173)	(1.178)	(0.00972)	(0.0285)	(1.173)	(1.178)
Observations	927	927	811	811	927	927	811	811
adj. R^2	0.035	0.063	0.119	0.122	0.035	0.063	0.119	0.122
F	17.58	16.62	16.42	14.71	17.58	16.62	16.42	14.71

Note: This table reports the results from the OLS regression on return on assets and Tobin's Q, and includes control variables and an interaction variable for ESG score for firms operating developing countries and an interaction variable for developed countries. All financial data is scaled by 1 million. Robust Standard errors in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Based on two-tailed tests.

As presented in table 12, the first models (1) – (4) represents countries classified as developing countries, and model (4) – (8) represents countries categorized as developed countries. For the developing countries, model (2) and (4) include the robustness test by

including other variables like the previous regression equations, and the same goes for (6) and (8). ESG_ctry (developing) shows a positive correlation on ROA in both models with a value of 0.000316 and 0.000321, and a negative correlation on Q with a value of -0.152 and -0.0154. Model (5) – (8) are presenting developed countries, and they have the opposite effect. Negative effect on ROA and positive effect on Q. All of the other control variables remain the same in both cases. The difference between developing and developed countries can be explained due to the fact that there is a greater chance that companies located in developing countries are in the early stages of engaging in environmental, social and governance activities (Manrique and Ballester, 2017). Countries in the initial phase will benefit from making small changes like recycling and from checking for leaks in their operating production (Manrique et al., 2017). These changes can help such companies to make profits in the short-term and improve their return on assets. Developed countries can be at a more advanced stage of ESG activities and require more resources, such as new technology and production opportunities. The more advanced stage, more capital is needed, which reduces the return on assets but can improve a firm's long-term strategy and their Tobin's Q (Menrique et al., 2017).

4.3 Results from corporate financial performance on ESG

This section provides the results obtained from looking at the reversed relationship, using ESG and each of its pillars as dependent variables and corporate financial performance, ROA and Q as independent variables. The previous analysis demonstrated the relationship by looking at the financial data as ROA and Q as a dependent variable and ESG and each of its pillar as independent variables.

4.3.1 Corporate financial performance and ESG

Hypothesis 1: There is a positive association between sustainability (ESG) disclosure and corporate financial performance.

Table 13 outlines the results on return on assets, where ESG score is used as the dependent variable. When comparing the results in table 8, it is possible to see that the results differ from the two regressions equations. All the control variables are significant in both tables and have the same effect. However, this table demonstrates that our interaction variable for companies

in the oil, gas – and consumable fuels industry is insignificant. The overall ROA in model (2) and (4) illustrate a statistical significant negative correlation towards ESG at one percentage level. The results for corporate financial performance measured by ROA and ESG, is inconsistent with previous research (McGuire et al., 1988).

Table 13. CFP relevance: ROA for ESG

	(1) ESG	(2) ESG	(3) ESG	(4) ESG
ROA	-7.996	-22.97***	-12.82	-23.07***
	(5.957)	(4.685)	(8.496)	(4.961)
BVA	0.000365***		0.000361***	
	(0.0000236)		(0.0000235)	
Leverage	-0.383***	0.107	-0.380***	0.107
	(0.118)	(0.116)	(0.119)	(0.116)
Attendance	0.0853***	0.118***	0.0853***	0.118***
	(0.0147)	(0.0134)	(0.0147)	(0.0134)
Firm size		5.788***		5.787***
		(0.266)		(0.267)
ROA_fuel			14.96	0.301
			(12.72)	(10.86)
Constant	54.56***	9.541***	54.30***	9.545***
	(0.963)	(2.451)	(1.001)	(2.450)
Observations	927	927	927	927
adj. R^2	0.222	0.352	0.222	0.351
F	87.30	146.4	69.30	117.1

Note: This table reports the results from the OLS regression on ESG and includes control variables and an interaction variable for ROA score for firms operating in industry "Oil, Gas & Consumable Fuels". All of the financial data are scaled by 1 million. Robust Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

4.3.2 Firm value and ESG

Hypothesis 2: There is a positive association between sustainability (ESG) disclosure and firm value.

Table 14 highlights corporate financial performance measured by Tobin's Q and ESG. In table 9, the results implied that companies in the oil, gas – and consumable fuels industry are positively affected by ESG and have a positive effect on the market-based measure, Q. Table 14 demonstrates a negative correlation on Q and a positive correlation on our interaction variable Q_fuel as before, however, these results are insignificant in all models in table 14. When looking at the variables firm size and growth in table 9 and 14, they are in table 14 illustrating a positive effect on ESG performance and are highly significant at one percentage level. Board meeting attendance remains positive in both situations and has a positive effect on both ESG performance and corporate financial performance, vice versa.

Table 14. CFP relevance: Q for ESG

	(1) ESG	(2) ESG	(3) ESG	(4) ESG
Q	-0.00552	-0.0154	-0.482	-0.548
	(0.0876)	(0.0875)	(0.421)	(0.421)
Firmsize	5.465***	5.418***	5.372***	5.312***
	(0.281)	(0.281)	(0.295)	(0.296)
Growth	0.00252***	0.00248***	0.00243***	0.00238***
	(0.000389)	(0.000395)	(0.000405)	(0.000413)
ROA	-17.76***	-17.89***	-18.22***	-18.41***
	(4.595)	(4.620)	(4.651)	(4.699)
Attendance	0.120***	0.119***	0.120***	0.119***
	(0.0141)	(0.0141)	(0.0141)	(0.0141)
RDex		-0.219***		-0.229***
		(0.0616)		(0.0652)
Q_fuel			0.454	0.507
			(0.390)	(0.390)
Constant	12.78***	13.29***	13.86***	14.52***
	(2.531)	(2.534)	(2.733)	(2.735)
Observations	811	811	811	811
adj. R^2	0.343	0.345	0.344	0.346
F	98.14	88.23	82.11	75.30

Note: This table reports the results from the OLS regression on ESG and includes control variables and an interaction variable for Q score for firms operating in industry "Oil, Gas & Consumable Fuels". All of the financial data are scaled by 1 million. Robust Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

4.3.3 Corporate financial performance and environmental, social and governance

Hypothesis 3 The three components (E, S, G) of ESG are equally important for firm value and corporate financial performance.

Table 15 highlights the results after breaking down ESG to each of its pillar. The environmental pillar yields the same result as presented in table 13, negative correlation on return on assets. Table 10 provides the same the same regression but in the opposite way. Again, the interaction variable ROA_fuel is insignificant (table 15) in all models except from model (7) which is significant at ten percentage level. However, all models demonstrated a significant relation in table 10.

Table 15. CFP relevance: ROA for each pillar

	(1) Environment	(2) Environment	(3) Environment	(4) Environment	(5) Social	(6) Social	(7) Social	(8) Social	(9) Governanc e	(10) Governanc e	(11) Governanc e	(12) Governanc e
ROA	-0.277	-20.46***	-9.405	-22.64***	-5.898	-20.57***	-13.92*	-24.55***	-19.04**	-28.57***	-15.34	-21.81***
	(7.987)	(6.107)	(12.13)	(7.099)	(6.658)	(6.422)	(7.910)	(6.483)	(9.588)	(9.122)	(9.667)	(7.763)
BVA	0.000451***		0.000442***		0.000412***		0.000404***		0.000216***		0.000219***	
	(0.0000310)		(0.0000308)		(0.0000283)		(0.0000285)		(0.0000343)		(0.0000342)	
Leverage	-0.955***	-0.287**	-0.948***	-0.287**	-0.513***	-0.0424	-0.507***	-0.0432	0.405**	0.720***	0.402**	0.721***
	(0.141)	(0.136)	(0.142)	(0.136)	(0.111)	(0.124)	(0.111)	(0.123)	(0.195)	(0.196)	(0.195)	(0.195)
Attendance	0.0296	0.0724***	0.0295	0.0722***	0.0419**	0.0757***	0.0418**	0.0754***	0.198***	0.218***	0.198***	0.219***
	(0.0195)	(0.0179)	(0.0195)	(0.0179)	(0.0179)	(0.0171)	(0.0180)	(0.0171)	(0.0221)	(0.0216)	(0.0221)	(0.0215)
Firm size		7.596***		7.568***		5.935***		5.885***		3.601***		3.687***
		(0.332)		(0.333)		(0.365)		(0.369)		(0.430)		(0.436)
ROA_fuel			28.31	6.966			24.87*	12.74			-11.46	-21.60
			(17.76)	(14.33)			(14.91)	(13.90)			(18.05)	(17.79)
Constant	59.72***	0.301	59.22***	0.392	56.84***	11.11***	56.41***	11.28***	46.15***	18.01***	46.35***	17.73***
	(1.317)	(3.117)	(1.390)	(3.105)	(1.171)	(3.370)	(1.221)	(3.366)	(1.510)	(3.923)	(1.553)	(3.924)
Observations	927	927	927	927	927	927	927	927	927	927	927	927
adj. R^2	0.221	0.369	0.222	0.369	0.196	0.270	0.198	0.270	0.109	0.138	0.108	0.138
F	84.27	164.1	67.49	130.9	72.78	90.01	58.52	71.66	37.37	43.59	30.58	35.28

Note: This table reports the results from the OLS regression on environmental, social and governance, and includes control variables and an interaction variable for ROA score for firms operating in industry "Oil, Gas & Consumable Fuels". All of the financial data are scaled by 1 million. Robust Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

Table 16 outlines the relationship on corporate financial performance measured by Tobin's Q and each pillar of ESG. As mentioned above, a significant Tobin's Q was not found when using ESG as a dependent variable. However, when decomposing ESG to each pillar, the results changes. The interaction variable Q_fuel is now significant, and is affecting companies in the oil, gas – and consumable fuels industry positively. Whereas the environmental pillar has the highest correlation with a value equal to 1.413 (model 3) and 1.506 (model 4). The results presented below is consistent with the results in table 10. Moreover, all coefficients are significant expect from Q in model (1) -(2) and (5) – (6), as well as the constants in model (1) – (4). Once again board meeting is highly significant at one percentage level and is associated positively with each of the pillars. One of the main changes from table 10 to 16, is the variables firm size, growth and ROA, where firm size and growth has a positive effect and ROA still has a negative effect, but these are now significant.

Table 16. CFP relevance: Q for each pillar

	(1) Environment	(2) Environment	(3) Environment	(4) Environment	(5) Social	(6) Social	(7) Social	(8) Social	(9) Governance	(10) Governance	(11) Governance	(12) Governance
Q	-0.139	-0.156	-1.622***	-1.737***	-0.126	-0.120	-1.450**	-1.422**	0.284*	0.264*	1.916***	1.796***
	(0.109)	(0.109)	(0.611)	(0.609)	(0.0956)	(0.0963)	(0.568)	(0.572)	(0.154)	(0.153)	(0.686)	(0.686)
Firm size	7.505***	7.425***	7.215***	7.109***	5.638***	5.664***	5.379***	5.404***	2.991***	2.895***	3.310***	3.201***
	(0.358)	(0.356)	(0.380)	(0.378)	(0.374)	(0.378)	(0.389)	(0.394)	(0.463)	(0.463)	(0.478)	(0.478)
Growth	0.00212***	0.00205***	0.00185**	0.00175**	0.00616***	0.00618***	0.00591***	0.00593***	-0.00127*	-0.00136*	-0.000964	-0.00107
	(0.000693)	(0.000709)	(0.000741)	(0.000761)	(0.000699)	(0.000694)	(0.000738)	(0.000734)	(0.000750)	(0.000726)	(0.000790)	(0.000764)
ROA	-10.59*	-10.81*	-12.03**	-12.36**	-13.88*	-13.81*	-15.17**	-15.09**	-30.27***	-30.54***	-28.69***	-29.03***
	(6.193)	(6.140)	(5.958)	(5.950)	(7.524)	(7.574)	(6.809)	(6.855)	(11.53)	(11.77)	(10.53)	(10.80)
Attendance	0.0731***	0.0717***	0.0731***	0.0715***	0.0783***	0.0788***	0.0783***	0.0787***	0.221***	0.220***	0.221***	0.220***
	(0.0193)	(0.0193)	(0.0192)	(0.0191)	(0.0179)	(0.0179)	(0.0177)	(0.0178)	(0.0230)	(0.0230)	(0.0228)	(0.0228)
RDex		-0.372***		-0.402***		0.121***		0.0972***		-0.444***		-0.416***
		(0.0812)		(0.0910)		(0.0409)		(0.0359)		(0.145)		(0.135)
Q_fuel			1.413**	1.506***			1.262**	1.240**			-1.556**	-1.460**
			(0.571)	(0.569)			(0.533)	(0.536)			(0.632)	(0.633)
Constant	0.745	1.613	4.115	5.272	14.08***	13.80***	17.09***	16.81***	24.66***	25.70***	20.95***	22.15***
	(3.325)	(3.312)	(3.587)	(3.558)	(3.391)	(3.436)	(3.588)	(3.650)	(4.126)	(4.119)	(4.372)	(4.370)
Observations	811	811	811	811	811	811	811	811	811	811	811	811
adj. R^2	0.357	0.361	0.362	0.366	0.270	0.270	0.275	0.274	0.126	0.130	0.130	0.133
F	113.1	103.3	96.59	88.92	68.61	58.26	58.08	51.29	33.26	30.28	28.50	26.81

Note: This table reports the results from the OLS regression on environmental, social and governance, and includes control variables and an interaction variable for Q score for firms operating in industry "Oil, Gas & Consumable Fuels". All of the financial data are scaled by 1 million. Robust Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

4.3.4 Developed and developing countries: CFP and ESG

Hypothesis 4: ESG score is affecting financial performance and its firm value differently in developing countries than developed countries.

Table 17 investigates whether there are any differences on companies operating in developing – and developed countries. ROA_ctry, the interaction variable includes countries categorized as developing/emerging countries. Model (1) – (4) relates to emerging countries, where model (5) – (8) relates to developed countries. By comparing table 17 to table 12, it is implied that

there are some differences when it comes to looking at corporate financial performance to ESG, and ESG to financial performance. Table 17 demonstrates that financial performance relates negatively to ESG for companies in developing countries at both financial measurement, ROA and Q. Companies in developed countries illustrates that financial performance relates positively to ESG. As stated before, board meeting attendance still has a positive relation to ESG and are significant at one percentage level in all models.

Table 17. CFP relevance: ROA and Q for ESG in developed/developing countries

	(1) ESG	(2) ESG	(3) ESG	(4) ESG	(5) ESG	(6) ESG	(7) ESG	(8) ESG
ROA	-4.583	-16.18***	-17.33***	-17.46***	-27.87**	-65.23***	-17.33***	-17.46***
	(6.037)	(4.586)	(4.598)	(4.622)	(12.44)	(13.70)	(4.598)	(4.622)
ROA_ctry	-23.29*	-49.06***						
	(13.41)	(14.02)						
BVA	0.000367***				0.000367***			
	(0.0000229)				(0.0000229)			
Leverage	-0.408***	0.0680			-0.408***	0.0680		
	(0.120)	(0.118)			(0.120)	(0.118)		
Attendance	0.0832***	0.114***	0.115***	0.114***	0.0832***	0.114***	0.115***	0.114***
	(0.0147)	(0.0133)	(0.0144)	(0.0144)	(0.0147)	(0.0133)	(0.0144)	(0.0144)
Firm size		5.917***	5.542***	5.495***		5.917***	5.542***	5.495***
		(0.259)	(0.279)	(0.280)		(0.259)	(0.279)	(0.280)
Q			-0.00435	-0.0145			-0.720**	-0.740**
			(0.0881)	(0.0880)			(0.331)	(0.331)
Q_ctry			-0.716**	-0.726**				
			(0.325)	(0.326)				
Growth			0.00287***	0.00283***			0.00287***	0.00283***
			(0.000430)	(0.000436)			(0.000430)	(0.000436)
RDex				-0.225***				-0.225***
				(0.0631)				(0.0631)
ROA_ctry1					23.29*	49.06***		
					(13.41)	(14.02)		
Q_ctry1							0.716**	0.726**
							(0.325)	(0.326)
Constant	54.87***	9.161***	12.82***	13.34***	54.87***	9.161***	12.82***	13.34***
	(0.995)	(2.423)	(2.529)	(2.531)	(0.995)	(2.423)	(2.529)	(2.531)
Observations	927	927	811	811	927	927	811	811
adj. R^2	0.223	0.360	0.347	0.349	0.223	0.360	0.347	0.349
F	83.11	133.7	85.68	78.92	83.11	133.7	85.68	78.92

Note: This table reports the results from the OLS regression on ESG and includes control variables and an interaction variable for ROA and Q for firms operating developing countries and an interaction variable for developed countries. All financial data is scaled by 1 million. Robust Standard errors in parentheses. * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Based on two-tailed tests.

4.4 Robustness test

The previous section shows the results obtained from the main regression equations, including the robustness test used by Waddock & Graves (1997) and Derwall (2007). As mentioned in section 3.9, the next robustness test is done by using another panel data approach. The following section shows the results obtained from the feasible GLS regression.

Table 18. Feasible GLS – ESG relevance for financial performance

	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) Q	(6) Q	(7) Q	(8) Q
ESG	-0.000188	-0.000624***	-0.000548***	-0.000843***	-0.00109	-0.00304	-0.0701***	-0.0730***
	(0.000159)	(0.000170)	(0.000181)	(0.000186)	(0.0156)	(0.0156)	(0.0161)	(0.0161)
BVA	0.000000339**		0.000000226					
	(0.000000138)		(0.000000139)					
Leverage	-0.00209***	-0.00106*	-0.00277***	-0.00166***				
	(0.000541)	(0.000559)	(0.000563)	(0.000595)				
Attendance	0.000131*	0.000225***	0.000151**	0.000229***	0.0150**	0.0147**	0.0171***	0.0168***
	(0.0000727)	(0.0000731)	(0.0000723)	(0.0000728)	(0.00663)	(0.00661)	(0.00623)	(0.00620)
Firm size		0.0111***		0.00969***	-1.206***	-1.213***	-1.393***	-1.403***
		(0.00173)		(0.00179)	(0.149)	(0.149)	(0.141)	(0.141)
ESG_fuel			0.000375***	0.000267***			0.0775***	0.0783***
			(0.0000935)	(0.0000939)			(0.00744)	(0.00742)
Growth					-0.000288	-0.000304	-0.000584	-0.000606
					(0.000873)	(0.000871)	(0.000821)	(0.000817)
ROA					2.933	2.818	0.400	0.240
					(2.964)	(2.957)	(2.794)	(2.783)
RDex						-0.110**		-0.131**
						(0.0546)		(0.0512)
Constant	0.0483***	-0.0179	0.0552***	-0.00410	13.74***	13.95***	15.70***	15.98***
	(0.00981)	(0.0134)	(0.00988)	(0.0142)	(1.061)	(1.063)	(1.014)	(1.016)
Observations	927	927	927	927	811	811	811	811
chi2	26.40	62.12	42.92	70.72	112.3	116.9	235.8	244.2

Note: This table reports the results from using GLS estimation on ROA – and Q, and includes control variables and an interaction variable for ESG score for firms operating in oil, gas – and consumable fuels industry. All financial data is scaled by 1 million. Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Based on two-tailed tests

Table 19. Feasible GLS – ESG pillars relevance for financial performance: ROA

	(1) ROA	(2) ROA	(3) ROA	(4) ROA	(5) ROA	(6) ROA	(7) ROA	(8) ROA	(9) ROA	(10) ROA	(11) ROA	(12) ROA
Environment	-0.000333**	-0.00000377	-0.000289**	-0.000510***								
	(0.000132)	(0.000121)	(0.000144)	(0.000149)								
leverage	-0.00123**	-0.00203***	-0.00261***	-0.00173***	-0.00115**	-0.00207***	-0.00276***	-0.00177***	-0.000923	-0.00193***	-0.00253***	-0.00146**
	(0.000562)	(0.000551)	(0.000570)	(0.000592)	(0.000561)	(0.000543)	(0.000564)	(0.000598)	(0.000566)	(0.000540)	(0.000558)	(0.000600)
Firmsize	0.0101***			0.00883***	0.00971***			0.00818***	0.00859***			0.00731***
	(0.00175)			(0.00181)	(0.00165)			(0.00173)	(0.00149)			(0.00156)
Attendance	0.000176**	0.000115	0.000137*	0.000185***	0.000180**	0.000119*	0.000141**	0.000187***	0.000217***	0.000153**	0.000155**	0.000210***
	(0.0000713)	(0.0000716)	(0.0000714)	(0.0000712)	(0.0000714)	(0.0000717)	(0.0000713)	(0.0000712)	(0.0000742)	(0.0000743)	(0.0000738)	(0.0000740)
BVA		0.000000273**	0.000000168			0.000000312**	0.000000184			0.000000312**	0.000000198	
		(0.000000137)	(0.000000139)			(0.000000137)	(0.000000139)			(0.000000127)	(0.000000130)	
E_fuel			0.000322***	0.000229**								
			(0.0000894)	(0.0000895)								
Social					-0.000369***	-0.0000991	-0.000426***	-0.000576***				
					(0.000139)	(0.000135)	(0.000156)	(0.000156)				
S_fuel							0.000374***	0.000266***				
							(0.0000917)	(0.0000930)				
Governance									-0.000298***	-0.000198*	-0.000487***	-0.000491***
									(0.000106)	(0.000106)	(0.000130)	(0.000129)
G_fuel											0.000344***	0.000241***
											(0.0000918)	(0.0000930)
Constant	-0.0240*	0.0383***	0.0426***	-0.0129	-0.0199	0.0437***	0.0488***	-0.00583	-0.0186	0.0471***	0.0518***	-0.00581
	(0.0133)	(0.00861)	(0.00863)	(0.0139)	(0.0134)	(0.00894)	(0.00895)	(0.0142)	(0.0134)	(0.00670)	(0.00677)	(0.0143)
Observations	927	927	927	927	927	927	927	927	927	927	927	927
Chi2	54.63	24.97	38.31	61.58	55.40	25.53	42.60	64.06	56.32	28.57	43.05	63.45

Note: This table reports the results from using GLS estimation on ROA, and includes control variables and an interaction variable for ESG score for firms operating in oil, gas – and consumable fuels industry. All financial data is scaled by 1 million. Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Based on two-tailed tests

Table 20. Feasible GLS – Environment, social and governance: Q

	(1) Q	(2) Q	(3) Q	(4) Q	(5) Q	(6) Q	(7) Q	(8) Q	(9) Q	(10) Q	(11) Q	(12) Q
Environment	-0.0158	-0.0177	-0.0688***	-0.0713***								
	(0.0118)	(0.0118)	(0.0125)	(0.0125)								
Firm size	-1.091***	-1.095***	-1.300***	-1.306***	-1.116***	-1.138***	-1.358***	-1.387***	-1.267***	-1.279***	-1.463***	-1.480***
	(0.152)	(0.152)	(0.146)	(0.145)	(0.143)	(0.143)	(0.136)	(0.136)	(0.125)	(0.124)	(0.119)	(0.119)
Growth	-0.000257	-0.000274	-0.000527	-0.000548	-0.000188	-0.000213	-0.000544	-0.000579	-0.000263	-0.000284	-0.000544	-0.000571
	(0.000872)	(0.000869)	(0.000826)	(0.000823)	(0.000875)	(0.000873)	(0.000822)	(0.000819)	(0.000870)	(0.000868)	(0.000819)	(0.000817)
ROA	2.779	2.673	0.637	0.506	2.716	2.650	0.345	0.236	3.565	3.450	1.092	0.934
	(2.950)	(2.942)	(2.803)	(2.793)	(2.953)	(2.946)	(2.782)	(2.771)	(2.955)	(2.950)	(2.792)	(2.784)
Attendance	0.0160**	0.0156**	0.0187***	0.0183***	0.0161**	0.0156**	0.0186***	0.0180***	0.0102	0.0100	0.00909	0.00893
	(0.00641)	(0.00639)	(0.00607)	(0.00605)	(0.00643)	(0.00642)	(0.00604)	(0.00602)	(0.00669)	(0.00668)	(0.00630)	(0.00628)
RDex		-0.115**		-0.128**		-0.107**		-0.132***		-0.1000*		-0.119**
		(0.0546)		(0.0516)		(0.0544)		(0.0511)		(0.0545)		(0.0513)
E_fuel			0.0693***	0.0698***								
			(0.00719)	(0.00716)								
Social					-0.0165	-0.0158	-0.0771***	-0.0768***				
					(0.0127)	(0.0127)	(0.0133)	(0.0132)				
S_fuel							0.0764***	0.0773***				
							(0.00732)	(0.00730)				
Governance									0.0208**	0.0194**	-0.0448***	-0.0470***
									(0.00948)	(0.00949)	(0.0110)	(0.0110)
G_fuel											0.0750***	0.0756***
											(0.00734)	(0.00732)
Constant	13.71***	13.90***	15.21***	15.44***	13.93***	14.10***	15.84***	16.08***	13.13***	13.34***	15.24***	15.51***
	(1.041)	(1.042)	(0.998)	(0.999)	(1.053)	(1.054)	(1.005)	(1.005)	(1.074)	(1.078)	(1.032)	(1.035)
Observations	811	811	811	811	811	811	811	811	811	811	811	811
Chi2	114.3	119.4	220.4	228.3	114.2	118.6	238.5	247.1	117.7	121.6	237.2	244.2

Note: This table reports the results from using GLS estimation on Q, and includes control variables and an interaction variable for ESG score for firms operating in oil, gas – and consumable fuels industry. All financial data is scaled by 1 million. Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Based on two-tailed tests

Table 21. Feasible GLS – ESG relevance for developing and developed countries

	(1) ROA	(2) ROA	(3) Q	(4) Q	(5) ROA	(6) ROA	(7) Q	(8) Q
ESG	-0.000192	-0.000592***	-0.00315	-0.00516	0.000124	-0.000376*	-0.0183	-0.0206
	(0.000158)	(0.000170)	(0.0156)	(0.0156)	(0.000182)	(0.000200)	(0.0182)	(0.0182)
ESG_etry	0.000316***	0.000216**	-0.0152*	-0.0154*				
	(0.0000925)	(0.0000930)	(0.00833)	(0.00831)				
BVA	0.000000294**				0.000000294**			
	(0.000000138)				(0.000000138)			
Leverage	-0.00180***	-0.000945*			-0.00180***	-0.000945*		
	(0.000545)	(0.000560)			(0.000545)	(0.000560)		
Attendance	0.000157**	0.000235***	0.0141**	0.0138**	0.000157**	0.000235***	0.0141**	0.0138**
	(0.0000726)	(0.0000730)	(0.00663)	(0.00662)	(0.0000726)	(0.0000730)	(0.00663)	(0.00662)
Firmsize		0.0102***	-1.137***	-1.143***		0.0102***	-1.137***	-1.143***
		(0.00177)	(0.154)	(0.153)		(0.00177)	(0.154)	(0.153)
Growth			-0.000144	-0.000157			-0.000144	-0.000157
			(0.000875)	(0.000873)			(0.000875)	(0.000873)
ROA			3.388	3.279			3.388	3.279
			(2.968)	(2.961)			(2.968)	(2.961)
RDex				-0.111**				-0.111**
				(0.0545)				(0.0545)
ESG_etry1					-0.000316***	-0.000216**	0.0152*	0.0154*
					(0.0000925)	(0.0000930)	(0.00833)	(0.00831)
Constant	0.0428***	-0.0162	13.53***	13.74***	0.0428***	-0.0162	13.53***	13.74***
	(0.00988)	(0.0133)	(1.065)	(1.067)	(0.00988)	(0.0133)	(1.065)	(1.067)
Observations	927	927	811	811	927	927	811	811
chi2	38.40	67.89	116.0	120.8	38.40	67.89	116.0	120.8

Note: This table reports the results from using GLS estimation on ROA – and Q, and includes control variables and an interaction variable for ESG score for firms operating developing countries and an interaction variable for developed countries. All financial data is scaled by 1 million. Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Based on two-tailed tests

Table 22. Feasible GLS – CFP relevance for ESG

	(1) ESG	(2) ESG	(3) ESG	(4) ESG	(5) ESG	(6) ESG	(7) ESG	(8) ESG
ROA	-7.996	-22.97***	-12.82	-23.07***	-17.76***	-17.89***	-18.22***	-18.41***
	(6.775)	(6.259)	(7.991)	(7.310)	(6.641)	(6.629)	(6.651)	(6.637)
BVA	0.000365***		0.000361***					
	(0.0000259)		(0.0000262)					
leverage	-0.383***	0.107	-0.380***	0.107				
	(0.112)	(0.107)	(0.112)	(0.107)				
Attendance	0.0853***	0.118***	0.0853***	0.118***	0.120***	0.119***	0.120***	0.119***
	(0.0148)	(0.0136)	(0.0148)	(0.0136)	(0.0143)	(0.0143)	(0.0143)	(0.0143)
Firmsize		5.788***		5.787***	5.465***	5.418***	5.372***	5.312***
		(0.281)		(0.285)	(0.291)	(0.292)	(0.304)	(0.305)
ROA_fuel			14.96	0.301				
			(13.17)	(12.07)				
Q					-0.00552	-0.0154	-0.482	-0.548
					(0.0790)	(0.0790)	(0.452)	(0.453)
Growth					0.00252	0.00248	0.00243	0.00238
					(0.00196)	(0.00196)	(0.00196)	(0.00196)
RDex						-0.219*		-0.229*
						(0.123)		(0.123)
Q_fuel							0.454	0.507
							(0.424)	(0.424)
Constant	54.56***	9.541***	54.30***	9.545***	12.78***	13.29***	13.86***	14.52***
	(1.000)	(2.547)	(1.025)	(2.552)	(2.583)	(2.594)	(2.772)	(2.789)
Observations	927	927	927	927	811	811	811	811
chi2	270.1	509.7	271.8	509.7	431.9	436.8	433.6	438.9

Note: This table reports the results from using GLS estimation on ESG, and includes control variables and an interaction variable for ROA and Q for firms operating in oil, gas – and consumable fuels industry. All financial data is scaled by 1 million. Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Based on two-tailed tests

Table 23. Feasible GLS – CFP relevance: ROA for ESG Pillars

	(1) E	(2) E	(3) E	(4) E	(5) S	(6) S	(7) S	(8) S	(9) G	(10) G	(11) G	(12) G
ROA	-20.46**	-0.277	-9.405	-22.64**	-20.57***	-5.898	-13.92	-24.55***	-28.57***	-19.04*	-15.34	-21.81*
	(8.115)	(8.914)	(10.51)	(9.477)	(7.724)	(8.009)	(9.440)	(9.018)	(10.13)	(10.17)	(12.00)	(11.82)
Leverage	-0.287**	-0.955***	-0.948***	-0.287**	-0.0424	-0.513***	-0.507***	-0.0432	0.720***	0.405**	0.402**	0.721***
	(0.139)	(0.147)	(0.147)	(0.139)	(0.133)	(0.132)	(0.132)	(0.133)	(0.174)	(0.168)	(0.168)	(0.174)
Firm size	7.596***			7.568***	5.935***			5.885***	3.601***			3.687***
	(0.364)			(0.370)	(0.347)			(0.352)	(0.455)			(0.461)
Attendance	0.0724***	0.0296	0.0295	0.0722***	0.0757***	0.0419**	0.0418**	0.0754***	0.218***	0.198***	0.198***	0.219***
	(0.0176)	(0.0194)	(0.0194)	(0.0176)	(0.0167)	(0.0175)	(0.0174)	(0.0167)	(0.0219)	(0.0222)	(0.0222)	(0.0219)
BVA		0.000451***	0.000442***			0.000412***	0.000404***			0.000216***	0.000219***	
		(0.0000341)	(0.0000344)			(0.0000306)	(0.0000309)			(0.0000389)	(0.0000393)	
ROA_fuel			28.31	6.966			24.87	12.74			-11.46	-21.60
			(17.31)	(15.65)			(15.56)	(14.89)			(19.78)	(19.52)
Constant	0.301	59.72***	59.22***	0.392	11.11***	56.84***	56.41***	11.28***	18.01***	46.15***	46.35***	17.73***
	(3.302)	(1.315)	(1.348)	(3.308)	(3.143)	(1.182)	(1.211)	(3.148)	(4.120)	(1.500)	(1.540)	(4.125)
Observations	927	927	927	927	927	927	927	927	927	927	927	927
Chi2	549.4	268.0	271.4	549.8	348.6	231.5	234.7	349.6	152.7	117.8	118.2	154.1

Note: This table reports the results from using GLS estimation on environment, social and governance, and includes control variables and an interaction variable for ROA for firms operating in oil, gas – and consumable fuels industry. All financial data is scaled by 1 million. Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Based on two-tailed tests

Table 24. Feasible GLS – CFP relevance: Q for ESG Pillars

	(1) E	(2) E	(3) E	(4) E	(5) S	(6) S	(7) S	(8) S	(9) G	(10) G	(11) G	(12) G
Q	-0.139	-0.156	-1.622***	-1.737***	-0.126	-0.120	-1.450***	-1.422**	0.284**	0.264**	1.916***	1.796**
	(0.104)	(0.104)	(0.594)	(0.594)	(0.0968)	(0.0970)	(0.552)	(0.554)	(0.129)	(0.129)	(0.738)	(0.739)
Firm size	7.505***	7.425***	7.215***	7.109***	5.638***	5.664***	5.379***	5.404***	2.991***	2.895***	3.310***	3.201***
	(0.384)	(0.385)	(0.400)	(0.400)	(0.357)	(0.358)	(0.371)	(0.373)	(0.477)	(0.478)	(0.496)	(0.498)
Growth	0.00212	0.00205	0.00185	0.00175	0.00616**	0.00618**	0.00591**	0.00593**	-0.00127	-0.00136	-0.000964	-0.00107
	(0.00259)	(0.00258)	(0.00258)	(0.00257)	(0.00240)	(0.00240)	(0.00240)	(0.00240)	(0.00321)	(0.00320)	(0.00320)	(0.00320)
ROA	-10.59	-10.81	-12.03	-12.36	-13.88*	-13.81*	-15.17*	-15.09*	-30.27***	-30.54***	-28.69***	-29.03***
	(8.761)	(8.733)	(8.745)	(8.713)	(8.137)	(8.135)	(8.125)	(8.124)	(10.87)	(10.84)	(10.86)	(10.83)
Attendance	0.0731***	0.0717***	0.0731***	0.0715***	0.0783***	0.0788***	0.0783***	0.0787***	0.221***	0.220***	0.221***	0.220***
	(0.0189)	(0.0189)	(0.0189)	(0.0188)	(0.0176)	(0.0176)	(0.0175)	(0.0175)	(0.0235)	(0.0234)	(0.0234)	(0.0234)
RDex		-0.372**		-0.402**		0.121		0.0972		-0.444**		-0.416**
		(0.162)		(0.162)		(0.151)		(0.151)		(0.201)		(0.201)
Q_fuel			1.413**	1.506***			1.262**	1.240**			-1.556**	-1.460**
			(0.558)	(0.557)			(0.518)	(0.519)			(0.693)	(0.693)
Constant	0.745	1.613	4.115	5.272	14.08***	13.80***	17.09***	16.81***	24.66***	25.70***	20.95***	22.15***
	(3.407)	(3.417)	(3.645)	(3.661)	(3.165)	(3.183)	(3.387)	(3.413)	(4.228)	(4.241)	(4.527)	(4.552)
Observations	811	811	811	811	811	811	811	811	811	811	811	811
Chi2	458.8	467.1	468.9	478.6	307.2	308.1	315.3	315.9	122.3	127.9	128.1	133.1

Note: This table reports the results from using GLS estimation on environment, social and governance, and includes control variables and an interaction variable for Q for firms operating in oil, gas – and consumable fuels industry. All financial data is scaled by 1 million. Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level. Based on two-tailed tests

Table 25. Feasible GLS – CFP relevance: ROA and Q in developed/developing countries

	(1) ESG	(2) ESG	(3) ESG	(4) ESG	(5) ESG	(6) ESG	(7) ESG	(8) ESG
ROA	-4.583	-16.18**	-17.33***	-17.46***	-27.87*	-65.23***	-17.33***	-17.46***
	(7.134)	(6.517)	(6.619)	(6.606)	(14.79)	(13.64)	(6.619)	(6.606)
ROA_ctry	-23.29	-49.06***						
	(15.41)	(14.09)						
BVA	0.000367***				0.000367***			
	(0.0000259)				(0.0000259)			
leverage	-0.408***	0.0680			-0.408***	0.0680		
	(0.113)	(0.107)			(0.113)	(0.107)		
Attendance	0.0832***	0.114***	0.115***	0.114***	0.0832***	0.114***	0.115***	0.114***
	(0.0148)	(0.0135)	(0.0144)	(0.0144)	(0.0148)	(0.0135)	(0.0144)	(0.0144)
Firm size		5.917***	5.542***	5.495***		5.917***	5.542***	5.495***
		(0.282)	(0.292)	(0.293)		(0.282)	(0.292)	(0.293)
Q			-0.00435	-0.0145			-0.720**	-0.740**
			(0.0787)	(0.0787)			(0.303)	(0.303)
Q_ctry			-0.716**	-0.726**				
			(0.293)	(0.293)				
Growth			0.00287	0.00283			0.00287	0.00283
			(0.00196)	(0.00196)			(0.00196)	(0.00196)
RDex				-0.225*				-0.225*
				(0.122)				(0.122)
ROA_ctry1					23.29	49.06***		
					(15.41)	(14.09)		
Q_ctry1							0.716**	0.726**
							(0.293)	(0.293)
Constant	54.87***	9.161***	12.82***	13.34***	54.87***	9.161***	12.82***	13.34***
	(1.020)	(2.533)	(2.573)	(2.584)	(1.020)	(2.533)	(2.573)	(2.584)
Observations	927	927	811	811	927	927	811	811
chi2	273.0	528.4	441.0	446.2	273.0	528.4	441.0	446.2

Note: This table reports the results from using GLS estimation on ESG, and includes control variables and an interaction variable for ROA and Q score for firms operating developing countries and an interaction variable for developed countries. All financial data is scaled by 1 million. Standard errors in parentheses * significant at 10% level, ** significant at 5% level, *** significant at 1% level.

When comparing the results obtained from table 18 – 25 to the results from the main analysis, there are slightly changes to the coefficient values and the significant level. However, these results still provide valid and reliable information. The author can therefore conclude that the results from the main analysis are robust, whereas the significance level and coefficients are approximately the same.

4.5 Main results

Table 26 gives a presentation of the results obtained from the regressions performed above. After conducting the regression analysis, it is found that hypothesis 1 – 3 is partially accepted based on the regression results. After testing both perspectives, corporate financial performance and ESG, and ESG and corporate financial performance, the result yield mixed signals. Hypothesis 4 is accepted as engaging in ESG has different effects in developed and developing countries. Developing countries are affected positively by ESG when measured by ROA and developed countries show the opposite – negative correlation to ROA but a positive correlation on Q, and when studying the other approach, table 17 illustrates different effects in developed – and developing countries.

Table 26. Summary obtained from regressions

Hypothesis		Results
H1	*There is a positive association between sustainability (ESG) disclosure and corporate financial performance*	*Partially accepted*
H2	*There is a positive association between sustainability (ESG) disclosure and firm value*	*Partially accepted*
H3	*The three components (E, S, G) of ESG are equally important for firm value and corporate financial performance*	*Partially accepted*
H4	*ESG score is affecting financial performance and its firm value differently in developing countries than in developed countries*	*Accepted*

Note: This table presents the results on the four hypothesis

Comparing the results from the relationship between ESG and financial performance to economic theory, the trade-off theory will fall within the same framework as described in the shareholder theory. Investing in ESG activities is only a cost to the company and its shareholders. The instrumental stakeholder theory, on the other hand, will be building trust and security between the company and its shareholder, while also addressing aspects such as social and ethics perspectives. Investment in ESG would create value and strengthen this relation, as well as it minimizes agent – and transaction costs. This theory is well reflected in the findings revealed in this study when it comes to companies in the oil, gas – and consumable fuels industry. Although several of these companies are regulated by the state, the results still demonstrate that ESG activities have a positive impact on financial performance, and will generate benefits for the firm and its shareholder. As this industry affects parts, and are necessary for everyone, the increased focus on non-financial activities will also help to create transparency in the overall market.

When looking at the relationship between corporate financial performance and ESG, the results are mixed. Studying the results obtained from ROA, an overall negative impact on the financials can be seen. This is connected to the managerial opportunism hypothesis; managers

tend to care about the short-term profits. With other words, companies with good results may not want to use this profit to invest in ESG activities, but rather use it for their own short-term gain. The results on Q, outlines no significant tests, the relationship can neither be confirmed or not. Managerial opportunism hypothesis can also be related to companies in the oil, gas – and consumable fuels industry in developing/emerging countries. The results imply a negative relation and are consistent with previous research concluding that these countries often tend to only look at making profit. When decomposing ESG into each of its pillar, we can relate the slack resources theory for companies in oil, gas – and consumable fuels industry when studying Q. Both environmental and social aspects are positively related, while governance is negatively related. The positive relationship gives indications that good financial performance results in investment in activities such as labor force, environment and better productions solutions. Unlike in developing countries, the developed countries have a positive relation with ESG. This indicates that good financial results for companies located in this area, seems to be more willing to use its profit to invest and improve their non-financial activities.

5. Conclusion

In this section, there will be a presentation of the conclusion for this study, the limitations with this study, the implications for further research and the policy implications.

5.1 Conclusion

The main purpose of the current study was to investigate and analyze the affect ESG had on corporate financial performance within the energy sector, as well as to see if board meeting attendance plays a role to company's financial performance. This research study also aimed to provide a deeper understanding by decomposing ESG and study the effect of each pillar, and study the relationship between financial performance and ESG in both ways.

This research study concludes that being engaged in ESG can affect companies in a positive and a negative direction in terms of financial performance. As the study addressed, the energy sector operates with two industries, and the result highlights that it would be profitable for companies in the oil, gas – and consumable fuels industry to engage in ESG activities, while companies in energy equipment and services industry are affected negatively. This study used another statistical approach as a robustness test, and the empirical findings remained

approximately the same. There has been an increased interest towards ESG and non-financial reporting in the recent years, and the relationship between corporate social responsibility and financial performance have been studied over the past years. However, little research has been conducted to study the relationship between corporate financial performance and corporate social responsibility. Consequently, this study also addressed this relationship, and the findings outline a negative or non-significant relation to the financial data. However, when decomposing ESG, positive and significant results were found on the market-based measure. Moreover, when reviewing both perspectives, the analysis have a common denominator: board meeting attendance. Board meeting attendance is positively related in both perspectives, and frequent board meetings are seen to be beneficial and as an important indicator for both ESG and financial performance.

5.2 Policy implications

The positive relation between ESG and financial performance and vice versa for companies operating in the oil, gas – and consumable fuels industry, and companies located in developed countries, could be an important indicator for companies operating in developing countries and companies in the energy equipment and services industry. These companies need to reflect over their decisions when it comes to value generation and to shift their focus from short-term profits to long-term goals, and also increase focus on sustainability. This study has demonstrated that it can be beneficial for both parts, companies and stakeholders to engage in ESG, as it generates profits while being sustainable. For these companies, the government and business managers should embrace ESG standard/practice being used in developed countries. The government should provide new standards and guidelines to increase focus on ESG reporting and sustainability. Since research and development within this sector requires large investments, as well as it takes time to be realized, the governments should embrace a reduction toward legal expenses to companies engaging in such activities. Business managers and board members should look at their current business strategy and make sure to implement these activities into the business "core" plan, and to use ESG disclosure as a strategic tool rather than seeing it as a solely cost. Lastly, will increased focus on sustainability increase build trust and transparency in the market which will improve their image and reputation.

5.3 Further research

Further research studies could study how engaging in ESG can affect the stock price for companies within this sector. As most of the previous research done have found that being sustainable has a positive effect on stock price in general, this would be interesting to look at since several companies operating in the energy sector need to meet demands from the government and many of these companies are owned by state-owned companies. These state-owned companies are known to be for example Russia and Saudi Arabia (Frynas, 2009). Another suggestion for further research is to compare companies that are state-owned to companies like Shell and Exxon (Frynas, 2009) – and study their engagement in environmental, social and governance. It could also be suggested in further research to use a different robustness test by comparing ESG disclosure data from the Thomson Reuters Eikon Database and for example Bloomberg's Database to see if there are any differences in the ESG score results and how it affects the financial performance to its company. Lastly, it is worth to mention that there is a lack of previous research studies looking at the relationship between corporate financial performance and ESG. It would be interesting to look at this to see how different industries/sectors is affected.

5.4 Limitations

During this process, I have learned that there are many factors affecting a firm's financial performance and value, when looking at ESG disclosure. Based on that, one limitation of the current study is that more control variables, like for example the firm's age used by Derwall (2007) and the firm's life cycle could be included in the study. Another limitation of the current study is that further throughout this process I also learned that instrumental variables could control for possible endogeneity problems concerning ESG score, firm value and financial performance. Because of the late knowledge to these variables and the lack of enough available data, instrumental variables was not included in this study.

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Appendix

Return on assets

```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of ROA

         chi2(1)      =    19.85
         Prob > chi2  =   0.0000
```

```
White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(20)     =     10.28
         Prob > chi2  =    0.9628
```

Tobin's Q

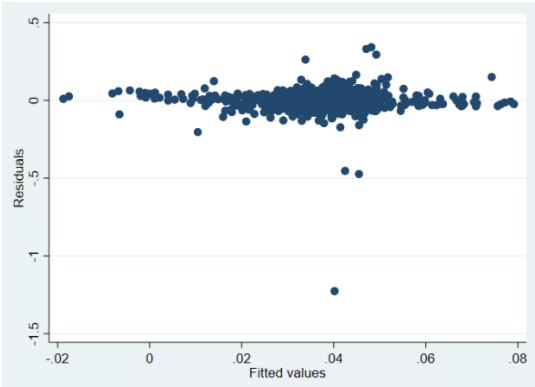
```
Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
         Ho: Constant variance
         Variables: fitted values of Q

         chi2(1)      =   310.65
         Prob > chi2  =   0.0000
```

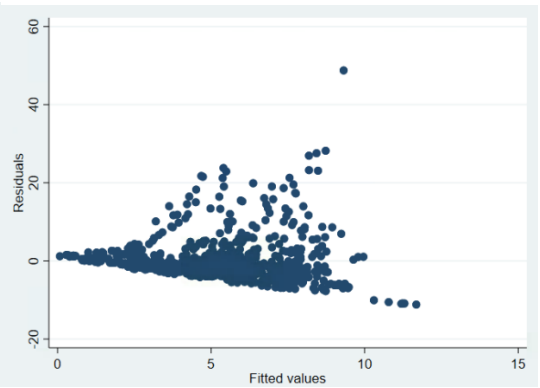
```
White's test for Ho: homoskedasticity
         against Ha: unrestricted heteroskedasticity

         chi2(27)     =     66.56
         Prob > chi2  =    0.0000
```

Scatterplot: Return on assets



Tobin'Q



VIF: Tobin's Q

Variable	VIF	1/VIF
Firmsize	1.58	0.634608
ESG	1.54	0.649999
Attendance	1.11	0.901895
ROA	1.05	0.950348
RDex	1.01	0.989298
Growth	1.01	0.993540
Mean VIF	1.22	

Return on assets

Variable	VIF	1/VIF
ESG	1.29	0.775543
BVA	1.27	0.787726
leverage	1.07	0.938791
Attendance	1.04	0.960116
Mean VIF	1.17	

Variable	VIF	1/VIF
Firmsize	1.71	0.585918
ESG	1.53	0.654629
leverage	1.18	0.847735
Attendance	1.09	0.914872
Mean VIF	1.38	

Return on assets

	Coefficients (b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
ESG	-.0009347	-.0005285	-.0004063	.0002145
BVA	1.52e-06	5.16e-07	1.00e-06	5.69e-07
leverage	-.004295	-.0029774	-.0013176	.0007771
Attendance	.0001824	.0001669	.0000155	.0000524

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 14.62
Prob>chi2 = 0.0056

Tobin's Q

	Coefficients (b) fe	(B) re	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
ESG	-.0433574	-.0207208	-.0226366	.
Firmsize	-4.833616	-3.441344	-1.392272	.1169841
Growth	-.0006512	-.0005969	-.0000543	.
ROA	-1.186741	-1.889009	.702268	.
Attendance	.0039882	.00467	-.0006818	.

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

chi2(5) = (b-B)'[(V_b-V_B)^(-1)](b-B)
= 137.01
Prob>chi2 = 0.0000
(V_b-V_B is not positive definite)

Return on assets:

```
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F(  1,     115) =      7.190
           Prob > F =      0.0084


Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (116)  =  89825.87
Prob>chi2 =      0.0000
```

Tobin's Q:

```
Wooldridge test for autocorrelation in panel data
H0: no first order autocorrelation
    F(  1,     115) =      2.700
           Prob > F =      0.1031
Modified Wald test for groupwise heteroskedasticity
in fixed effect regression model

H0: sigma(i)^2 = sigma^2 for all i

chi2 (116)  =   1.4e+05
Prob>chi2 =      0.0000
```