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Investors Preference and Firms' Reaction

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Abstract

This thesis uses firms from S&P 500 as a sample to measure investors demand for high ESG ratings based on M/B ratios and ESG ratings in the period 2002-2019, and how firms react given that the demand for ESG is high. We use data from Thomson Reuters Eikon and Compustat to extract our variables to compare M/B with ESG and then we run several regressions that tells us if firms raise additional financing when high ESG is in demand. The purpose is to see if investors use ESG as a part of their financial decision making and if firms take advantage of the market momentum. We have defined high ESG as the top 25 percentile of our sample. Results indicate that investors have a preference for high ESG firms, and we find evidence that high rated ESG firms use this to issue additional equity when ESG is in demand, but no significant evidence when it comes to issuing debt.

1. Introduction of research question

As social responsibility and sustainability receive a lot of attention these days, it seems like ESG (Environmental, Social and Governance) will have a greater influence on the finance world in the years to come. Institutional investors and funds are more concerned about the firms measures regarding sustainability, as the population has a growing demand for socially responsible investments, and large institutional investors are pulling out of so-called sin stocks with low ESG ratings (Hong and Kacperczyk 2009). Over the last few years investments based on ESG criteria have significantly increased, and investors and funds are to a greater extent taking ESG performance into account in their investment strategies. In fact, according to a survey made by Morgan Stanley, 84% of investors are at least actively considering integrating ESG criteria into their investment processes (ESG investing 101, 2019).

The purpose of this thesis is to investigate if investors value firms with a high ESG rating differently from firms with a low ESG rating, as the financial world is leaning towards a green transition. We believe investors to a greater extent include ESG ratings in their financial decisions and based on that we measure the demand for ESG by comparing the M/B ratio of high- and low ESG firms. This is important research that can potentially help investors understand new trends in the financial market, especially in the years to come since the use of ESG measures is still in the early stages. Furthermore, we provide useful information about firms' reactions to this demand when it comes to raising additional capital. By looking at the effects of investors preference for good ESG performance, we investigate further to see if firms with a high ESG are more likely to raise additional financing, either by debt or equity, when investors seem to like ESG. Findings by Chen, Goldstein and Jiang (2007) suggests that firms use stock prices to guide managers in making corporate decisions, so we discuss the possibility that high rated ESG firms use this as a way to take advantage of the market momentum by raising equity and debt when investors demand high ESG ratings. This information can be used both by shareholders, debtholders and the firms themselves to analyze how the market react to high ESG, as the firms may take advantage of the market momentum by raising equity and debt.

Since multinational agreements like the Paris Agreement and UN Sustainable Development Goals are in place, and there is an increased focus and pressure on legislators to push for stricter policies regulating corporate social responsibility, many investors believe it is only a matter of time before international regulations will be implemented that can seriously impact the earnings of firms that have yet to adapt to the expected green transition. Since ESG-ratings in many ways are a measure of each firms' efforts in corporate social responsibility, some investors believe this can also be used a measure of how exposed a given firm is to the risk of regulations negatively affecting their operations. High ESG-rated firms might even experience a considerable boost to profitability in the future if regulations affect competitors harder than themselves. Because of this, we expect investors to be willing to pay a premium for ownership in firms with a high ESG-rating compared to firms with a low ESG-rating.

We believe the demand for high ESG-rated firms should also affect the financial decision making of management in these firms. If high ESG-rated firms are less exposed to the risk of future regulations negatively affecting operations or worst-case leading to default, we think this should be reflected in the terms the firms are able to negotiate with lenders, and therefore the amount of debt raised should be positively correlated with the demand for high-ESG firms. When it comes to equity, Baker and Wurgler (2002) found evidence that firms issue equity when the market value is high relative to previous years and repurchase equity when it is low. Based on this we find it reasonable to suspect that high ESG-firms exploit the opportunity to issue equity during periods where the demand for ESG is high.

As our research questions we ask: **Do investors prefer firms with high ESG-ratings? Are high ESG firms more likely to raise additional financing when the demand for ESG is high?**

Our results indicate that investors prefer firms with high ESG-ratings and are willing to pay a premium for this. High rated ESG firms have on average 0,24 higher M/B ratio over the whole sample compared to low rated ESG firms. In percentage, this amounts to 6,15% higher M/B ratio for high rated ESG firms. We also see a trend where high ESG-rated firms' market to book ratios have stabilized at a higher level than low ESG firms since 2017, with three consecutive years

with higher M/B ratio for high rated ESG firms. The average difference in M/B ratio from 2017 to 2019 is 0,56, amounting to a percentage change of 11,5%. This may show that the growth opportunities for high rated ESG firms have increased in that period. These findings are consistent with the Hong & Kacperczyk (2009), who found evidence that high ESG firms receive higher relative valuations.

From our panel regression we see that being a high ESG firm in a year where there is a higher demand for ESG, has a significant positive effect of 12,96% on equity raised, indicating that high rated ESG firms raise additional equity when the demand for ESG is high. We also ran a regression on the change in Equity in dollar terms and found a positive coefficient of 525.39 on a 5% significance level. This is consistent with the findings of Baker & Wurgler (2003) where low-leveraged firms tend to raise funds when their valuation is high. However, the case is not the same for debt, where we find a slightly negative, but statistically insignificant relationship of -1,47%. The key take-away is that there seems to be a shifting trend for the demand for high rated ESG-firms, especially after the Paris Agreement, and that high rated ESG-firms take advantage of this to raise additional equity.

This thesis will proceed with the following sections: Section 2 will provide some background information regarding ESG in existing literature and the impact ESG has on performance and firm value. In section 3 we will discuss ESG and the measures of it. Section 4 will contain the methodology and testable hypothesis of the two different parts of the thesis. We introduce our data collection in section 5. Section 6 contains the descriptive statistics where we describe differences in High-, Mid-, and Low-rated ESG firms. Our results from the demand for ESG-rating and the results from the panel regression will be presented in section 7. Finally, we present our conclusion in section 8.

2. Literature review

The valuation created by ESG-ratings and factors has been a highly debated issue over a long period of time. (The earliest theory regarding environmental investments and social responsibility concluded that activities that exceeded the legally binding minimum standards would entail additional costs and would thus reduce firm value.) When we look back, the shareholder-first mentality was dominant in corporate America 50 years ago, due to an unprecedented wave of hostile takeovers (Cheffins 2020). More recent references emphasize that in a world in which shareholders are interested in their stakeholders' and their own welfare and wealth, companies should be held accountable for meeting their targets on carbon emissions as well as financial returns, and for delivering employment to future generations as well as pensions to current ones (Mayer 2020). Recent contribution to theory regarding ESG looks at its influence on potential increase of firm value and that investors recognize that ESG information about corporations is vital to understand corporate purpose, strategy and management quality of companies (Kell n.d.).

Since ESG is a relatively new phenomenon, conclusive findings regarding ESG and valuation is hard to find, even though the topic is extensively examined. One of the most conclusive findings in previous literature is that the so-called sin stocks outperform comparables with an average of 3-4%, but there is still evidence that sin stocks have a decreasing number of institutional owners (Hong and Kacperczyk 2009). This indicates that there is a preference for high ESG stocks, even though there is evidence that sin-stocks often perform better.

From a theoretical point of view, there are two sides of the relation between the market value of a firm and its ESG performance (Mervelskemper and Streit 2017). The first is the value-creating view that think of ESG focus as an advantage to generate competitive advantages and to improve financial returns to shareholders which in turn results in a higher market value (Alexander and Buchholz 1978). The other side is the value-destroying view that investments regarding ESG will increase costs and thus result in lower market value (Aupperle, Carroll, and Hatfield 1985).

Kempf and Osthoff (2007) constructed long-short value-weighted portfolios based on ESG measures from the S&P 500 and DS 400 stocks in the period 1992-2004, before Statman and Glushkov (2009) confirmed their findings based on data from 1992-2007. The results from these studies showed a positive relation to future returns in the 1990s, before the effect seemed to disappear in the 2000s. Still, high ESG scores have not led to lower future returns in the period up to 2012 (Hvidkjær, 2017).

Some event studies have found indications that the stock market does not respond positively on firms taking ESG-initiatives. Fisher-Vanden and Thorburn (2011) studied the response of the stock market to announcements regarding changes in firms' environmental policies.

More recently, it has been argued that socially responsible behavior may have a net positive impact on performance and firm value (Fatemi, Glaum, and Kaiser 2018), (Malik 2015). The correlation between ESG performance and financial performance and especially valuation, has been thoroughly investigated. A number of these studies have found either a negative (e.g., Boyle et al., 1997, Vance, 1975) or a nonsignificant association between ESG performance and financial performance or firm value (e.g., Alexander and Buchholz, 1978, Aupperle et al., 1985, Horvathova, 2010, McWilliams and Siegel, 2000, Renneboog et al., 2008a).

In a study carried out by Oxford University with more than 200 different sources, they found that prudent ESG and sustainability practices are not incompatible, but actually complementary, and correlate high ESG performance with lower operating costs, higher profitability and superior share price performance (Clark, Feiner, and Viehs 2015).

3. Measuring ESG

Although forces are driving ESG-investing forward, there are still issues that need to be addressed. One of the largest obstacles to overcome is the reporting of the ESG factors and how these are measured. Information about ESG is usually

generated through data vendors who collect company-reported information and data to provide an assessment of ESG performance (“Environmental, Social and Governance Scores from Refinitiv” 2019). Many organizations are trying to objectively measure companies relative ESG performance, but the quality of ESG data is not yet perfect. As of now, there are no standards of directly reporting by the companies, and the numbers collected is rarely audited by third parties. Although there is room for improvement, the quality and availability are driven up by market forces, and regulations like the EU directive requiring all companies of a certain size to report nonfinancial information once a year (Eccles and Klimenko 2019). Also, according to a PwC report about ESG, many large companies are not clear about why investors demand ESG data. Investors are looking for standardized and rigorous data to support their investment decisions. However, many firms were releasing ESG information inconsistently and in a manner investors found difficult to use (PwC 2019).

In 2018, the European Commission adopted a package of measures on sustainable finance. This package included proposals aimed at establishing a unified EU classification system of sustainable economic activities, improving ESG disclosure requirements to facilitate informed investor decision making, and creating a new category of benchmarks which will help investors compare the carbon footprint of their investments (“ESG Risk Management Framework” Deloitte).

ESG rating agencies use their own research methodologies to study and examine industries and businesses to assess corporate sustainability performance. This expertise has turned ESG rating agencies into a key reference for companies, financial markets and academia in terms of corporate sustainability assessments. With the growth of ESG performance, there could arise an agency problem if the ESG rating agencies act as an economic actor. The lack of guidelines and framework might motivate agencies to chase profit instead of their social responsibility. If social impact is not internalized and ESG rating agencies act only as economic actors, agencies statements about how corporate sustainability performance could be measured might be misrepresented. This could be overcome if the expectations held by society and rating agencies for sustainability and sustainable development are matched. Consequently, providing society with

misleading information about corporate sustainability can affect the social legitimacy and trust of both companies and ESG rating agencies (Escrig-Olmedo et al. 2019).

Information provided by ESG agencies regarding the measurement of risk is insufficient and very heterogeneous. Therefore, companies are faced with a lack of information that makes it difficult for them to discover which actions would open the door into one of the sustainability indices – and investors also face difficulties selecting sustainable targets for investment (Olmedo, Torres, and Izquierdo 2010). There is also evidence that each ESG rating agency regards different individual components of CSR (Corporate Social Responsibility) as relevant (Attig et al. 2013), making it difficult to make investment decisions without conclusive information. Other factors that make the decision-making difficult for investors and funds is that the ESG-agencies have gained increasing power over the market and investment decisions. ESG rating agencies' bargaining powers have grown exponentially, which could imply a biased concept of sustainability, if sustainability principles are not guaranteed in the assessment business. (Escrig-Olmedo et al. 2019).

4. Testable Hypothesis and Research Methodology

In “A Catering Theory of Dividends” (Baker and Wurgler 2003) a theory is developed that managers decide to pay dividends when investors put a stock premium on dividend payers. To determine the periods when investors prefer dividend-payers, they compare the Book to Market value of non-payers and payers over time. We rely on the same methodology to determine the periods where investors prefer to invest in high rated ESG firms. The same researchers published the paper “Market timing and Capital Structure” (2002) where they see evidence that firms tend to issue equity when the book-to-market value is high compared to past market values and repurchase stocks when the value is low. We use a similar methodology later to determine if high ESG firms tend to raise more financing during the periods where investors put a stock price premium on high ESG stocks.

4.1. Demand for ESG

To analyze the data collection to measure investors demand for ESG, we have used two variables to see if there are periods where investors have a higher preference for high-ESG firms: Market-to-Book ratio and ESG rating. To get a clear view of the difference between high and low ESG ratings, we have selected the top and bottom 25-percentile for each year between 2002 and 2019 and extracted the M/B-ratio for these firms, which we will use as the measure of demand. That means the companies with an average ESG rating will be excluded to provide a defined line between high and low ESG ratings. The output will give an indication regarding the coherence between ESG rating and the demand of the given company's stock. By sorting the companies into high and low ESG rating, we can find the average M/B-ratio on the two outputs.

Our hypothesis is that the firms with high ESG ratings will have a higher average M/B-ratio than the firms with low ESG ratings over the given time period, and that the trend will be stronger for the most recent years.

When a firm has a high M/B-ratio, it can be interpreted as the investors valuing the firm's equity higher than its book value. Since a higher ratio indicates that investors are willing to pay a premium for their share, our hypothesis implicitly states that a higher valuation can be explained by high ESG-ratings. This can indicate that investors are willing to pay a premium for highly rated ESG firms. The M/B-ratio in this thesis is therefore a measure of demand of a firm's stock. By comparing the average M/B-ratio next to ESG-rating of these samples over time we can determine if there has been a trend in certain periods where investors have preferred high rated ESG firms.

By finding the average Market-to-Book ratio for High and Low ESG-firms every year between 2002-2019, we are able to compare and see if there is a coherence for firms with high ESG and higher M/B-ratio. We will study the trend of the M/B-ratio over the reported years and analyze the potential effect of ESG from the demand of a given firm.

4.2. Additional Financing

For the second part we look closer into the firm's reaction to the demand for ESG. Our hypothesis is that firms will seek to raise additional financing through equity and debt when the demand is high for high rated ESG firms.

The next step is to analyze the relevant firms changes in reported debt and equity to identify new financing. We are then able to determine if there is a relationship that suggests that high ESG firms are more likely to raise additional financing during periods where investors have a higher preference for high ESG firms. Using data from Compustat, we are able to find the change in reported equity and debt to identify if firms raise financing over a specific time period.

To answer the question regarding raising additional finance for firms with high ESG, we construct a panel regression where we use a dummy variable indicating if a firm is increasing financing in a given year, and see if we find a higher probability that firms with a high ESG-rating increase financing in years where we have identified a higher demand for ESG. By running a regression in MATLAB, we are able to see how ESG-ratings are affecting financial decisions.

To investigate the potential effects of the investor's preference for good ESG performance, we look at the capital structure of the firms observed to see if they are more likely to raise additional financing, either via debt or equity, when investors seem to prefer ESG. We have used Compustat as the main tool to collect the necessary data to run the following regressions.

4.3. Panel regression

We use the numerical computing program MATLAB's fitlm-function to create a fitted linear regression model. We do this to explain the variation in our dependent variable that can be attributed to variation in our independent variables. Linear regression models are often used to quantify the relationship between the response variable and explanatory variables. The following formulas show the regression models we use, when including all explanatory variables.

$$\Delta Equity = \beta_0 + \beta_1 HighESG * High Years + \beta_2 FirmAge + \beta_3 FirmSize + \beta_4 Tobins Q + \alpha' Industry + \varphi' Years + \varepsilon$$

$$\Delta Debt = \beta_0 + \beta_1 HighESG * High Years + \beta_2 FirmAge + \beta_3 FirmSize + \beta_4 Tobins Q + \alpha' Industry + \varphi' Years + \varepsilon$$

*HighESG*High Years* is our variable of interest. This variable is a combination of two dummy-variables that together indicate if a company is in the top 25 percentile in a year where high ESG is in demand. For our dependent variable we have chosen to use a dummy variable that indicates whether a firm has issued new equity or debt in that given year. We also run regressions on the change in equity and debt in terms of dollar values. The variables Firm Age and Firm Size are particularly useful predictors of financial constraint levels according to Hadlock & Pierce (2010). The variable *FirmAge* shows us the number of years the firm is listed with a non-missing stock price on Compustat. *FirmSize* is defined as the log of inflation-adjusted book assets. We also use *Tobin's Q* as a measure of growth opportunities under the assumption that markets are efficient. *Industry* is a dummy variable that sorts the companies within the Standard Industrial Classification (*SIC*) and compare firms within the same industry group. *Years* is a dummy variable that controls for characteristics related to each year separately.

4.3.1. Endogeneity

Endogeneity is defined as a correlation between one or more of the explanatory variables and the error term in a regression (Roberts & Whited, 2013). It is arguably the most critical issue studies in empirical corporate finance face. The problem arises if you have not added all the variables that are related to both the explanatory and dependent variable in your regression model. This can result in inconsistent and biased parameter estimates.

The first OLS assumption is that the error term is uncorrelated with the explanatory variables (Stock & Watson, 2014, p. 170). Endogeneity leads to a violation of this assumption, and therefore should receive sufficient attention when working within empirical corporate finance. The main challenge is that

there is no way to statistically ensure that the endogeneity issue is solved, since the error term cannot be observed, and hence not be empirically tested.

4.3.2. Fixed Effects

There are several sources to endogeneity and therefore multiple possible solutions. One problem is omitted variables in the regression, where the solution is to add said variables. In some cases, these might be unobservable. We attempt to deal with this by controlling for industry- and year-fixed effects with dummy variables in our models. In our study we use data from the period 2002-2018, to control for characteristics related to specific time periods we have added control variables for each year.

Since we look at firms from a broad variety of industries, there might still be time-invariant industry characteristics that are unobservable in our data, and these could lead to the presence of fixed effects. If we assume that these characteristics are fixed over the period, it is possible to control for them by including industry fixed effects. We use this method to control for omitted variables when they vary across industries, but do not change over time (Stock & Watson, 2014, p. 403-404).

5. Data collection

5.1. Demand for ESG

As our data sample we used the companies from the S&P 500 as of 31.01.2020, as this would give a diversified sample with a variation of different sectors. The companies from this index is expected to be large enough to expect stable and precise reporting, but to get a more diversified sample, we added the companies included in S&P 500 as of 01.01.2002 as well, which made a total selection of firms 658, with available yearly data from 2002-2019. The total number of annual observations amounted to 11.884. To form the sample, we restricted this sample to all the active firms as of 31.01.2020 from our main sample of 658 firms, making it a total of 553 firms.

To provide us with the information necessary to answer our research questions, we have used Thomson Reuters Eikon for creating datasets for the analysis and gather historical data of ESG-ratings and Market to Book-ratio, and data from Compustat for further analysis regarding additional financing. For our study we have used all available previous data of reported ESG-ratings, which has shown to be from year 2002. As ESG has been modified and its importance magnified over the last years, we believe that the most recent years will give us the best answers regarding our research questions.

The sample consists of two factors, ESG-rating and Market to Book-ratio. To avoid any outliers that can negatively bias the results, we have used the following filters for the dataset:

Filters:

1. Removed all observations with a negative MTB.
2. Removed all observations with $MTB > 50$.
3. Remove all inactive firms as of 31.01.2020
4. Remove all observations with an ESG-rating that is not in the top/bottom 25 percentiles.

Regarding the limitations, we set the minimum weight to zero, because a negative M/B basically means they have negative book equity. To avoid any extreme observations and potential reporting errors, we drop observations where the M/B exceeds 50.

Our raw data provide us with annual stats from the two variables from all the 658 firms between 2002-2019, before we start filtering out the relevant data for further analysis. The ESG ratings of the firms will be sorted in top and bottom 25 percentiles that will provide around 165 observations each. This will be the base of our further investigation. Our analysis will then report the annual Market to Book-ratio for the firms associated with the top and bottom 25 percentiles of ESG rating of the firms.

When all the relevant Market to Book values have been extracted from the dataset, we are able to compute the means of the Market to Book values for both the top and bottom percentiles for each year. This will provide useful information for the analysis regarding demand of high ESG performance.

5.2. Additional Financing

For the second part we downloaded relevant variables from the original sample of the 658 firms from Compustat to use our findings regarding demand of ESG to further look at the firm's response to this. By extracting information about the firm's equity and debt, we were able to use this to look into high ESG-rated firms' decisions on whether or not they take advantage of the market momentum to raise additional financing. The sample Compustat could provide for our desired time-period was from 2002-2018, meaning data from 2019 was unavailable at this given time.

As in Baker & Wurgler (2002), we have defined book equity as total assets less total liabilities (Compustat Annual Item 181) and preferred stock (Item 10) plus deferred taxes (Item 35) and convertible debt (Item 79). When preferred stock is missing, it is replaced with the redemption value of preferred stock (Item 56). Debt is defined as total assets (Item 6) minus book equity.

All the variables from our regression are based on Compustat data, where Firm Size is the log of Total Assets (Compustat Item 6) and Firm Age is based on the number of years the firm is listed with a non-missing stock price on Compustat. For the Industry variable, we have used Standard Industrial Classification (Compustat Item 324) and created a dummy variable where we have sorted the firms in comparable industry classifications. Tobin's Q is measured by taking the market value of equity (Compustat Item 24 + 25) and the book value of debt (Compustat Item 9 + 34 divided by total assets (Compustat Item 6)).

6. Descriptive Statistics

To get an overview of our data we start by performing a univariate analysis to look at the distribution of the most important variables in our model. By doing this we want to reveal central tendencies in our data. We start of by looking at the distribution of firms within the ESG categories we have defined. We separate into the three categories High ESG (Top 25 percentile), Low ESG (Bottom 25 percentile) and Mid ESG (25-75 percentile). Logically the fractions should be exactly 25% for the High ESG and Low ESG, and 50% for Mid ESG, but in the process of matching the ESG-data (from Thomson Reuters Eikon) with the rest of the data (from WRDS Compustat), we had to remove some of the observations due to some cases of missing data and some cases of extreme outliers. Therefore, we were left with the fractions shown in table 1. Our 9156 observations originate from 658 firms and 20.2% belong in the High ESG category and 22,6% in the Low ESG category.

Table 1:

Fraction of High/Low ESG Firms

	All	High ESG	Mid ESG	Low ESG
Fraction (Non-weighted)	1	0,202	0,572	0,226
Fraction (Assets weighted)	1	0,450	0,447	0,103
Total Observations	9156	1849	5238	2068

When we look at the fractions when weighted for assets however, we see that the fractions change drastically. High ESG changes from 20.2% to 45% and Low ESG falls from 22.6% to 10.3%. This tells us that the High ESG firms on average are much larger than the Low ESG firms in terms of assets. It could seem like high ESG companies outperform the others, but there could of course be alternative explanations. It is not unthinkable that larger firms have more incentive to report and strive for higher ESG-ratings, since they might be under greater scrutiny from the public eye.

6.1. Differences between High-, Mid- and Low-ESG firms

In this analysis we want to look at the variables we use in our regression in addition to some key statistics individually, to investigate the systematic differences between the different types of firm.

Table 2:

Characteristics of All Firms

		All	High ESG	Mid ESG	Low ESG
Total Assets	1	48227,8	107465,3	37644,9	22069,0
	2	38632,4	96565,9	30531,2	19357,7
	3	11102,0	29141,2	9799,8	7240,8
Tobins Q	1	1,681	1,633	1,609	1,905
	2	1,638	1,603	1,568	1,854
	3	1,305	1,315	1,257	1,432
Firm Age	1	33,13	43,57	31,77	27,25
	2	33,12	43,67	31,74	27,18
	3	29	51	27	23
Debt Ratio	1	0,6426	0,6486	0,6554	0,6047
	2	0,6386	0,6469	0,6503	0,6032
	3	0,6359	0,6333	0,6530	0,6000
Revenue	1	16932,2	37539,2	13174,3	8017,6
	2	15463,3	35572,8	12375,5	7025,1
	3	6433,1	17608,0	5869,9	3964,2
RoA	1	0,0977	0,1079	0,0921	0,1028
	2	0,0978	0,1076	0,0926	0,1025
	3	0,0861	0,0983	0,0792	0,0905
RoE	1	0,2389	0,2976	0,2501	0,1580
	2	0,2713	0,3442	0,2629	0,2318
	3	0,2377	0,2740	0,2342	0,2222
Employees	1	45,8108	96,2298	35,2921	23,8515
	2	40,9560	86,2528	33,2570	21,0527
	3	16,1000	46,0000	13,4000	10,0000

1: Mean, 2: Trimmed Mean(1%), 3: Median

To account for extreme outliers, we believe it is most relevant to look at the trimmed mean results. Looking at the statistics for total assets, we can confirm the findings from table 1 that the high ESG firms are significantly larger in terms of assets. High ESG firms have on average more than three times more assets than

mid ESG firms, and almost five times more assets than low ESG firms, respectively. This trend can also be seen in the statistics for firm age and employee count, indicating that larger firms indeed have on average higher ESG ratings.

When we study the revenues, we see that high ESG firms have a considerably higher level of income. They follow almost the same pattern in revenue as in assets with high ESG on average having almost three times as much income as mid ESG firms, and just above five times higher than low ESG firms. Considering the differences in assets, we look at the Return on Assets (RoA) and see that this statistic is very similar for all categories, with High ESG firms outperforming mid ESG by only 0.5% and low ESG by 1.5%.

It is when we look at the Return on Equity (RoE) we see an interesting and considerable difference. The high ESG firms outperform mid ESG firms by 8,13%, and low ESG firms by 11,24%. This suggests high ESG firms can more effectively use the firm's assets to create profit. High ESG firms on average have a 4.37% higher debt ratio than Low ESG firms, and it could be argued that the High ESG firms are considered less risky and therefore are more comfortable with a higher level of leverage.

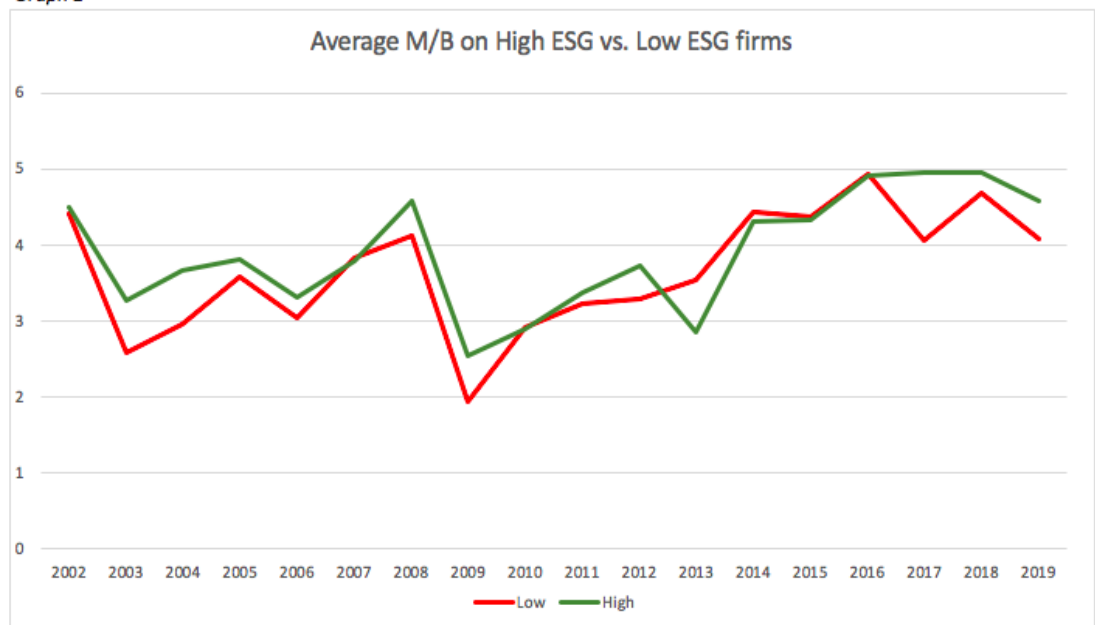
Assuming effective markets, Tobin's Q is a popular measure of growth opportunities. We see in our statistics that the low ESG firms on average have a Tobin's Q of 1.854, compared to the high ESG firms average of 1.603. This could imply that the low ESG firms have a greater potential for future operational performance. However, we believe that this difference can be explained by the gap in average firm age, since the high ESG companies are on average considerably older, and previous literature has found a negative relationship between firm age and growth. Compared to mid ESG firms, high ESG firms have a slightly higher Tobin's Q, even though they are a significantly older. One could also argue that the low ESG firms have a greater potential for growth, since they still have the possibility to achieve a higher ESG rating and the positive effects this could bring with it.

7. Results

7.1. Demand for ESG

From Graph 1, the annual average M/B ratio of High and Low rated ESG-firms is illustrated. The average M/B values for high-rated ESG firms from 2002-2019 is 3,9045, and for low-rated ESG-rated firms the average M/B is 3,6645. When we look at the graph, we can see that they follow the same trends, for instance with a major drop from 2008 to 2009, which can be explained by the financial crisis. From 2009 and until 2019 the M/B of the high rated ESG-firms has gradually increased and for the recent years stabilized on a level close up to 5, and with a decreasing level of volatility. This can be an indication that highly rated ESG-firms are in demand and that investors have changed their preferences towards sustainable firms over the last few years.

Graph 1



As for the low rated ESG-firms, we can see that they on average have a higher volatility, and it is interesting to see that when the last five years where the M/B of highly rated ESG-firms stabilizes, the volatility in M/B of the low rated ESG-firms is much higher than previous years, which can be considered as a growing uncertainty in the market regarding firms with a low ESG.

When it comes to differences in M/B ratio of high and low-rated ESG firms, the average difference over the given time period is only 0,24 or 6,15%. Graph 2 in the Appendix shows the difference in M/B between high-and low rated firms, where there is an overweight of High rated firms being higher than low rated firms. From the 17 years included in this analysis, high rated ESG-firms have a higher average M/B in 12 of those years, while low rated ESG-firms have a higher average M/B in 5 years. For the periods where high rated ESG-firms have a higher M/B we can also see that the difference is much larger compared to when low rated ESG-firms have a higher M/B. The average difference between High and Low is 0,4379, while the difference between Low and High is 0,1870. Additionally, three out of the five given values are lower than 0,05. This means that the years low rated ESG firms have a higher average M/B value, they have a very small difference, while in the opposite case where High have a higher average value, the gap between High and Low is significant.

For the hypothesis that recent years would give a clearer image of the differences between high and low-rated ESG firms because of the increasing focus regarding ESG and sustainability, we find it interesting to see that the biggest gap between High and Low in our study is in 2017, with a difference of 0,8897, after four years of slightly higher M/B ratio for Low rated ESG firms compared to High. From 2017 the highly rated ESG-firms have three consecutive years where the M/B is significantly higher. We believe this could be linked to the Paris Agreement that took effect from November 2016.

Although there may be other factors and variables affecting our results, there are indications that investors have started to consider ESG in their financial decisions. Based on our findings, high ESG-ratings tend to result in a slightly higher average Market-to Book ratio over the time period, with an increasing trend. This can mean that investors and funds are willing to pay a premium for highly rated ESG-firms. More importantly, the trend seems to be clearer over the past few years, which can be an indication that ESG receives a higher valuation now and will continue in the years to come. These results are consistent with Hong & Kacperczyk (2009) who found that high ESG firms receive higher relative valuations.

Graph 3 shows the annual change in the top and bottom 25 percentiles of the ESG-ratings from 2002-2019. We can see that there has been an increase in ESG ratings in general, here represented by the 25% best and worst firms from our sample. The top 25-percentile firms had in 2002 ESG-ratings above 52,5, while the bottom 25-percentile firms had an ESG rating lower than 36,11. Compared with the latest data from 2019, the top firms had an ESG rating above 77,5 and the bottom firms had ESG ratings lower than 55,21. The results emphasize the fact that the importance of ESG seems to have increased, especially over the last few years. It is also worth mentioning that the ESG measurements have improved in the last 20 years, which might have affected the numbers as well. From 2015 there has been a significant increase in both the top and the bottom percentile, indicating that ESG was getting more attention and firms actively worked on improving their rating. The data also shows that the gap between high and low-rated ESG firms has increased from 2002 to 2019, from 16,4 in 2002 to 22,3 in 2019.

7.2. Comparing Debt and Equity

We start by looking at the average changes in debt and equity for both high and low ESG firms. The results are presented in graph 4 and 5. We see that high ESG firms have a higher average annual increase in dollars in both debt and equity over the period from 2002-2018. High ESG firms have an average annual increase in debt of 1927\$ and 668\$ increase in equity, compared to a 1545\$ increase in debt and 459\$ increase in equity for low ESG firms (all numbers are reported in thousands). From the 16 years in our sample (2003-2018), the increase in equity for high ESG firms are larger than low ESG firms in 9 years, while the increase in debt for high ESG firms are larger than low ESG firms in 11 out of the 16 years in the sample. This could indicate that high ESG firms have found it easier to increase financing in general over the period, although we know from table 3 that the high rated ESG firms are also the largest firms based on total assets. With that in mind, we find it natural to check for relative change as well, and here we find that low rated ESG firms have a higher average increase in both debt and equity. For low rated ESG firms we find that debt and equity have an average increase of 12,44% and 13,05%, respectively, and high rated ESG firms have an average increase of 8,04% and 9,26% respectively (with trimmed means of 1%). These

results are not surprising, since we have already shown that the low rated ESG firms are smaller in terms of assets, and it is not unnatural that they need relatively more financing.

Out of the 16 years in the sample, only 4 years show a higher increase in equity than debt for both high- and low rated ESG firms. The average difference between change in debt and equity for high rated ESG firms is 1249,25\$ and for low rated ESG firms the difference is 1086,53\$. Based on this we see that in general there is a higher change in debt compared with equity both for high rated ESG firms and low rated ESG firms, suggesting that firms are more inclined to issue debt than equity.

We created graph 6 and 7 to illustrate the difference in debt and equity for high- and low ESG firms over the period. We found that of the ten years where demand seems to be higher for high ESG firms, we only find that high ESG firms have a higher increase in debt in six of them. We get the same results for equity where we also find a higher increase in equity in six of the ten years we expect, given the premium we found in our previous research. From our findings, the average difference in change in debt is 381,6\$, meaning that high rated ESG firms on average has a higher raise in debt over the period. The average difference in change in equity is 218,86\$ for the same period. We can therefore conclude that high rated ESG firms have an average annual increase in financing of 600\$ higher than low rated ESG firms which can be interpreted as a strong indication that firms take advantage of the market momentum to raise additional financing when they have a high ESG.

7.3. Panel regression

Table 3A reports the effect on change in equity and debt. We create seven different regressions with an increasing amount of control variables. For the first regression regarding equity, we only look at the variable High ESG*Years. The coefficient has a significantly positive effect of 0,1095 on a 1%-level. For the regressions 2-6, we include variables one by one to look at the gradual effects, with most coefficients being significant on a 1%-level. For the 7th regression we include all our variables, including our control variables Industry- and Year-

dummies, which cause a change in the High ESG*Years-coefficient to 0,1296, meaning that the variable has a positive effect on change in equity on a 1% significance level. Our regression in table 3B measures the change in dollar value gives us similar results, with a 5%-level significant coefficient of 525,39. This is consistent with the evidence of Baker & Wurgler (2003), who use a similar methodology to prove that low-leverage firms issue additional equity when their valuations are relatively low. The coefficient of Firm Size provides a negative significantly coefficient of -0,0341, while Tobin's Q provides a positively significant coefficient of 0,0325. The coefficients of Firm Age are slightly negative until regression (6), with a decreasing rate of significance. This result was quite surprising, as the variable Firm Age was very significant in our preliminary regression when we checked for the dollar change in debt and equity. Compared to the regressions from 2-6, the 7th regression has the highest R-squared with a value of 0,188, and additionally, all variables except Firm Age is significant on a 1%-level.

Table 3A:

	Effect on change in equity						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
High ESG x Years	0,1095***	0,1157***	0,1155***	0,1145***	0,1127***	0,1316***	0,1296***
Firm size		-0,068***	-0,0584***	-0,0529***	-0,0875***	0,0006	-0,0341***
Firm age			-0,0013***	-0,0012***	-0,0007**	-0,0003	0,0002
Tobins Q				0,0054	0,0123***	0,0262***	0,0325***
Industry controls	No	No	No	No	Yes	No	Yes
Year controls	No	No	No	No	No	Yes	Yes
R-squared	0,0132	0,021	0,0233	0,0235	0,0344	0,178	0,188
Observations	8643	8610	8610	8610	8610	8610	8610

	Effect on change in debt						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
High ESG x Years	-0,0054	-0,005	-0,0055	-0,0149	-0,0148	-0,0146	-0,0147
Firm size		-0,006	0,0085	0,0619***	0,0444***	0,0518***	0,0346***
Firm age			-0,0019***	-0,0015***	-0,001***	-0,0018***	-0,0013***
Tobins Q				0,0528***	0,055***	0,0467***	0,0489***
Industry controls	No	No	No	No	Yes	No	Yes
Year controls	No	No	No	No	No	Yes	Yes
R-squared	0,0003	0,0004	0,0062	0,0295	0,0374	0,0903	0,098
Observations	8643	8610	8610	8610	8610	8610	8610

***, ** and * represent significance levels of 1%, 5% and 10%.

We do the same for the effect on change in debt, where we experience quite different results from our variable of interest compared to change in equity. From the table we see that the coefficient High ESG*Years reports negative coefficients in all seven regressions, and the variable is not significant on any levels in any of the regressions, the same goes for the regression measuring the dollar change. For

the 7th regression, all other variables display coefficients with a significance level of 1%, including Firm Age that was insignificant on the effect in equity. As the regression for equity, the variable Tobin's Q also here provides a positive influence on change in debt with a value of 0,0489, while Firm Size here has a positive effect of 0,0346. Firm Age provides us with a consistent negative effect in all regressions, and with a value of -0,0013 in regression 7. Naturally, the highest R-squared value is in the last regression, with a value of 0,098. From our results we see that the regressions for the Effect on change in debt provides us with less significant results compared to equity when it comes to our variable of interest.

Our results show a surprisingly large difference in significance for the coefficient in the effects on equity and debt. From the results in part 1 we found that the changes in debt had much higher volatility over the years, and the amounts of debt taken on by firms was greater compared to the additional equity raised by the firms. An explanation as to why the two regressions differs so much can be that our given variables are not sufficient to explain the large differences in debt while equity has a more stable development which can easier be explained by fewer variables. Moreover, when firms adjust their capital structures, they tend to move towards a target debt ratio that is consistent with theories based on trade-offs between the cost and benefits of debt (Opler and Titman 1994), making the changes in debt more difficult to interpret. This also similar to the findings in Baker & Wurgler (2003) that firms tend to issue equity instead of debt when their valuations are high compared to historical numbers.

7.4. Robustness

Our regressions have showed that being a high rated ESG firm in a year where investors prefer ESG has a positive effect on the likeliness the firm will issue equity and on the amount of equity raised in terms of dollars. We have previously showed that perhaps the main challenge or alternative explanation to our results in terms of dollar value, is that the high ESG firms tend to be significantly larger than the low ESG firms in terms of assets. As in Chen, Goldstein and Jiang (2007), there is a concern about the effect of the firm size. We have included the variable Firm Size to capture this effect, but we wanted to do more to check for robustness in our model.

Table 3D:

	Effect on change in equity						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
High ESG x Years	657,54***	554,4**	548,19**	519,3**	556,01**	548,18**	586,44**
Firm size		1170,3***	1264,1***	1432,4***	1421,9***	1551,0***	1558,2***
Firm age			-11,038***	-9,9491***	-13,988***	-8,14***	-11,92***
Tobins Q				159,73***	130,94***	187,83***	159,23***
Industry controls	No	No	No	No	Yes	No	Yes
Year controls	No	No	No	No	No	Yes	Yes
R-squared	0,0009	0,0238	0,0258	0,0279	0,0534	0,0422	0,068
Observations	8536	8505	8505	8505	8505	8505	8505

***, ** and * represent significance levels of 1%, 5% and 10%.

We created a new regression where we excluded all observations from high ESG firms that were larger than the largest low ESG firm, this amounted to 105 observations. From table 3D we see that this actually led to higher estimated coefficients for our variable of interest, growing from 525,39 to 586,44, and staying at the same significance level, when all variables are included.

8. Conclusion

In our thesis we have investigated investors demand for high rated ESG firms by comparing M/B ratio to ESG rating from a sample from S&P 500. We sorted the firms into high-, mid-, and low-rated ESG firms and compared the average M/B ratio of high and low-rated ESG firms. Next, we sought to find out if firms were more likely to raise additional financing when investors seemed to like high ESG. We ran three sets of regressions, with several specifications to check if we could find significant evidence that firms raise additional equity and debt when the demand for ESG was high.

Our results indicate that investors prefer firms with high ESG-ratings and are willing to pay a premium for this. We also see a trend where high ESG-rated firms have stabilized at a higher level since 2017, this could be linked to the Paris Agreement taking effect from November 2016. This is in line with the findings from Hong and Kacperczyk (2009), that high ESG firms receive higher relative valuations. From our panel regression we see that being a high ESG firm in a year where there is a higher demand for ESG, has a significant positive effect on equity raised, indicating that high ESG firms do raise additional Equity when the demand for ESG is high. This is a similar trend that Baker & Wurgler (2003) found for

low-leveraged firms. However, the case is not the same for debt, where we find a slightly negative, but statistically insignificant relationship, which we can connect to the findings of Morck et al. (1990), where they find that debt financing is low following high stock returns.

This research is important for investors and firms to analyze the implications ESG-ratings have on the market. ESG is now taking a bigger part of investing decisions, and we see a development in how ESG is evolving. Our findings can be used to show investors preferences towards ESG and how firms respond to the demand for ESG. Baker, Stein and Wurgler (2003) found that stock prices have a stronger impact on the investment of “equity-dependent” firms—firms that need external equity to finance marginal investments. Since we found a positive relationship between ESG-ratings and stock price, our study could be relevant for managers in “equity-dependent” firms that are considering taking on ESG-initiatives. Further research can investigate the significance M/B ratio has on demand, and also add other measures of demand to determine how investors react to ESG. Additionally, larger samples and other firm-related datasets can be used to test both demand for ESG and the firms additional financing. It could also be interesting to see a similar study with ESG statistics from one or several other ESG-rating agencies.

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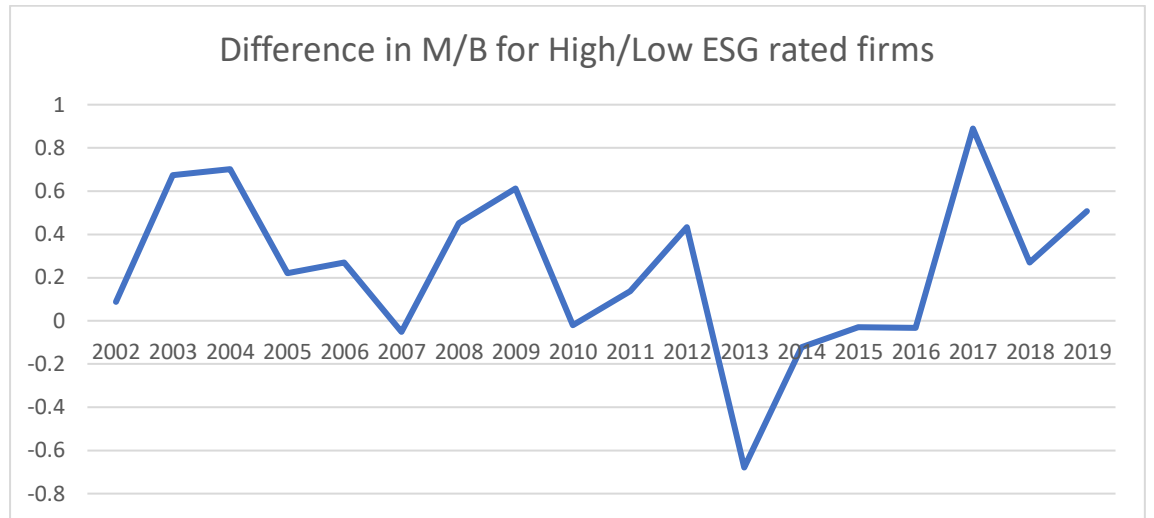
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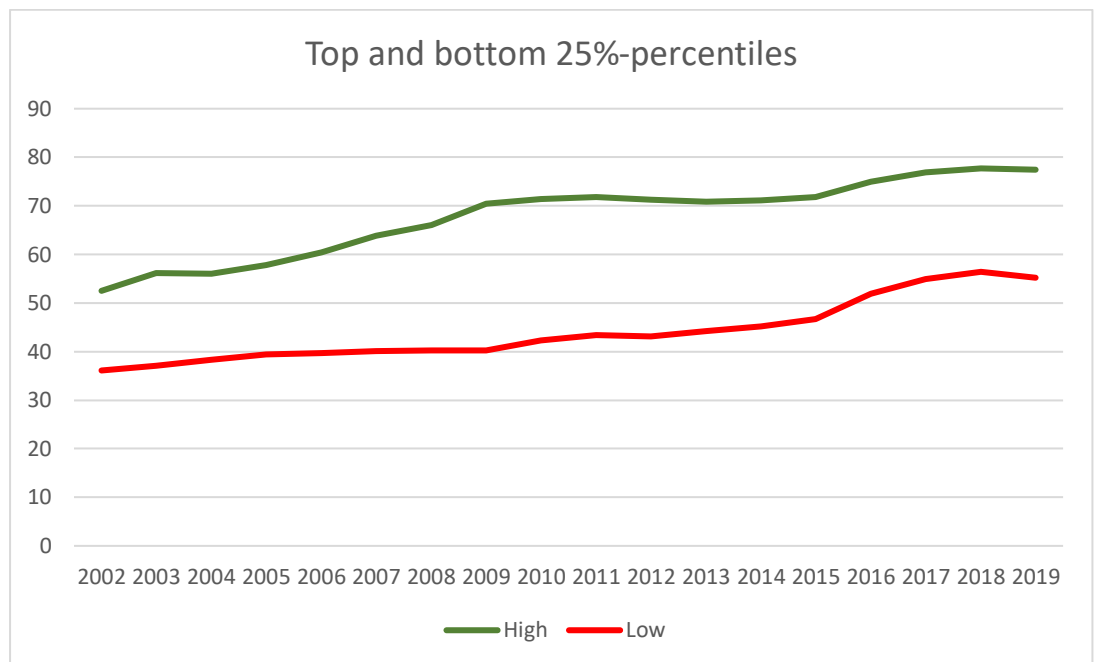
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Appendix:

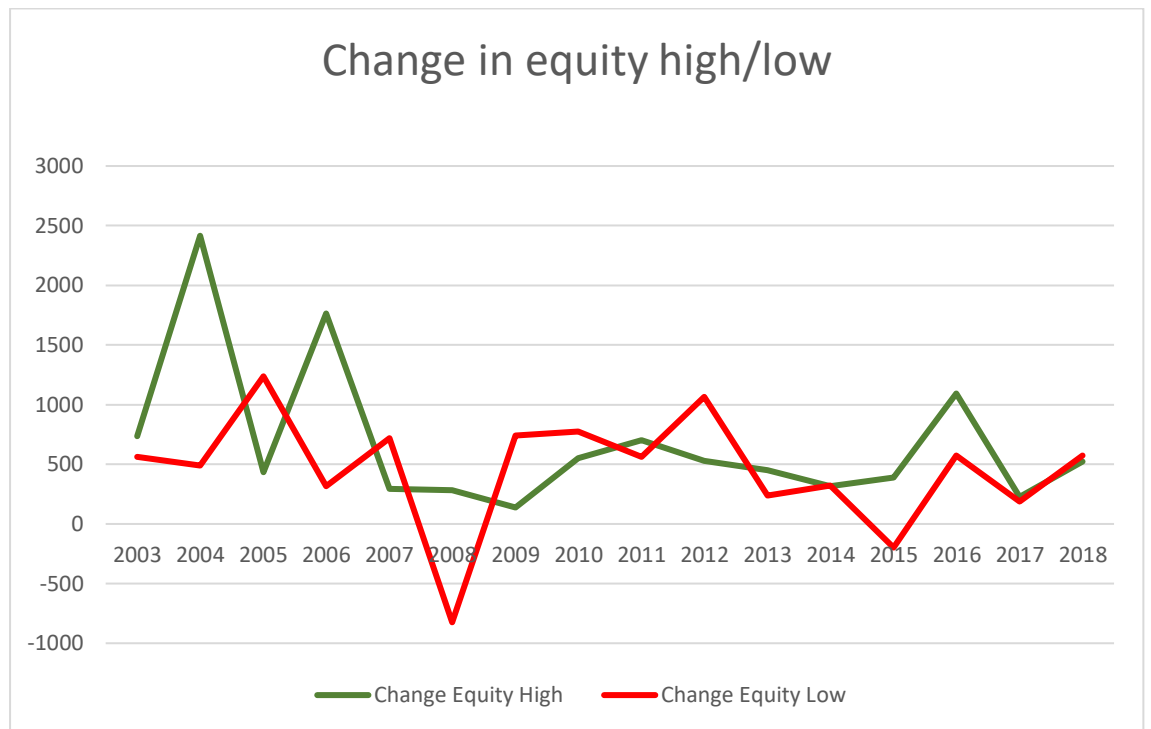
Graph 2.



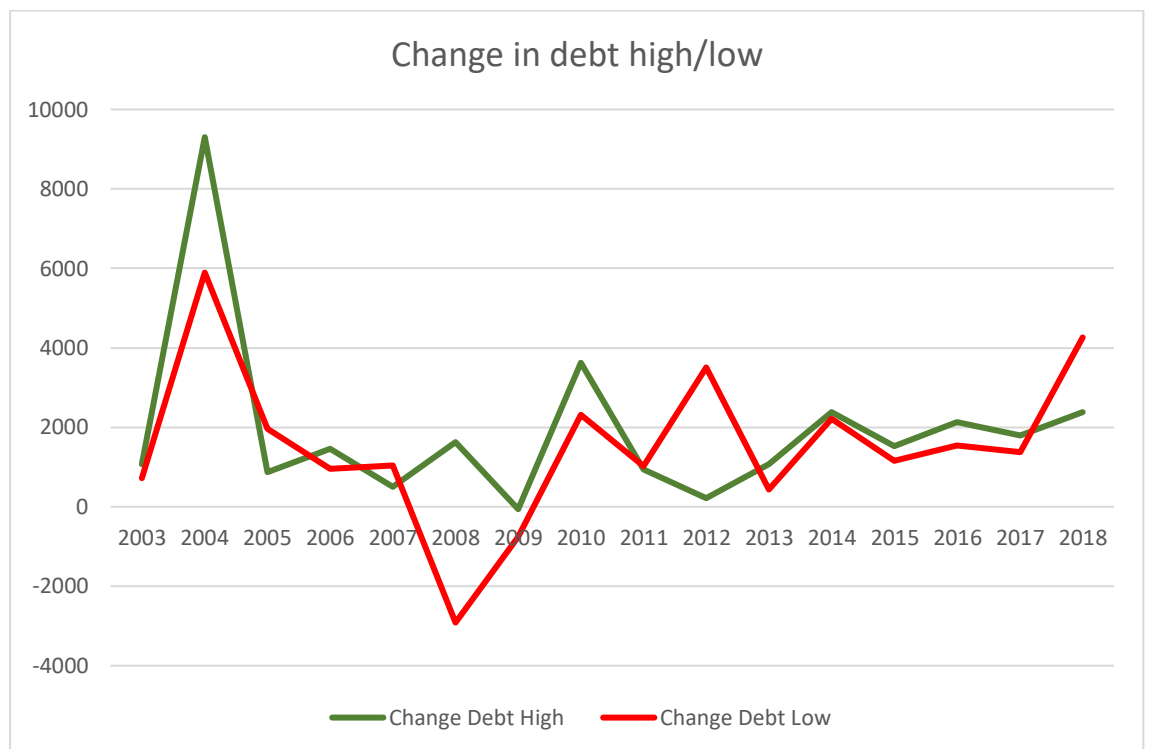
Graph 3.



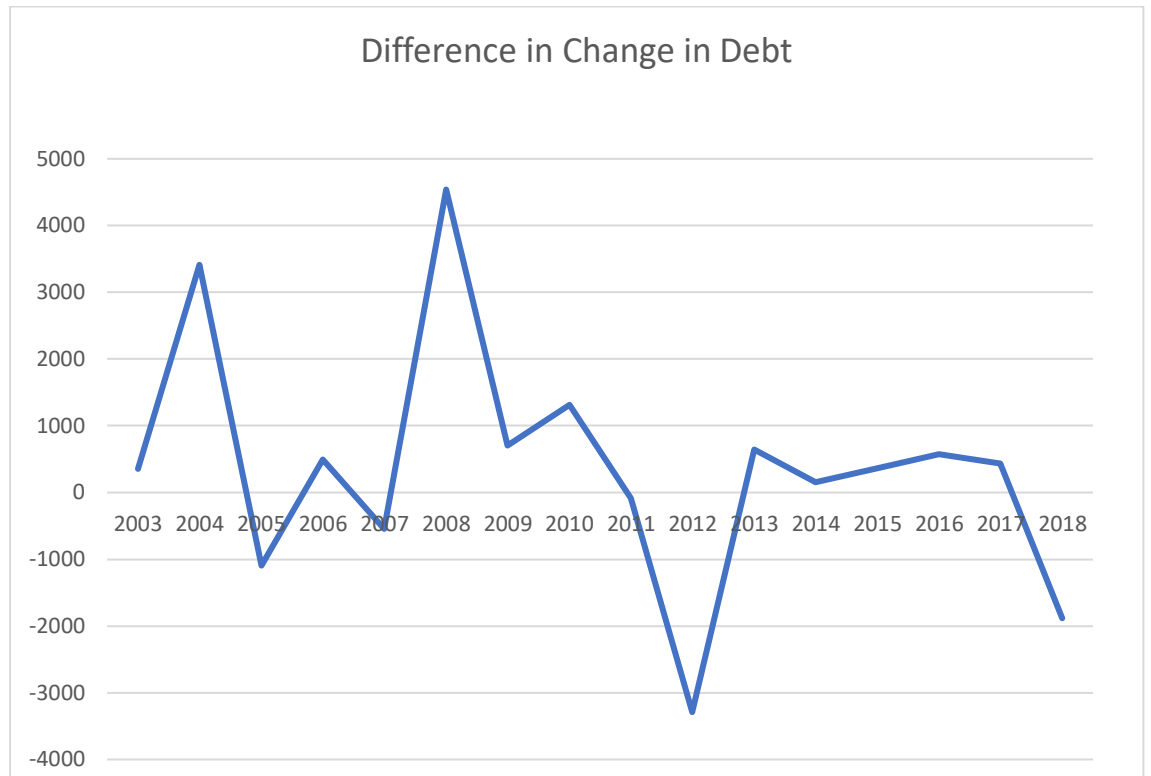
Graph 4.



Graph 5.



Graph 6.



Graph 7.

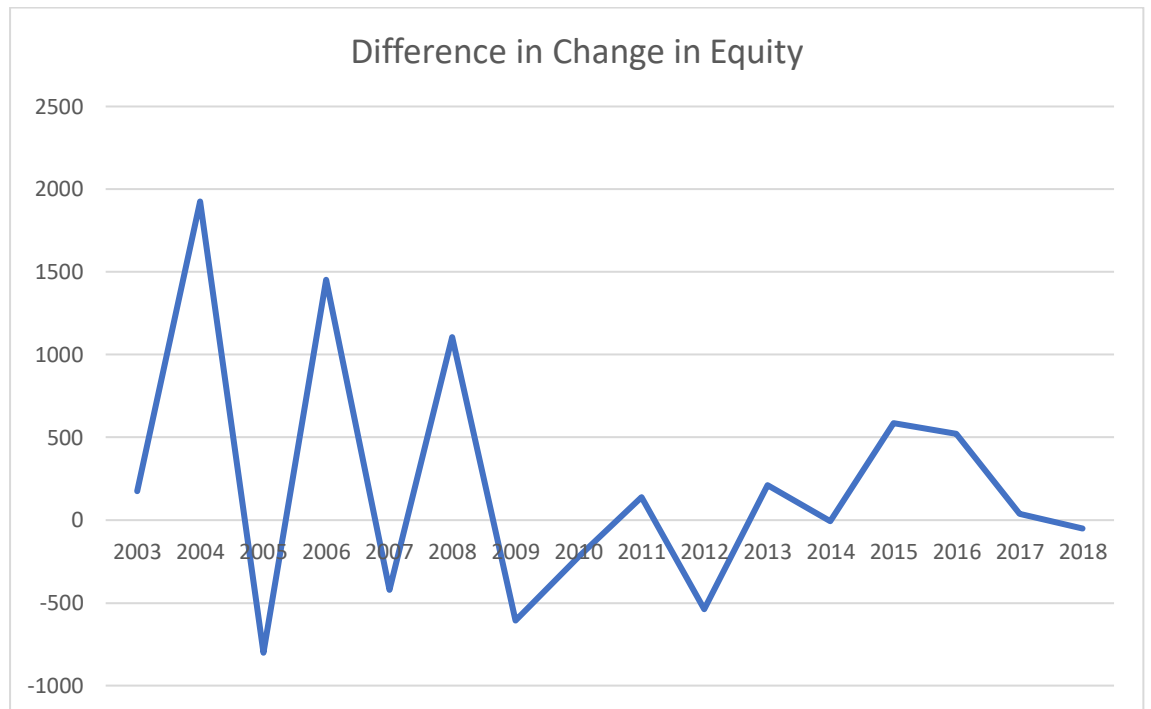


Table 3B:

Table 3B: Effects in \$ value

Effect on change in equity							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
High ESG x Years	594,14**	482,8*	480,38*	448,14*	481,39*	489,73*	525,39**
Firm size		1414,6***	1503,1***	1686,7***	1694,2***	1823,3***	1851,8***
Firm age			-11,686***	-10,411***	-13,325***	-8,0497***	-10,687***
Tobins Q				181,28***	158,07***	217,57***	193,89***
Industry controls	No	No	No	No	Yes	No	Yes
Year controls	No	No	No	No	No	Yes	Yes
R-squared	0,000878	0,0322	0,0341	0,0364	0,0544	0,545	0,073
Observations	8643	8610	8610	8610	8610	8610	8610

Effect on change in debt							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
High ESG x Years	823,4	326,62	315,45	233,65	233,4	315,2	319,81
Firm size		5932,2***	6340,8***	6806,5***	5559,9***	7242,7***	7067,1***
Firm age			-53,954***	-50,719***	-31,447***	-42,379***	-22,288*
Tobins Q				460,0***	509,03***	563,09***	607,98***
Industry controls	No	No	No	No	Yes	No	Yes
Year controls	No	No	No	No	No	Yes	Yes
R-squared	0,00183	0,0375	0,0401	0,0411	0,045	0,0469	0,0511
Observations	8643	8610	8610	8610	8610	8610	8610

***, ** and * represent significance levels of 1%, 5% and 10%.

Table 3C:

Table 3C: Relative change in %

Effect on change in equity							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
High ESG x Years	4,9678	5,0143	4,9841	4,5784	4,4741	4,4011	4,2993
Firm size		-0,0735	1,1682	3,458*	3,4136*	4,4085**	4,4174**
Firm age			-0,164***	-0,148***	-0,1411**	-0,131**	-0,1225**
Tobins Q				2,2622***	2,3134***	2,6627***	2,7091***
Industry controls	No	No	No	No	Yes	No	Yes
Year controls	No	No	No	No	No	Yes	Yes
R-squared	0,0004	0,0004	0,0016	0,0027	0,0031	0,0045	0,005
Observations	8643	8610	8610	8610	8610	8610	8610

Effect on change in debt							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
High ESG x Years	77,857	70,752	71,118	95,469	99,455	77,001	80,674
Firm size		84,478	69,424	-67,993	-52,165	-97,025	-85,246
Firm age			1,9879	1,0275	0,1213	0,616	-0,3427
Tobins Q				-135,76***	-136,55***	-145,25***	-146,05***
Industry controls	No	No	No	No	Yes	No	Yes
Year controls	No	No	No	No	No	Yes	Yes
R-squared	0,0001	0,0004	0,0005	0,0036	0,0042	0,0055	0,0061
Observations	8643	8610	8610	8610	8610	8610	8610

***, ** and * represent significance levels of 1%, 5% and 10%.