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SCHOOL OF BUSINESS, ECONOMICS AND LAW

Bachelor Thesis in Financial Economics

Market Valuation of Growth in ESG Companies

A quantitative study conducted on the European markets

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Abstract

The increased interest in sustainability among investors has raised questions regarding the fundamentals of the valuation for sustainable companies, often called ESG companies. This thesis researches the market valuation of the growth rate of revenue in ESG companies, compared to non-ESG companies, to evaluate if there exist any differences. A quantitative method has been used to study this relation, and the study was conducted with a sufficiently large sample from the European markets between 2017 to 2020 to create a reliable result. From the findings, it could not be concluded that there is a significant valuation difference for the growth rate of revenue depending on whether a company is considered an ESG company or not. Hence, the growth rate of revenue could not be a factor explaining differences in the market valuations of ESG companies.

Keywords: **ESG; Sustainable Investments; Sustainable Finance; Sustainability; Market Valuation; Growth; Revenue Growth**

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1. Introduction

1.1 Background

Focus on sustainable investments has been growing rapidly during recent years, and sustainability is today an essential factor when investors decide where to invest (Eccles and Klimenko, 2019). A changing world with global sustainability challenges comes with new risk factors, which has forced investors to adapt and reevaluate traditional investment strategies (MSCI, 2021). Increased awareness of climate change and environmental risks has further reminded the investor community about the importance of these aspects and the duty among fiduciaries to consider the associated financial risks that come with it (Eurosif, 2016). ESG investing is often considered a synonym for sustainable investing, where ESG is an abbreviation for environmental, social, and governance factors (MSCI, 2021). According to MSCI (2021), ESG investing is a strategy framework that adds these non-financial factors to the investment decision-making process, in addition to the traditional financial analysis.

The environmental in ESG stands for climate change, use of natural resources, and pollution and waste. The social in ESG stands for human capital, product liability, stakeholder opposition and social opportunities. Lastly, the governance in ESG stands for corporate governance and behaviour (MSCI, 2021). Historically, integrating environmental, social and governance factors into investment portfolios has been seen as a detractor to performance rather than a positive factor (Scherwood and Pollard, 2019). Today, most investors view ESG investing as performance-enhancing as quantitative data has shown superior long-term performance, with lower risk and higher returns, of ESG portfolios compared to traditional portfolios (Scherwood and Pollard, 2019).

ESG is a relatively new phenomenon in sustainable finance, developed from continuing growth in sustainable and responsible investment, abbreviated as SRI (Eurosif, 2016). Fiduciary duty considerations are among the main drivers for SRI, and ESG considerations are an essential investment obligation in line with fiduciary duty for fund managers. In the European SRI study (2016), SRI is considered a long-term investment approach where ESG factors are included in the selection of securities for an investment portfolio. SRI combines the fundamental analysis and engagement with the ESG factors to capture long-term return for investors (Eurosif, 2016).

To identify and measure ESG factors, which create transparency for investors, several rating agencies have developed rating systems to provide data on private and public companies' environmental, social and governance factors (Scherwood and Pollard, 2019). Accordingly, the ratings simplify the process for investors to evaluate how companies perform against ESG criteria and have become an indicator of how sustainable a company is. This further decreases information asymmetry for investors and can be a driver for more sustainable initiatives. Continuing forward in this study, companies with high ESG scores will be called ESG companies. According to data from MSCI (2021), high ESG-rated companies, compared to low ESG-rated companies, tend to have higher profitability and dividend payment, and lower experience of idiosyncratic risk incidents and systematic risk exposure. In addition, Clark, Feiner, and Viehs (2015) found, in a research of 41 papers on sustainability and the relation to financial performance, that the market positively values superior sustainability quality for companies.

The U.S. Business Roundtable released a statement in 2019, showing that global sustainable investment is up 68% since 2014 and ten times since 2004. ESG is proven to drive consumer preference, and many consumers are willing to pay to “go green” (McKinsey on Finance, 2020). A recent study, also presented in McKinsey on Finance, has shown that companies with social engagement achieve higher valuation than companies with lower social capital. Another major study showed that nearly half of the surveyed companies identify that business and growth opportunities are reasons for starting sustainability programs, and create value through revenue growth (McKinsey on Finance, 2020).

When valuing a company, numerous factors are affecting the company that needs to be taken into account. Baresa, Bogdan and Ivanovic (2013) argue that one way to contradict the many uncertainty factors that are almost always impossible to predict when valuing a company is to use fundamental analysis. They describe that fundamental analysis aims to predict future profits, dividends and risks to calculate the company's actual market value. The method of fundamental analysis takes both micro and macro-economic factors into account, as well as the historical performance of the company and various financial statements (Baresa et al., 2013). A valuation analysis has to deal with the past, present and future of the company (Berk, Green and Naik, 1999). As a result, the market value of a company is the sum of the present value of cash flows generated by the assets in the company and their growth options. The company’s

price should consist of both the value of existing projects within the company and the value of the growth opportunities for the company (Berk et al., 1999).

The interest for ESG companies has resulted in that ESG information often is associated with numerous economically meaningful effects, like lower cost of capital (Dhaliwal, Li, Tsang, and Yang, 2011) and lower capital constraints (Cheng, Ioannou, and Serafeim, 2014). Factors like these are taken into account when making a valuation through fundamental analysis of a company. Further, a growing number of socially responsible investors consider ESG information in their investment allocation, proving that this kind of information has become more critical in the investment process than in the past (Eurosif, 2016).

Through the financial sector activities, financial institutions and financial markets impact the environment, society, and sustainable development (Helleiner, 2011). The sector needs to concentrate on managing sustainability risks in their investments by integrating them into their evaluation (Evangelinos and Nikolaou, 2009). Environmental risks and environmental regulations significantly influence a bank's credit portfolio risk and must be managed thoroughly (Goss and Roberts, 2011; Weber, 2014). Instead of only reacting to sustainability issues that directly influence financial sector risks and opportunities, the financial sector should also try to develop financial sector intervention strategies that address sustainability problems (Weber, 2014). In order to meet the EU's climate and energy targets for 2030, it is fundamental to have direct investments towards sustainable projects and activities (European Commission, 2020). Hence, there is a solid need to redirect capital flows toward projects that reduce pressure on the environment and consider the social and governance aspects. According to the European Commission (2020), this sustainable economic growth is expected to increase during the following years and will be supported through different initiatives.

1.2 Problem Definition

An early assumption rooted in neoclassical theory was that ESG harmed financial performance (Fatemi, Glaum and Kaiser, 2017). Friedman summarised this in his article from 1970, where he argued that the maximisation of profit to the company owners is the only social responsibility of a company. His assumption about ESG activities was that the payoff did not exceed its costs (Friedman, 1970). More recent studies argue that socially responsible behaviour positively impacts financial performance and market valuation (Fatemi et al., 2017). In a Bloomberg (2020) report, companies with high ESG scores outperform the market and usually trade at higher valuations. Flows to European sustainable funds in 2020 almost doubled compared to 2019, amounting to a total value of EUR 233 billion during the year (Morningstar, 2021). The high inflow of capital to ESG companies raises a discussion about the valuation of these companies, and if the valuations are getting disconnected from the fundamentals (Bofinger, Heyden and Rock, 2020).

The efficient market hypothesis states that a company should trade at the fair market value and that the market valuation should reflect all available information (Fama, 1970). According to Fama (1970), the price of a company should reflect the buyer and seller's fundamental analysis of the company's performance and risks. Because of increased interest in ESG among investors, a key question regarding the valuations of ESG companies is what drives the market valuations and if they are considered reasonable for investors. It is problematic to understand what these market valuations consist of and why investors choose to invest in ESG companies, even though they may trade at higher multiples. According to Morgan Stanley (2016), there is a robust demand-driven growth of sustainable investment in the asset management industry, and a buying pressure can be expected from institutional investors from now on to meet their clients' demand. However, it is ambiguous if the increased demand for sustainable investments is only a consequence of a trend for investors or if it could be motivated and explained by factors like lower risk or higher growth expectations (Kaiser, 2020). Sustainable companies do not need to transform the business to meet this increasing demand for sustainable investments. Instead, more efforts can focus on improving business processes and increasing revenue. If we are currently only at the beginning of a sustainable growth path, ESG valuations can be motivated with expectations of higher future growth (Kaiser, 2020).

The relation between market valuation and growth creates a discussion that this thesis is based

on. ESG factors are considered necessary in the long-term return for investors (JP Morgan, 2021). The environmental, social, and governance risks are hard to quantify but affect the long-term value (Morningstar, 2020). For investors, the quantifying problem makes it difficult to measure ESG companies comparably through quantitative financial metrics. To make wise investment decisions, investors need to know what variables affect the market value of ESG companies to not suffer from lost returns. The impact that investors can make by investing in sustainable companies is also threatened if the market valuation of these companies is unreasonable and unfavourable for future returns. The long-term aspect of returns on sustainable investments leads to an attempt to explain ESG valuations, which leads to the purpose of the thesis. A strong ESG position helps companies expand into new markets and grow into existing ones, creating value through revenue growth for these companies (McKinsey on Finance, 2020). Understanding factors that drive market valuation is of utmost importance for investors, and because of the long-term aspect of ESG investments, the revenue growth is a factor that needs to be further evaluated.

1.3 Purpose

The purpose of the thesis is to investigate the effect of the growth rate of revenue on the market valuation in ESG companies. The aim is to examine if revenue growth is higher valued in these companies. If true, this could explain the long-term approach to ESG investing. The motivation behind this purpose is to examine if growth opportunities explain why ESG companies tend to trade at higher valuations.

The null hypothesis of the thesis is:
H_0*: There is no difference in the market valuation of the growth rate of revenue in ESG companies compared to non-ESG companies*

1.4 Expected Contribution of the Study

The thesis will contribute to the existing body of research by extending the knowledge and understanding of factors driving the market valuation of ESG companies. There exists previous research about the relation between ESG, financial performance and market valuation. Although, the driving factors behind the valuations have not been studied to the same extent. This thesis provides additional depth to the subject by analysing a specific variable for explaining the market valuations of ESG companies. Furthermore, the test of the hypothesis will provide investors with insights about the effect of the growth rate of revenue on market valuations when valuing ESG companies.

2. Theoretical Framework and Previous Research

This section provides the thesis with theoretical frameworks and previous research which are used to evaluate the regression results. The theoretical framework explains traditional valuation strategies as well as it provides theories on growth and asymmetric information. The previous research presents earlier findings from ESG studies and contributes as a ground for the method.

2.1 The Efficient Market Hypothesis

This hypothesis is an investment theory that concludes that stocks always trade at their fair market value. This theory was developed by economist Eugene Fama (1970) and is written about in his article "Efficient Capital Markets: A review of theory and empirical work" in the Journal of Finance. In this article, Fama concluded that his empirical tests supported the theory of efficient markets.

According to the efficient market hypothesis, investors immediately react to new information about a company (Fama, 1970). Consequently, investors will consider the latest news and reevaluate companies' market value to a reasonable level that reflects the new expected rate of return and risk. By this immediate response, Fama (1970) states that market valuations fully reflect all available information and quickly adjust to further details. This theory implies that there will be no undervalued or overvalued securities available since there is no way to outperform the market when prices include all information. The efficient market hypothesis signifies that the only way for investors to receive a higher return is by taking on riskier investments (Fama, 1970). The main idea behind the theory is that prices should reflect all available information, which is considered when analysing the regression model results. If the efficient market hypothesis holds, a higher growth rate of revenue should implicate a higher market value, everything else equal. Furthermore, there always exists an explanation in the information available on the market to why some companies trade at higher multiples as their fair value.

2.2 Price Discovery

The efficient market hypothesis assumes that the market price of securities also defines what a security is worth. From this theory, it would be possible to calculate the security value without regard to buyers or sellers of the security (Cunningham, 1994). A process that would state that the efficient market hypothesis is false is the price discovery, which concludes that prices of assets are determined between buyers and sellers on the market (Cunningham, 1994). Several factors affect the pricing of stocks, such as supply and demand, risk preference of the investor, and the overall geopolitical environment in the economy (Francioni and Schwartz, 2017). Demand and supply will intersect at a given point in the economy and thus set the price, which allows the transaction to occur. In this theory, the consensus valuation of the broader market will affect the adaptive valuation behavior of investors (Francioni and Schwartz, 2017). High demand for sustainable companies among investors can, according to price discovery, affect the price setting of these stocks. This theory implies that a higher market value of ESG companies does not necessarily need to be explained by numbers or results. Hence, higher demand can be sufficient alone for raising market value.

2.3 Asymmetric Information

Connelly et al. (2011) describe the theory of asymmetric information and how actors in the market have access to different amounts of information. They explain that investors will make decisions based upon the accessible information, and that it is problematic for the efficiency of markets that some actors have better information than others. In recent years, the transparency of how companies work with ESG related questions have been improved through different accounting standards (Deloitte, 2016). Under Directive 2014/95/EU, EU Law requires that large companies disclose certain information about how they operate and manage social and environmental challenges. Through this directive, investors and other stakeholders could better evaluate the non-financial performance of companies (Directive 2014/95/EU). In addition, several different ESG indexes performed by rating institutes have evolved over the past years, which further aims to decrease information asymmetry for sustainable investments (Refinitiv, 2021; MSCI, 2021; Sustainalytics, 2021). The theory of asymmetric information can be used to explain and illustrate how companies' transparency could improve market efficiency. By decreasing the information asymmetry, the actors in the markets have better insight into companies' operations, which reduces the risk for investors. In the well established ESG score

list from Refinitive Eikon, transparency is also taken into account. Hence, companies with better disclosure will receive a higher ESG score than companies that do not report specific data points (Refinitive Eikon, 2021).

2.4 Growth At a Reasonable Price

Growth At a Reasonable Price (GARP) is an investment strategy where investors seek growth stocks with higher expected growth of earnings than the average (Harvey, 1998). By anticipating higher earnings, the market values these stocks higher than average multiples of earnings, sales, and book value stocks (Harvey, 1998). Damodaran (2012) describes growth investors as investors who invest in companies based on how the market values their growth potential rather than existing values. Growth investors care just as much about value as other investors do; the key difference lies in where the focuses for finding values are (Damodaran, 2012).

Peter Lynch, a mutual fund manager and a well-known investor, wrote about formulas for valuing stocks in relation to their growth rate in his book "One Up on Wall Street" (2000). Lynch (2000) introduced the Price to Earnings to Growth (PEG) ratio, which divides the P/E ratio with the projected growth rate of future earnings. Many investors believe that this gives a more complete picture of a company's value than only looking at the P/E ratio, since it also includes the future growth (Damodaran, 2012). Previous studies find that GARP investing remains a profitable investment strategy and that it also extends its reach beyond the domain of growth stocks (Schatzberg and Vora, 2009; Ahmed and Nanda, 2001). The primary screen for GARP stocks is the PEG ratio, and GARP investors should avoid companies with above-average debt-to-equity ratio and below-average return-on-equity (Standard & Poor's, 2021). According to the GARP investment strategy, the growth rate should positively impact the market value of a company. If investors believe that ESG companies have better growth opportunities in the long run, this could explain a higher market value for ESG companies.

2.5 ESG, Financial Performance and Market Valuation

Historically, many studies have been conducted to find a relationship between ESG and Corporate Financial Performance (CFP). In a study by Friede, Busch, and Bassen (2015), they created an extensive academic research on this topic by extracting all primary and secondary data of previous academic review studies. When reduced for overlaps, their sample is a net of more than 2 200 unique empirical studies. The studies used were from 1982 to 2015, and the number of available studies increased sufficiently during this period. Their research shows that the majority of the studies had a positive finding between the relation, and that the positive impact of ESG on CFP seems to be stable over time.

In an article written about the role of disclosure on ESG performance and market valuation by Fatemi et al. (2017), earlier studies are described as several attempts to measure the impact of ESG factors on performance and market valuation. Although extensively investigated, they conclude that the results and conclusions from these studies are far from unanimous. Many recent studies find that ESG activities have the potential to increase market valuation (e.g., Fatemi, Fooladi, & Tehranian, 2015; Malik, 2015; Porter, 1991; Porter & Kramer, 2011; Porter & van der Linde, 1995; Roberts, 2004, cited in Fatemi et al., 2017), and a meta-analysis from 2009 found the overall effect to be positive (Margolis et al. 2009, cited in Fatemi et al., 2017). Over the last two decades, several companies have intensified their ESG reporting to be legitimate and improve their reputation (Fatemi et al., 2017).

The hypothesis in the article from Fatemi et al. (2017) is that the role of disclosure moderates the association between ESG activities and market valuation. They believe that disclosure might be expected to have a positive effect because of the reduced information asymmetry that helps investors understand ESG strengths and weaknesses of companies. Contrarily, disclosure can have a negative impact on market valuation if investors believe it is “cheap talk” or “greenwashing”, thus giving out misleading information and conveying a false impression. Their finding is that disclosure has different effects for companies with ESG strengths and ESG concerns. Companies with ESG concerns benefit from an increased disclosure, while companies with ESG strengths experience a lower additional effect on valuation when increasing the efforts on disclosure. The study is conducted using a two-stage least square regression model (Fatemi et al., 2017). The first stage in their regression describes the determinants of company disclosure on ESG activities, and this is done using interaction terms.

The second stage in the regression is the main focus and describes the relationship between the market valuation and ESG performance and disclosure. The usage of regression models, interaction terms and market value as the dependent variable is also applied to this study. The proxy for size and control for leverage is conducted in the same way as the study from Fatemi et al. (2017).

2.6 Foundations of ESG Investing

A study from Giese et al. (2019) focuses on understanding how ESG characteristics lead to financially significant results. The study created three types of "transmission channels" based on the standard discounted cash flow (DCF) model. These channels were based on rationales about ESG-rated companies and were divided into the cash-flow channel, idiosyncratic risk channel and the valuation channel. These were tested using the MSCI ESG ratings and financial variables to find, which verifies the valuation channel, that high ESG-rated companies tend to have less systematic volatility, lower beta values, and higher market valuations. Studies from Eccles (2011), El Ghoul et al. (2011) and Gregory et al. (2014) argue, through a transmission process, that a strong ESG position affects valuations by first leading to lower systematic risk and secondly a lower cost of capital (Giese et al., 2019). Further, this tends to lead to a higher market value. For example, they mention that energy or commodity-efficient firms have lower risk when exposed to energy or commodity prices, and therefore the share prices of these companies typically show less systematic risk. Lower systematic risk is equal to lower beta for company equity, for which investors will require a lower rate of return (Giese et al., 2019). This implies a lower cost of capital for the company, and in a DCF framework, a lower cost of capital suggests a higher valuation. In addition, the article also provides evidence for what they call the ESG momentum, which is the finding of how ESG rating changes on its own can change financial variables and performance (Giese et al., 2019). Because of the effect that systematic risk has on valuation, according to their findings, the regression model in this thesis will control for beta values. The ESG effect will also be included as a control variable on its own due to the described ESG momentum.

2.7 Integrating ESG into Valuations Models

In an article published by Willem Schramade (2016), a Value-Driver Adjustment (VDA) approach is developed by linking ESG issues to value drivers through their impact on business models. Thus, integrating ESG into the valuation by adjusting the value drivers. For example, suppose a company has a competitive edge from an ESG issue. In that case, this should affect the value drivers positively (like higher revenue growth or higher margins), which further should affect the return on invested capital and the market valuation (Schramade, 2016). The screening of companies to this study was conducted by searching for companies with a strong ESG profile. The study's initial results found that, on average, 5% of the target price was affected by ESG factors. This concludes that a positive valuation change from ESG impacts the valuations in most cases. The value drivers that were adjusted the most when integrating ESG factors in the study were the profit margins (46% of all cases) and revenue growth (35% of all cases). The ratio of upward to downward adjustments of the revenue growth was 5.4, which shows that revenue growth adjustments were positive in the majority of cases. The most frequent ESG issues used in the VDA approach wer innovation management and corporate governance (Schramade, 2016). The effect of ESG on the growth of revenue studied through this methodology leads to the interest of further evaluating this in a larger context. By connecting revenue growth to ESG values, the next chapter describes the method for testing if revenue growth is higher valued in companies with high ESG scores.

3. Method

Below, the method is explained as well as some methodological concerns. To examine if there is a positive relationship between the market valuation of ESG companies and the growth rate of revenue, this study is conducted using a quantitative method. This is the most appropriate method since the study incorporates a large set of data that needs to be processed and analysed (Patel and Davidson, 2016). The data is collected from Rifinitive Eikon, on which a regression model is based. The data output and regression model are processed through STATA, which provides information to test the null hypothesis.

3.1 Model Specification

To evaluate the relation between the dependent variable and the variable of interest, regression analysis is an appropriate method to use. This has been done in earlier studies with similar approaches and research questions. An example is in the article from Fatemi et al. (2017) and their study on ESG and disclosure, which also identify several earlier studies conducted in similar ways.

The input to the regression model consists of panel data, which contains several companies (i) with different observations over time (t). Panel data consists of both cross-sectional and time-series data and has the advantage of controlling for heterogeneity and creating more efficient estimation through the possibility of exploiting greater variability (Croissant and Millo, 2019). Panel data also alleviates the problem with multicollinearity, which is the chance that the variables are highly correlated, and reduces estimation bias (Croissant and Millo, 2019). Panel data may be balanced or unbalanced, depending on the availability of values on all variables each year (Das, 2019).

There are different methods for estimating panel data, and the most frequently used are the fixed effects model and the random effects model (Sheytanova, 2014). Both models are tested in the study, and a Hausman test is performed to decide on what model provides the most valid estimates and relevant results. Sheytanova (2014) presents that the fixed effects model has no constant term but instead a fixed part, α, that is unique for each company and constant over time. In the random effect model, the firm-specific part, α, is not estimated, and all variables

are considered to be random. Further, the Hausman test is useful when comparing estimates of the fixed- and random effects model and identifying the endogeneity of the explanatory variables. If there is a correlation between the error term and the random effects model, then, according to Sheytanova (2014), the fixed effects model should be preferred. Thus, the null hypothesis of the Hausman test is that the appropriate model is the random effects model. The alternative hypothesis is that the fixed effects model is suitable since there is a significant correlation between the error term and the independent variables in the panel data.

The regression model is as follows:

$$Log(MV)_{it} = \beta 0 + \gamma 0 ESG_{it} + \beta 1 GrR_{it} + \gamma 1 (ESG * GrR)_{it} + \beta 2 Log(YR)_{it} + \beta 3 Log(NP)_{it} + \beta 4 Log(DpS)_{it} + \beta 5 Be_{it} + \beta 7 Log(DtE)_{it} + \gamma 2 Ind_i + \gamma 3 Cty_i + \varepsilon_{it}$$

In the model, ESG*GrR is an interaction term to study if the growth rate of revenue is valued differently in ESG companies than in non-ESG companies. Further, the variables are explained in the section below. Everything that affects the market value that is not included in the regressors is accounted for in the error term, ε.

3.2 Variables

The dependent variable in the regression model is the company market value. The growth rate of revenue is chosen as the variable of interest in combination with an ESG dummy. The motivation for selecting the growth rate of revenue, instead of, for example, the growth rate of earnings, is that revenues generally are thought to be more difficult to manage than expenses, which affects the earnings (Ghosh, Gu and Jain, 2005). Therefore, revenue growth could not increase by temporary cost reductions and accounting principles to the same extent as earnings growth (Ghosh et al., 2005). Hence, the explanatory variable and variable of interest is the growth rate of revenue in interaction with an ESG dummy.

ESG company is included as a dummy variable that equals 1 if the company reaches the proxy for classification of ESG companies and otherwise equals 0. As a proxy for ESG companies, Refinitive Eikons ESG scores are used. To achieve the classification as an ESG company in the study, the company must have a score of >75 out of 100. Setting a strict line for the classification entails that it could emerge noise and measurement errors around the breaking

point. ESG scores for each year have been used, and it may vary if a company is classified as an ESG company over the years. However, this benchmark is used to make the classification in a consistent way.

The regression model must contain control variables in addition to the dependent variable and the variable of interest. Without the control variables, the model cannot accurately measure the effect of the variable of interest (Clarke, 2005; Angrist and Pischke, 2009). Some variables that are not of economic interest have to be included to avoid omitted variable bias in the estimation of the coefficient. Therefore, the model includes relevant control variables to reduce the risk of omitted variable bias in the model. The variables are described in Table 1.

The companies in the sample are categorised in different industries, and the regression model includes multiple dummy variables to capture the industry differences (Jaggia and Kelly, 2016). Examples of differences among industries that could bias the model are the relation between the companies' book value and market value, or different industry-specific ways of working with sustainability. In several previous similar studies, industry specifications have also been included through multiple dummy variables (Baboukardos, 2017; Grewal, Riedl and Serafeim, 2019). The industry classification benchmark used in the model is provided by FTSE Russell (2020), which provides a detailed and comprehensive structure for the sector and industry analysis.

In order to capture nonlinearities between the dependent variable and other variables, Jaggia and Kelly (2016) describe that the method of natural logarithm is used. Skewed data could be problematic to work with in a regression analysis, since it puts too much weight on extreme values and makes the linearity less suitable for all of the data points in the sample (Jaggia and Kelly, 2016). To deal with skewed data, the method of the natural logarithm is commonly used. Therefore, the variables that were not normally distributed have been transformed into logarithmic values to capture a more valid result of the model. The variables included in the regression model are presented in Table 1 and explained below.

Table 1 Variables

Variable	Description	Type
LogMV	Market value	Dependent
GrR	Growth rate of revenue	Explanatory
ESG	ESG company	Control / Dummy
LogYR	Yearly revenue	Control
LogNP	Net profit	Control
LogDpS	Dividend per share	Control
Be	Beta	Control
LogDtE	Debt to equity ratio	Control
Ind	Industry affiliation	Control / Dummy
Cty	Country	Control / Dummy

Market value

Market value is the dependent variable in the model in order to study the valuation effect of the variable of interest. The variable is based on the historical share prices for the last day of each year between 2017 and 2020, multiplied by the number of outstanding shares of each company.

Growth rate of revenue

The growth rate of revenue is the variable of interest and is the year over year percentage change for each company's revenues. It is collected through Refinitiv Eikon, where it is calculated by taking the difference between the two following fiscal years, divided by the first of the two.

ESG company

ESG company is included as a dummy variable. As mentioned previously, the dummy variable equals 1 if the company reaches our classification for ESG companies and otherwise equals 0. Scores have been collected for each fiscal year of the study, which entails that the dummy variable for each company may vary over the years.

Yearly revenue

The yearly revenue is included in the model as a proxy for the size of the companies. It is important to control for a company's size since this is a factor that influences the market valuation. The yearly revenue has been collected for each company of each fiscal year of the study.

Net profit

Net profit is also assumed to influence the dependent variable and is therefore essential to control for in the regression model. Net profit can be paid out as dividends to shareholders or get reinvested in the company, which either way can affect the market valuation. Similar to yearly revenue, net profit has also been collected for each company of each fiscal year.

Dividend per share

The dividend per share is included as a control variable in the model. It is the sum of declared dividends issued by a company for every ordinary share outstanding, and collected for every company and each year.

Beta

Beta measures the volatility of an individual stock compared to the systematic risk of the entire market. Controlling for beta in the model is important since it provides insight into the level of risk in each company relative to the rest of the market, which affects the market valuation of the company.

Debt to equity ratio

The debt to equity ratio measures a company's debt relative to the value of its net assets, and could be explained as the degree to which a company is financing its operations through debt versus owned funds. A higher leverage level of a company's assets indicates a higher risk in the valuation and is therefore important to control for in the regression model.

Industry affiliation

Industry affiliation is included as a dummy to account for industry-specific differences that could influence the market value. The companies in the sample have been categorised by the FTSE Russell benchmark for industries to control for the effect of industry-specific omitted variable bias.

Country affiliation

Country affiliation is also included as a dummy variable. When focusing on more than one specific market or region, it is important to control for country-specific differences that could affect market value.

3.3 Explaining the Regression Results and Significance Level

Running the regression model gives statistical p-values for each coefficient. The p-value needs to be smaller than the chosen significance level to consider the coefficients to be statistically significant (Jaggia and Kelly, 2016). If statistical significance between the dependent and independent variable can be proven, Jaggia and Kelly (2016) define that the probability of the correlation between the two variables appearing by coincidence is low enough to reject the null hypothesis. On the other hand, if statistical significance between the dependent and independent variables cannot be proven, the probability of the correlation appearing by coincidence is too high for the study to reject the null hypothesis.

The p-value is used to evaluate the null hypothesis in the thesis, and the test has been conducted with the significance level of 0.01, 0.05 and 0.10, respectively. Jaggia and Kelly (2016) explain the events of Type I and Type II error. Incorrectly rejecting the null hypothesis, even though it is correct, is called Type I error. The risk of Type I error is smaller if the tests are conducted at a lower significance level, which is why different levels are tested. Type II error is when an incorrect null hypothesis is not rejected. By adding a lower significance level, the risk of Type II error is increasing. Type II errors are considered less severe than Type I errors, and therefore the test has been conducted with relatively low significance levels. Using a sufficiently large sample in this thesis, the risk of Type II error decreases (Jaggia and Kelly, 2016).

3.4 Pearson Correlation Coefficient

The Pearson correlation coefficient is used to give an additional distinct interpretation of the results. The coefficients are used to summarise the data and as an input to a more advanced analysis of the data (Asuero, Sayago and González, 2006). Linear correlation between two data sets of two variables is measured for each variable and summarised in the matrix. Coefficients between +/- 0 and +/- 0.29 are considered noise, while coefficients between +/- 0.29 and +/- 1 are considered strongly correlated (Asuero et al., 2006). The coefficient is positive if there

exists a positive correlation and negative if there exists a negative correlation. The Pearson correlation coefficients are calculated by dividing the covariance of the two variables by the product of their standard deviations (Asuero et al., 2006).

3.5 Robustness Check and Validity of Results

Robustness checks are a common practice in empirical studies to create evidence for structural validity and help diagnose misspecification (Lu and White, 2013). This is made by examining how the regression coefficients estimate change when adding or removing a regressor from the regression specification. Plausible and robust coefficients in the model are evidence for structural validity. Robustness is necessary for causal inference, and coefficients of critical core variables should not be sensible to adding or dropping variables (Lu and White, 2013). A robustness check is made on the results to create validity for the regression model.

4. Data

In this chapter, the data and sources for collecting the data is presented. This is an integral part of the thesis and creates challenges that need to be considered when estimating the model.

4.1 Sample Size and Data Selection

The study uses panel data from publicly traded exchanges in Europe between 2017 and 2020. The reason for choosing the European market is to observe a sufficiently large sample to create a reliable result. The required sample size is calculated by using the formula for the sample size for population proportion (Newbold, Carlson and Thorne, 2012):

$$n = \frac{0.25\left(z_{\frac{a}{2}}\right)^2}{(ME)^2}$$

The confidence interval is 95%, the marginal error is 5%, and the sample proportion is estimated to be 0.5 (Newbold et al., 2012). The formula gives a required sample of 385 companies.

Including companies from different countries could be problematic in the model since there exist country-specific differences. Examples of these country-specific differences are regulations, currency risk, and level of mandatory disclosure. These factors could, for example, affect a company's profitability and risk, which will further affect the market valuation. However, when using ESG scores as a screening criterion, many companies fall out of the sample, making it problematic to only focus on one specific market or region to achieve a reliable sample and valid result. Therefore, country differences are controlled for in the country dummy variable.

The motivation for choosing the period 2017 to 2020 is to reflect the increased importance of ESG during recent years. The coverage of ESG scores has evolved over time, and expanding the time period to one year earlier would decrease the sample with 60 companies. Rifinitive Eikon provides an ESG company score list designed to transparently and objectively measure a company's relative ESG performance, commitment and effectiveness (Rifinitive, 2021). This

index is selected since it is well established in research and widely used by fund managers and other financial institutions. Rifinitive Eikon (2021) divides the ESG scores into four different quartiles, where the fourth quartile indicates excellent relative ESG performance and a high degree of transparency in reporting material. In order to only account for the highest ESG scores when classifying companies as ESG companies, scores within the fourth quartile are used as a proxy for ESG companies. Refintiv Eikon is further used to collect all the data points for the regression model, since this ensures that the data and the financial information have been produced in the same way. All companies in the sample must have received an ESG score every year from 2017 to 2020. An additional criterion when screening companies from Refinitiv is that the market capitalisation is positive for every year, ensuring that all companies have existed throughout the time period of 2017 to 2020.

Even though 2020 was a remarkable year due to the Covid-19 pandemic and the volatility in financial markets increased (Baker et al., 2020), this year has not been excluded from the sample. As mentioned in previous sections, the study aims to capture the increased importance of ESG in recent years, and 2020 is therefore considered important to include in the study. Nassim Taleb and Daniel Goldstein discuss the phenomenon of fat tails in their study "The Real World is More Random than Regression Analysis" (2011). They found that studies often underestimate the role of extreme events and to which extent they occur. Therefore, regression assumptions that exclude these events lead to an underestimation of real-world risk (Taleb and Goldstein, 2011).

4.2 Cleaning the Data

In Table 2 below, the number of observations for each screening criteria and the dropout after each added criterion is calculated. The last row with 455 companies is the final sample size on which the null hypothesis is tested. This number is close to the required sample from the calculations in section 4.1 and gives a data set of 1820 observations over four years in STATA that are strongly balanced.

Table 2 Sample Criterias

Screening Criteria	**Observations**	**Dropout**
Public Companies on European Exchanges	12330	
Companies with Market Capitalisation all years	8304	4026
Companies with ESG Scores 2017-2020	592	7712
Removing the Financial Sector	506	86
Adjusting for Missing Values	455	51

Some adjustments were made after the screening criteria were added in Refinitiv Eikon to receive a reliable sample. The industries within which the companies in the sample operate are basic materials, consumer discretionary, consumer staples, energy, health care, industrials, real estate, technology, telecommunication and utilities. The financial sector is excluded because of the industry-specific particularities of assets and liabilities, which might affect the relationship between market value and accounting numbers (Baboukardos, 2017; Clacher, de Ricquebourg, Hodgson 2013; Dahmash, Durand och Watson, 2009).

Further, the financial information of all the control variables for each company is added as data points to the sample made in Refinitive Eikon. This leads to the problem of missing values, and the general ways of handling missing data are by deleting or performing data imputation (Yang and Chiang, 2020). Listwise deletions can be applied when one or more variables have missing values in a row, in which case the entire row will be deleted. Imputation's methods replace missing data with substituted values and can be used if deleting introduces a substantial amount of bias (Yang and Chiang, 2020). Accordingly, imputation methods are proven to be effective when handling time series data. A commonly used method is LOCF and NOCB, which stands for Last Observation Carried Forward and Next Observation Carried Backward. This replaces the missing values with either the last observed non-missing value or the next non-missing value. If the data has small gaps of continuous missing values, Yang and Chiang (2020) state that this method can be used without creating significant errors. In the data set of

this thesis, LOCF is used on rows that contain few missing values and has similar values of the variables over the years. Other rows are deleted since estimation is considered to be complicated.

The method of regression analysis assumes that the data that is analysed is normally distributed. Therefore, eventual outliers could make the model less reliable since the data will be less normally distributed and could give misleading results (Ghosh and Vogt, 2012). To handle outliers in the data sample, the method of winsorizing has been used, assigning outliers less weight by modifying their values to be closer to the other values in the sample (Ghosh and Vogt, 2012). Thus, handling outliers with winsorizing does not exclude data points. The values that fall outside the decided percentage winsorizing of the distribution are set to the same value as the end of the limit on each side of the tails. The choice of using a 98-percent winsorizing is based on methods from a similar study by Lins, Servaes and Tamayo (2017). Using a 98-percent winsorizing means that the data outside the first percentile are set to the same value as the first percentile, and the sample outside the 99th percentile are set to the same value as the 99th percentile (Ghosh and Vogt, 2012).

4.3 Dropout Analysis

The dropout of companies from "companies with a market capitalisation 2017-2020" to "companies with ESG scores from 2017-2020" is 7712 companies. This is a large dropout and a concern regarding the dataset in the thesis. The main concern with the sample is that the ESG score ranking system is relatively new and lacks scores for many companies in the European markets. Smaller companies often do not receive an ESG score, since it is considered harder to identify the relevant numbers and calculations from smaller companies that lack disclosure and tend to report less data (Refinitiv, 2021).

The lack of disclosure affects the magnitude of ESG scores, leading to the sample not including smaller companies to the same extent as large companies. After cleaning the data, the companies that remain in the sample have a market value between EUR 67.24 million and EUR 203.19 billion. Therefore, the study cannot capture the effect of smaller companies that could be classified as typical ESG companies. The dropout of companies when adjusting for missing values is not considered to affect the results or the validity of the study due to the large sample.

All four-yearly observations of a company are deleted even if the missing value or values occurred only in one time period to create a strongly balanced regression in STATA.

4.4 Descriptive Statistics

Table 3 provides an overview of the data used in the analysis and presents the descriptive statistics for the variables in the regression model. The data for the variables market value, yearly revenue, net profit and dividend have all been collected in millions of SEK before being transformed into logarithmic values.

Table 3 Descriptive Statistics

Variable	**Name**	**Observations**	**Mean**	**Std.Dev.**	**Variance**	**min**	**max**
LogMV	Market value	1820	10.8498	1.3985	1.9558	7.7218	14.16352
GrR	Growth rate of revenue	1820	2.9980	17.1061	292.6197	-54.0714	68.4571
ESG	ESG company	1820	0.2851	0.4516	0.2039	0	1
LogYR	Yearly revenue	1820	10.4460	1.5316	2.3459	6.9579	13.7819
LogNP	Net profit	1820	7.9239	1.4563	2.1208	1.4650	11.3104
LogDpS	Dividend per share	1820	1.8072	1.1890	1.4137	0	5.3423
Be	Beta	1820	0.9346	0.4458	0.1988	-0.0212	2.3950
LogDtE	Debt to equity ratio	1820	3.8955	1.3697	1.8761	0	6.4516
Ind	Industry affiliation	1820	3.8109	2.5964	6.7416	0	9
Cty	Country	1820	12.9780	7.3036	53.3431	0	20

5. Empirical Results

This section presents the results of the regression output and will provide the thesis with an answer to the test of the null hypothesis. The results from the random effects model and fixed effects model are presented and compared through the Hausman test. Some tests on the validity of the results are also reported.

5.1 Correlation Matrix

The results from the Pearson correlation coefficients are presented in Table 4.

Table 4 Pearson Correlation Coefficients

Var.	LogMV	GrR	ESG	LogYR	LogNP	LogDpS	Be	LogDtE	Ind	Cty
LogMV	1.0000									
GrR	0.0603*	1.0000								
ESG	0.5081***	-0.0635***	1.0000							
LogYR	0.7142***	-0.1156***	0.4537***	1.0000						
LogNP	0.8570***	-0.0232	0.4841***	0.7280***	1.0000					
LogDpS	0.2574***	-0.0092	0.1437***	0.1779***	0.2165***	1.0000				
Be	-0.0526**	-0.1730***	0.0989***	0.1458***	0.0453	-0.0766***	1.0000			
LogDtE	0.0841***	-0.135***	0.1339***	0.2720***	0.1248***	0.0324	0.0688***	1.0000		
Ind	0.0266	-0.0036	-0.0717***	-0.11***	-0.0306**	-0.0092	-0.2117***	0.1002***	1.0000	
Cty	-0.1798***	-0.0311	-0.0889***	-0.2334***	-0.1636***	-0.0354	-0.0311	-0.0269***	-0.0879***	1.0000

*Note: ***,**,*denote significance at 1%, 5% and 10% respectively*.

The variables yearly revenue and net profit both strongly correlate with the market value, which is not surprising since those variables highly influence a company's market value. The dummy variable ESG also has a strong correlation with yearly revenue, which is a proxy for size in the thesis. Additionally, the correlation matrix finds that the growth rate of revenue and ESG dummy have a negative correlation at a 1% significance level, which indicates that ESG companies could have a lower growth rate of revenue than non-ESG companies. However, the correlation matrix tests only the correlation between two variables without considering effects from other variables, which means that it is only used as an overview and indication of trends without drawing conclusions about the regression result.

5.2 Main Results and Regression Analysis

The results from the regression model can be interpreted as; for one unit increase in the percentage growth of revenue (everything else held constant), the market value of the company changes, in percent, with the GrR coefficient multiplied by 100 (Jaggia and Kelly, 2016). The variable of interest adds an additional effect of the unit increase and can be interpreted as; if the company is classified as an ESG company, then the additional effect on the market value is, in percentage, the ESG*GrR coefficient multiplied by 100 (Jaggia and Kelly, 2016). Table 5 and Table 6 present the outcome from the random effects model and the fixed effect model. As explained in section 3, the test can be interpreted with different significance levels, which affects the risk of type-I error.

Table 5 Random Effects

LogMV	**Coef.**	**Std. Err.**	**z**	**P > | z |**	**[95% Conf.**	**Interval]**
ESG	0.1112	0.0354	3.14	0.002***	0.0417	0.1806
GrR	0.0041	0.0006	6.47	0.000***	0.028	0.0053
ESG*GrR	-0.0013	0.0012	-1.14	0.255	-0.0038	0.0010
LogYR	0.4879	0.0323	20.71	0.000***	0.4417	0.5340
LogNP	0.1516	0.0152	9.94	0.000***	0.1217	0.1815
LogDpS	0.1840	0.0135	9.11	0.000***	0.14444	0.2236
Be	-0.0668	0.0306	-2.18	0.029**	-0.1269	-0.0066
LogDtE	0.0065	0.0135	0.48	0.629	-0.0199	0.0330
Ind	0.0451	0.0125	3.75	0.000***	0.0215	0.0688
Cty	0.0060	0.0043	1.38	0.169	-0.0025	0.0146
_cons	3.9809	0.2446	16.27	0.000***	3.5015	4.4604

Note: ***,**,*denote significance at 1%, 5% and 10% respectively.

From Table 5 with random effects, it can be interpreted that the coefficient for ESG*GrR is slightly negative with an effect of -0.13% on the market value. This implies that for a one-unit increase in the percentage growth of revenue, the market value would change with -0.13% for an ESG company. However, the p-value for the coefficient is 0.255 and therefore non-significant at all three significance levels. This indicates that the probability that the correlation between the dependent variable and variable of interest appeared by coincidence is too high to reject the null hypothesis.

Table 6 Fixed Effects

LogMV	Coef.	Std. Err.	t	P > | t |	[95% Conf. Interval]	
ESG	-0.0323	0.0348	-0.93	0.353	-0.1007	0.0359
GrR	0.0032	0.0006	5.12	0.000***	0.0020	0.0044
ESG*GrR	-0.0015	0.0012	-1.37	0.171	-0.0038	0.0006
LogYR	0.3940	0.0474	8.31	0.000***	0.3009	0.4870
LogNP	0.0342	0.0152	2.25	0.024**	0.0044	0.0641
LogDpS	0.1731	0.0235	7.37	0.000***	0.1270	0.2192
Be	-0.0819	0.0294	-2.78	0.006***	-0.1397	-0.0241
LogDtE	0.0286	0.0148	1.99	0.047**	0.0004	0.0568
Ind	0 (omitted)					
Cty	0 (omitted)					
_cons	6.1639	0.4764	12.94	0.000***	5.2292	7.0986

Note: ***,**,* denote significance at 1%, 5% and 10% respectively.

From Table 6 with fixed effects, it can also be interpreted that the coefficient for ESG*GrR is slightly negative, with the effect of -0.15% on the market valuation of ESG companies. The p-value for this coefficient is 0.171; hence the fixed effects model also shows non-significant results at all three significance levels.

There are two possible reasons for non-significant results. One is that the null hypothesis is true and that there is no real difference in the effect of the growth rate of revenue in ESG companies compared to non-ESG companies. The other is that the alternative hypothesis could be true but that the study lacks evidence to support it. Rather than concluding that the null hypothesis is true, the possibility of not having enough evidence to reject it must be considered. This possibility is the Type II error. Alongside the alternative that there is no real effect, Visentin, Cleary and Hunt (2019) write about three reasons that should be considered when evaluating the reasons for Type II errors. These three reasons are the following: the "true" effect size is too small, the variation in the groups is too large, or the sample is too small.

The effect size and sample variation are difficult to control when estimating the model (Visentin et al., 2019). However, the sample size is considered sufficient in the study since the required sample of companies is calculated from the formula in section 4.1. In order to test the validity of the regression, robustness checks are conducted in the next section. The effect size

is -0.0013 in the random effects model and -0.0015 in the fixed effects model. This could be considered a small effect on market valuation and could, hence, be an explanation for the non-significant results.

The Hausman test was performed to determine whether the random effects model or fixed effects model gave the best fit to the regression model (see Appendix A). The null hypothesis of the Hausman test, stating that the random effects should be used, gave the p-value of 0.000, which is statistically significant. Thus, the null hypothesis is rejected, and the fixed effects model is preferred (Sheytanova, 2014). However, since both models gave non-significant results, the choice of the model does not affect the main results. When interpreting the coefficients from the other variables, one thing that does differ between the models is the effect from ESG on its own on the market valuation. This effect is negative in the fixed effects model, although not statistically significant at any of the three levels. However, when using the random effects model, the effect of ESG on market valuation is positively significant at a 1% level. Thus, this would have confirmed the ESG momentum described in the article from MSCI regarding ESG Investing and the results from earlier studies (Giese et al., 2019; Fatemi et al., 2017).

From the main regression results, the null hypothesis cannot be rejected, and it is not possible to conclude anything about a difference for ESG companies in the relation between market valuation and growth rate of revenue. Hence, these results cannot explain why ESG companies tend to trade at higher multiples. According to the efficient market hypothesis, prices should reflect all available information. The results from the model show that the growth rate of revenue cannot be proven to explain differences in the market valuation of ESG and non-ESG companies. According to the price discovery theory, high demand for ESG companies could explain a higher market value. However, the increased demand for sustainable investing and higher multiple trading cannot be proven to be motivated by the growth rate of revenue. The result does not contradict that higher demand could drive valuations, but it cannot be concluded from the thesis results.

The hypothesis of the thesis is built on the relation between the growth rate of revenue and market valuation. Although there is no significant difference for ESG companies, the results show that the coefficient for the growth rate of revenue has a positive effect on market valuation, which is statistically significant in both the random effects and fixed effects model.

These results can also confirm the theory of the efficient market hypothesis (Fama, 1970). A higher growth rate of revenue should, keeping everything else equal, lead to a higher valuation of companies. This relation is also confirmed by the investor strategy GARP, where higher valuation can be explained with a higher growth rate and thus be taken into account when valuing companies. However, when interpreting the main results, the GARP investor strategy perspective cannot explain why ESG companies tend to be higher valued by investors and trade at higher multiples.

5.3 Robustness and Validity of the Results

Several robustness checks are made to test the robustness of the regression. The first test is done by adding an additional variable to the regression model. Earlier studies have controlled for return on assets (ROA) on company value (Fatemi et al., 2017); thus, this variable is added into the fixed effects model. Adding this variable shows similar main results and does not significantly change the regression output (see Appendix B).

A second test is made by removing a variable from the regression model. This test is conducted two times by removing two different variables. These variables are debt to equity and net profit, which are chosen because these two did not receive a significant coefficient on a 1% level. When removing the variables from the regression model at different times, the main results are continuously similar, and neither changes the regression output significantly (see Appendix C).

Further, robustness checks on time periods are conducted to adjust for different years. One test is made by removing the year 2017 to control for increasing demand for ESG and evaluate if there is a change when dropping the earliest year in the sample. Another test is made by removing the year 2020 to evaluate if the effect of the Covid-19 pandemic changes the results. The results show no significant difference in the regression output when adjusting for the years in two different regressions (see Appendix D). What does change, when removing one year, is that fewer variables receive significant coefficients. This implies that the sample should consist of all years between 2017 and 2020. The fact that none of the robustness checks did change the main results of the thesis creates validity for the regression results.

6. Discussion

This section provides a discussion on the results and aims to summarise and generalise the regression results. This part also contributes to proposals for future research.

6.1 Discussion on Main Results

As could be seen in the correlation matrix, company size has a positive correlation with ESG. This could be explained by the information about Refinitive Eikon's ESG score mentioned in chapter 4. In the scoring system, transparency is also taken into account, and companies with better disclosure will receive a higher ESG score than companies that do not report on specific data points. As mentioned in section 2.3, the EU law requires that large companies disclose information about environmental and social challenges. Smaller companies tend to report less data, and therefore it is not surprising that there is a correlation between ESG and company size. Based on this, a possible explanation of the main results could be that large companies tend to have lower percentage growth. This is confirmed by the correlation matrix, which shows a significant negative relation between company size and the growth rate of revenue. If ESG companies in the sample include primarily large companies, the growth rate of revenue will also be lower, which thereby could explain why growth in ESG companies is not higher valued than in non-ESG companies. This also exemplifies the described methodology concern regarding the lack of ESG score on smaller companies, that the thesis is unable to capture the valuation effect of growth in smaller sustainable companies.

Introduced in the theory section 2.7, the study using the Value-Driver Approach found that there often was a positive market valuation change from the impact of ESG. The fact that revenue growth was the second most positively adjusted variable is interesting when evaluating the regression model results in this thesis. The previous study shows the opposite effect from revenue growth on market valuation than this study does. Therefore, it would be interesting to evaluate further the differences in the methods of the studies that produce contradictory results.

It cannot be stated that increased demand for ESG companies is dependent on the growth of revenue in these companies, even though theories and previous research suggests that ESG

tends to be treated as a long-term investment with growth opportunities. On a general level, the thesis shows that the growth rate of revenue is not something that can motivate valuations in ESG companies. Increased demand and interest among investors for sustainable investing and ESG is not explained from the studied variable of interest. This needs to be further studied in order to say something about a potential relationship.

6.2 Suggestion for Future Research

The different available ESG score systems will probably develop and expand to include more companies and especially a larger part of smaller companies. Hence, when data availability makes it possible, it would be interesting to conduct the same study with a sample that captures a more considerable extent of smaller companies. The use of ESG scores to measure the level of sustainability in companies could also be replaced with other classification systems that might make it easier to compare companies with different sizes.

Since this study resulted in a non-significant result, a study with the same focus but on another market or region would be interesting to conduct to evaluate if the result in this study is generalisable. It would be interesting to use an even broader global perspective to test if that would provide different or significant results. Lastly, it would be interesting to research any other possible variables that might differ in the market valuations of ESG companies compared to non-ESG companies. The high demand for sustainable investments and increased capital flows to ESG companies needs to be further analysed to provide an explanation for the valuation of these companies.

7. Conclusion

Because of the long-term aspect of sustainable investments and the growth opportunities that investors might expect in ESG companies, the study was conducted to evaluate if there exists a difference in the market valuation of the growth rate of revenue for ESG companies compared to non-ESG companies. The thesis complements existing research by focusing on a specific variable, growth rate of revenue, and if this variable can explain higher market valuations in ESG companies.

From the regression results, the null hypothesis cannot be rejected, and it is not possible to conclude anything about a difference in the market valuations of the growth rate of revenue in ESG-companies compared to non-ESG companies. Because of the non-significant regression results, we do not have enough evidence to reject the null hypothesis. The validity of the non-significant result has further been tested through multiple robustness tests, which all validate the non-significant effect in the model.

The correlation matrix in section 5.1 shows that ESG and yearly revenue, used as a proxy for size, have a strong positive correlation. Contrary, there exists a negative correlation between yearly revenue and the growth rate of revenue. These two correlations would have strengthened the results of a slightly negative relationship between the market valuation and growth rate of revenue in ESG companies, in both the fixed effects model and the random effects model. The authors of the thesis would, once more, like to emphasise that this relation could not be found significant in the study and hence, further studies have to be conducted before it is possible to conclude anything about potential differences. Perhaps using another classification system that includes smaller companies to a larger extent would change the non-significant results, an intriguing task the authors hand over to future researchers. The problem of understanding what factors that drive the market valuations of ESG companies needs to be further evaluated to understand the increased demand and interest for sustainable companies among investors.

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Appendix A

The Hausman Test

LogMV	Coef. (b) fe	Coef. (B) re	(b-B)	sqrt(diag(V_b-V_B)) S.E
ESG	-0.0323	0.1112	-0.1435	0.0160
GrR	0.0032	0.0041	-0.0008	0.0003
ESG*GrR	-0.0015	-0.0013	-0.0001	0.0002
LogYR	0.3940	0.4879	-0.0938	0.0474
LogNP	0.0342	0.1516	-0.1173	0.0075
LogDpS	0.1731	0.1840	-0.0108	0.0167
Be	-0.0819	-0.0668	-0.0151	0.0119
LogDtE	0.0286	0.0065	0.0221	0.0086

Test: H0: difference in coefficients not systematic

chi2(8)	=	(b-B) ' ((V_b)-V_B)*(-1))(b-B)
	=	333.32
Prob>chi2	=	0.0000

Appendix B

Fixed Effects - Adding variable Return on Assets

LogMV	Coef.	Std. Err.	t	P > | t |	[95% Conf. Interval]	
ESG	-0.0327	0.0348	-0.94	0.348	-0.1010	0.0356
GrR	0.0032	0.0006	5.15	0.000***	0.0020	0.0045
ESG*GrR	-0.0015	0.0011	-1.38	0.168	-0.0037	0.0006
LogYR	0.3917	0.0476	8.22	0.000***	0.2982	0.4851
LogNP	0.0399	0.0185	2.16	0.031**	0.0036	0.0762
LogDpS	0.1769	0.0235	7.34	0.000***	0.1265	0.2188
Be	-0.0822	0.0294	-2.79	0.005***	-0.1401	-0.0244
LogDtE	0.0267	0.0148	1.80	0.072*	-0.0023	0.0558
ROA	-0.0017	0.0032	-0.54	0.589	-0.0080	0.0045
Ind	0 (omitted)					
Cty	0 (omitted)					
_cons	6.1646	0.4765	12.94	0.000***	5.2296	7.0996

Note: ***,**,* denote significance at 1%, 5% and 10% respectively.

Appendix C

Fixed Effects - Removing variable Net Profit

LogMV	Coef.	Std. Err.	t	P > | t |	[95% Conf.	Interval]
ESG	-0.0384	0.03500	-1.10	0.273	-0.1070	0.0302
GrR	0.0037	0.0005	6.53	0.000***	0.0025	0.0048
ESG*GrR	-0.0017	0.0010	-1.60	0.111	-0.0038	0.0003
LogYR	0.3845	0.0415	9.26	0.000***	0.3031	0.4660
LogDpS	0.1704	0.0213	8.00	0.000***	0.1286	0.2122
Be	-0.0994	0.0266	-3.73	0.000***	-0.1517	-0.0472
LogDtE	0.0015	0.0134	-0.11	0.910	-0.0278	0.0248
Ind	0 (omitted)					
Cty	0 (omitted)					
_cons	6.6240	0.4235	15.64	0.000***	5.7930	7.4549

Note: ***,**,* denote significance at 1%, 5% and 10% respectively.

Fixed Effects - Removing variable Debt to Equity

LogMV	Coef.	Std. Err.	t	P > | t |	[95% Conf.	Interval]
ESG	-0.0319	0.0348	-0.92	0.360	-0.1003	0.0346
GrR	0.0032	0.0006	5.07	0.000***	0.0019	0.0044
ESG*GrR	-0.0015	0.0011	-1.37	0.171	-0.0037	0.0006
LogYR	0.4138	0.0464	8.91	0.000***	0.3227	0.5049
LogNP	0.0296	0.0150	1.97	0.050**	0.0000	0.0591
LogDpS	0.1716	0.0235	7.30	0.000***	0.1255	0.2178
Be	-0.0767	0.0293	-2.61	0.009***	-0.1344	-0.0191
Ind	0 (omitted)					
Cty	0 (omitted)					
_cons	6.1024	0.4760	12.82	0.000***	5.1685	7.0363

Note: ***,**,* denote significance at 1%, 5% and 10% respectively.

Appendix D

Fixed Effects - Excluding 2017 from the sample

LogMV	Coef.	Std. Err.	t	P > | t |	[95% Conf. Interval]	
ESG	-0.0439	0.0458	-0.96	0.338	-0.1339	0.0460
GrR	0.0034	0.0007	4.62	0.000***	0.0019	0.0049
ESG*GrR	-0.0017	0.0012	-1.40	0.161	-0.0041	0.0006
LogYR	0.5631	0.0667	8.43	0.000***	0.4320	0.6942
LogNP	0.0216	0.0183	1.18	0.239	-0.0143	0.0577
LogDpS	0.1280	0.0259	4.94	0.000***	0.0772	0.1789
Be	-0.0402	0.0345	-1.17	0.224	-0.1080	0.0275
LogDtE	0.0386	0.0174	2.22	0.027**	0.0044	0.0728
Ind	0 (omitted)					
Cty	0 (omitted)					
_cons	4.4885	0.6857	6.55	0.000***	3.1423	5.8348

Note: ***,**,* denote significance at 1%, 5% and 10% respectively.

Fixed Effects - Excluding 2020 from the sample

LogMV	Coef.	Std. Err.	t	P > | t |	[95% Conf. Interval]	
ESG	-0.0102	0.0424	-0.24	0.809	-0.0936	0.0731
GrR	0.0037	0.0008	4.42	0.000***	0.0020	0.0054
ESG*GrR	-0.0024	0.0016	-1.48	0.139	-0.0057	0.0008
LogYR	0.2120	0.0584	3.63	0.000***	0.0973	0.3268
LogNP	0.0290	0.0205	1.42	0.157	-0.0112	0.0693
LogDpS	0.4058	0.0458	8.85	0.000***	0.3157	0.4958
Be	-0.0356	0.0533	-0.67	0.504	-0.1403	0.0690
LogDtE	0.0062	0.0193	0.32	0.745	-0.0316	0.0442
Ind	0 (omitted)					
Cty	0 (omitted)					
_cons	7.6577	0.5875	12.03	0.000***	6.5045	8.8110

Note: ***,**,* denote significance at 1%, 5% and 10% respectively.