KTH ROYAL INSTITUTE
OF TECHNOLOGY

EXAMENSARBETE INOM TEKNIK, *STOCKHOLM*, *SVERIGE 2021*

GRUNDNIVÅ, 15 HP

Sustainable Investments

The impact of the EU green taxonomy

VILLE ABRAHAMSSON

JULIA EKBLOM

Stockholm, Sweden 2021

Sustainable Investments –

The impact of the EU green taxonomy

Ville Abrahamsson

Julia Ekblom

Degree Projects in Applied Mathematics and Industrial Economics (15 hp)
Degree Programme in Industrial Engineering and Management (300 hp)
KTH Royal Institute of Technology year 2021
Supervisor at KTH: Ozan Öktem, Sofia Figueiredo Monteiro, Petter Dahlström, Fabian Levin
Examiner at KTH: Sigrid Källblad Nordin

TRITA-SCI-GRU 2021:314
MAT-K 2021:021

Royal Institute of Technology
School of Engineering Sciences
KTH SCI
SE-100 44 Stockholm, Sweden
URL: www.kth.se/sci

Abstract

The increasing environmental issues and the measures taken to tackle them, is a topic of high significance in today's society. In light of this, the EU is underway with developing a taxonomy classifying sustainable economic activities in hopes to raise awareness, increase transparency regarding environmental impact, and motivate investors to invest sustainable. This paper aims to examine if the taxonomy is relevant to its cause, as well as if sustainability factors can be identified with linear regression connected to growth in a company's value, which may motivate sustainable investments. Several interviews were conducted, along with the creation of a mathematical model. The conclusions drawn was that it is not viable to determine a company's growth in value using solely sustainability factors. However, the results were promising regarding the implementation of sustainability factors in more comprehensive models. Furthermore, the impact of the taxonomy was hard to predict at this time, however, the consensus of the majority of the interviews conducted with experts on the subject, is that it has potential to impact sustainable investments in the future. Future research on the taxonomy may yield results of higher interest since more comprehensive data will be available, and the impact of the taxonomy will be more concrete.

Sammanfattning

De ökande klimatförändringarna och dess åtgärder är ett viktigt ämne i dagens samhälle. I skenet av detta, håller EU på att ta fram en taxonomi som ett verktyg för att klassificera hållbara ekonomiska aktiviteter med hoppet att öka medvetenheten och transparensen kring miljöpåverkan samt motivera investerare att investera hållbart. Syftet med denna studie är att undersöka om taxonomin är relevant för sitt syfte, samt om tillväxt i ett företags marknadsvärde kan relateras till hållbarhetsfaktorer, vilket skulle kunna motivera hållbara investeringar. Flertalet intervjuer genomfördes, tillsammans med skapandet av en matematisk modell. Slutsatserna från modellen var att det inte går att bestämma ett företags värdetillväxt med enbart hållbarhetsfaktorer, däremot såg resultaten från mer omfattande modeller mer lovande ut vad det gäller detta. Vidare var taxonomins inverkan svår att förutspå vid detta tillfälle, däremot var konsensus från majoriteten av de genomförda intervjuerna att den har potential att påverka hållbara investeringar i framtiden. Framtida forskning på taxonomin kan förse mer intressanta resultat eftersom att mer omfattande uppgifter kommer att finnas tillgängligt, och effekterna av taxonomin blir mer konkreta.

Preface

The authors behind this study, specializes in two different areas within the Industrial Engineering and Management program at KTH. Ville Abrahamsson specializes within *Applied mathematics* and Julia Ekblom within *Energy Systems and Sustainable Development*. Therefore, the study will consist of separate chapters within theory, methodology and results corresponding to the subjects Sustainability and Mathematics. However, the study is interdisciplinary and the two subjects will be connected throughout the study, especially in the final discussions and conclusions. Nevertheless, if you as a reader only find one of the subjects interesting, you may of course look at the table of contents to navigate the chapters.

Authors

Julia Ekblom and Ville Abrahamsson
Industrial Management and Engineering
KTH Royal Institute of Technology

Place for Project

Stockholm, Sweden
KTH Royal Institute of Technology

Examiner

Sigrid Källblad Nordin and Per Lundqvist
KTH Royal Institute of Technology

Supervisor

Ozan Öktem and Safira Figueiredo Monteiro
Petter Dahlström and Fabian Levihn
KTH Royal Institute of Technology

Contents

1 Introduction

1.1 Background

In a time where the climate is in a downward spiral, the unions of the world come together to try to halt the degradation of our planet. One of the more recent actions taken is the implementation of the EU Action plan on Sustainable Finance.

As part of the EU Action plan on Sustainable Finance a taxonomy, i.e. a classification system, is being constructed with the intent of implementing it as a permanent regulation as of the 1:st of January 2022. The purpose of the taxonomy is to work as a tool to identify sustainable investments and sustainable financial products. The taxonomy defines a company's environmentally sustainable activities, since a company can have such a wide variety of economic activities, it is not viable to completely categorize single entities as sustainable or not. The taxonomy provides two criteria: 1. substantial contribution to at least one of the six environmental objectives defined in the regulation and 2. do no significant harm to any of the other environmental objectives. (EU Technical Expert Group on Sustainable Finance, *Spotlight on taxonomy*).

The motivation of the implementation of the green taxonomy is to give an opportunity to identify and compare necessary sustainable investments to reach a sustainable economy. A hope with the implementation, is also to motivate sustainable investments for large financial actors. Future aspirations concerning the taxonomy is that the new taxonomy will be a cornerstone for future standards and categorizations and thus, it will consequently serve as a cornerstone for several other actions in the EU Commission's Action plan on sustainable finance and growth. The taxonomy will also play a central role in the European Green Deal which aims to give the financial market an incentive to mobilize €1000 billion, since the EU has realised that public funds (therein including the Paris Agreement) will not be enough. (Finansdepartementet, 2020)

However, the taxonomy has gotten a large amount of criticism from researchers, companies and institutions from all over the union. Some critics mean that directives such as the taxonomy must be founded in scientific knowledge and facts which the taxonomy according to them is not. This group of critics includes some researchers, such as John Hassler from the Institution of International Economic Studies at Stockholm University, who mean that there are not enough grounds that argue that these actions have a significant impact on the climate. Other critics mean that the taxonomy does not completely comply with other current EU regulations and directives such as the

Renewable energy directive, but also national regulations among the union members. In December 2020, the taxonomy was open to public consultation which resulted in 46 000 points of consideration from actors of all member countries. (Kungliga IngenjörsVetenskaps Akademien, 2021)

Besides that, sustainable companies have seen a surge in growth on the stock market in recent years. This has led to an increasing number of investors leaning towards investing sustainable, not only because of the moral and environmental aspect, but also because of the return on their investments. Green investments has previously been closely connected to the ESG-criterias, which stands for environmental, social and governance. However, the ESG-criterias have not been regulated and companies have not been obliged to report according to them. Hence, concepts such as greenwashing has occured, where companies present themselves as more sustainable than they in reality are. With the introduction of the taxonomy, companies are forced to report according to the taxonomy criteria as of the 1:st of January 2022. The new taxonomy may therefore provide the market with new "winners", and new "losers" since the definition of a sustainable company will be altered and concretized. This asks the question, will the taxonomy fulfill the hopes of motivating investors to put their money in sustainable companies or is it more of an empty action?

1.2 Purpose and Problem Statement

The purpose of this study is to analyse the new EU taxonomy's impact on sustainable investments. This will be investigated from two points of view, through a mathematical perspective as well as a sustainability perspective.

The mathematical aspect of the study focuses on the impact of motivating sustainable investments with regards to sustainability factors. The study aims to investigate if growth in a company's value could be connected to reporting on sustainability factors, as will be compulsory with the implementation of the taxonomy. An aspect of the mathematical study will concern as to what extent it is possible to predict said growth with the use of *multiple linear regression* with regards to sustainability.

The sustainability aspect of the study aims to investigate sustainable investments and the relevancy of the EU taxonomy. The analysis will focus on current knowledge as well as information provided by financial market actors affected by the taxonomy, as well as a researcher on the subject and a representative from the European Commission.

The mathematical aspect of the investigation will treat the questions;

- Using multiple linear regression, is the significance in predictability sufficient when valuing growth in a companies market value with sustainability factors?
- If so, are the ESG factors connected to the taxonomy positively correlated to growth?

The sustainability aspect of the investigation will treat the question;

- In what way do different stakeholders believe that the EU taxonomy will affect sustainable investments, as well as the climate issue?

This study may prove useful to financial actors that aim to invest sustainable. It may also prove useful for further studies on the taxonomy, seeing as the research on the topic is severely limited at the present day and age.

1.3 Limitations and feasability

Since it previously has not been regulated to report on sustainable activities within the EU, the data collection has been inhibited by the fact that for a lot of companies, the data needed to carry out the study is not disclosed by the companies. Therefore, finding companies that have reported on all the criteria being observed have been difficult. Therefore, only 86 of the initial 457 observations provided by the ESG Resility Data Set are deemed sufficient for the study. While further extending the variable data with risk-ratings concerning ESG, additional companies fell out of the data because of lack of existence. This resulted in only 63 valid companies included in the research data. However, in the case of this study, the amount is deemed sufficient to be able to receive relevant results.

This study will also focus on the EU green taxonomy and sustainable investments. The analysis is limited to the European Union but it will be based on interviews from four relevant stakeholders from Swedish banks, companies and institutions. Some additional limitations will occur, as there are interview questions are based on personal attitudes or reflections towards the taxonomy. Therefore, an analysis on the interview reliability and validity will be presented later on.

The study is deemed to be feasible concerning the problem stated, however the results will be deemed as more speculative than absolute, as the taxonomy and subsequently the reporting on it, is yet to be implemented.

2 Financial and Economical Theory

This section will introduce some terms connected to businesses as a whole.

2.1 ESG

As previously stated, *ESG* stands for environmental, social and governance. This is used to map company activities regarding the below aspects, and is a helpful tool for investors in their decision making process. The *environmental* aspect of the criteria concerns factors such as waste management, energy recycling, water disposal, deforestation and bio-diversity, to name a few. The core ideas of the EU's taxonomy are based very much on the same principles as this aspect. However, according to the taxonomy, a company is obliged to report according to these activities which has not previously been required. The *social* aspect concerns issues regarding e.g. employees health and working conditions. This is not covered by the taxonomy in its current form. However, as will be discussed later on in this study, the possibility of an implementation in the taxonomy regarding concerns of this sort is a topic for future discussions. The *governence* aspect is used to measure control regarding for example briberies, money laundering and shareholders voting possibilities. (Nordea)

2.2 ESG-risk

For this study, data on several companies *ESG-risk* will be used. This is used for investors to concretely view the risk a company has on its enterprise value in connection to the ESG criteria. The measurements that will be used in this study measures an absolute magnitude of unmanaged risk, which makes it comparable between companies and industries. The data gathered in this study is based on two aspects, exposure and management. Exposure is connected to industry, for example, an oil company will be naturally exposed to environmental risk. Management is connected to the actions taken within a company to manage ESG issues, which may include policies and directions. (Sustainalytics)

2.3 Market capitalization

Another relevant piece of data that will be used is market capitalization. Market capitalization, or market cap, is calculated by taking the price of a company's stock, and multiplying it with the total number of outstanding shares. This is used when analysing

a company's size and how that reflects the investors view of the opportunities of the company. (Corporate Finance Institute)

3 Sustainability Theory

In this section, theory concerning sustainability issues connected to the taxonomy will be introduced. Theory regarding the taxonomy itself, will also be presented.

3.1 Sustainable investments

Sustainability has become a key factor in almost all economic activities and industries, much due to the expected impact from climate change on modern society. Naturally, sustainability is an important factor also in financial markets. Efforts to increase the accountability of financial markets in social and ecological issues, aims to use sustainable investments as part of the solution. As the demand for investment opportunities that contributes to solutions for the larger problems as well as reflects the broader values grows, it makes way for sustainable, or value-based investments. Sustainable investing is an investment strategy that considers ESG factors. (Gaurav & Sharma, 2019)

Even though sustainability is gaining importance for many investors, an attractive return is still the dominating factor. Therefore, the interest for understanding and comparing returns from regular and sustainable investments is high among investors. Several studies show that sustainable investments outperform conventional ones. For example, empirical studies by Friede, Busch and Bassen (2015) suggest a positive relation between ESG- and corporate financial performance. Studies by Cunha, Oliveira, Orsato, Klotzle, Cyrino Oliveira, and Caiado (2020) shows that the return of the US sustainability index was slightly lower than its market benchmark, 72,02% compared to 74,01%, but had very similar risk patterns and standard deviations. Hence, the study suggests that in the US stock market, sustainable investing may be considered as part of mainstream investment practices. However, the return of the sustainability index in Europe was slightly higher than its benchmark, 7,08% compared to 6,88%, also with very similar risk patterns. Also in emerging markets, the return of the sustainability index outperformed its market benchmark. However, critics mean that the time period for such studies often is less than 10 years meanwhile investors in sustainable investments commonly invest from a long-term perspective. Therefore, they express the need for longer time horizon studies. (Gaurav & Sharma, 2019)

Opponents argue that when considering non-financial factors such as ESG, one excludes

many investment opportunities and thereby reduces the investment universe. Thus, sustainable investments will generate lower expected risk-adjusted returns. (RBC Global Asset Management, 2019) Nevertheless, the key findings from the study by RBC Global Asset Management shows that considering corporate social responsibility in stock market portfolios do not result in financial weakness. The study also showed positive relations between strong environmental- and stock price performance and that ESG ratings within companies outperform the market in both medium (3-5 years) and long term (5-10 years). (RBC Global Asset Management, 2019)

From niche to standard practice, sustainable investing has fastly grown into a major market segment. At the start of 2018, sustainable investing assets reached 30,7 trillion dollars in the five major markets including Europe, the US, Japan, Canada and Australia/New Zealand, which was an increase of 34% since 2016. The largest sustainable investment strategy globally in 2018 was negative/exclusionary screening (19,8 trillion dollars), mainly dominating in Europe. Negative/exclusionary screening is a strategy where one based on ESG criteria excludes certain sectors, companies or practices from a fund or portfolio. The second largest strategy was ESG integration ($17,5 trillion) dominating the US, Canada, Australia and New Zealand. ESG integration means explicit and systematic inclusion of ESG factors in investment decisions and financial analysis. Third largest strategy was corporate engagement/shareholder action ($9,8 trillion), dominating in Japan. The strategy means influencing certain corporate behaviour by using shareholder power. (Global Sustainable Investment Alliance, 2018)

As social and environmental performance is a rapidly growing factor when selecting and managing financial assets, the asset owners are increasingly more keen on knowing whether companies they plan to invest in are more or less sustainable than others. However, the information declared by companies is not according to a joint standard, and also hard to verify. Often, metrics are restricted to internal business practices but limited in the external domain. The lack of available, transparent and reliable sustainability data leads to phenomena such as "green washing". (Vörösmarty, Osuna, Koehler,..., & Sánchez, 2018)

Green washing refers to a case when consumers are being misled about companies environmental performances or their products or services environmental benefits. Over the past few decades, an increasing number of companies are engaging in green washing resulting in what may be profound negative effects on investors' confidence in green products. Preventing green washing is challenging when regulations are limited and

uncertain. (Delmas & Burbano, 2011)

3.2 Sustainability reporting frameworks and standards

Historically, availability and transparency of sustainability data has been limited and lacking a standardized and comparable information of ESG factors within companies. (Swedish House of Finance) However, Schaltegger and Wagner in 2006 claimed that organisations increasingly appear open to report their ESG performance. During the past two decades, a growing number of international reporting standards and frameworks has been developed by both institutes and independent organisations, such as Global Reporting Initiative (GRI), Principles for Responsible Investments (PRI), Sustainability Accounting Standards Board (SASB) and United Nations Global Compact. (Worldfavor) In the Nordics, Resility collects data for the Nordic publicly traded companies.

One of the most recent regulations in the EU is the green taxonomy. The taxonomy is a classification system for sustainable economic activities. All financial actors, in the member states of the EU, offering financial products as well as large public-interest companies with more than 500 employees, will by law be bound to reporting according to the taxonomy. (EU Technical Expert Group on Sustainable Finance, 2020)

3.3 The EU Taxonomy

In order to carry out the ambitious 2030 climate goals, the European Union has set up numerous frameworks, one of them the European Green Deal. The European Green Deal is formed to make the EU's economy sustainable, resource-efficient, modern and competitive. This by moving towards a clean and circular economy, restoring biodiversity and cutting pollution. (European Commission, *A European Green Deal*)

As part of the European Green Deal, an action plan on sustainable finance has been implemented to further connect finance and sustainability. The action plan includes ten key actions divided into three categories, "Reorienting capital flows towards a more sustainable economy", "Mainstreaming sustainability into risk management" and "Fostering transparency and long-termism". Included in the first, is the green taxonomy as a classification system for sustainable activities. (European Commission, 2018).

The EU states that investments in sustainable projects and activities is a fundamental part in order to reach their 2030 goals. However, to be able to scale up and implement the European Green Deal, a common language with a clear definition of "sustainability" is essential. Hence, the EU created the EU taxonomy as a common classification system

for sustainable economic activities. By defining sustainability, the EU expects to establish security for investors and reduce green washing. (European Commission, *EU taxonomy for sustainable activities*)

The taxonomy is based on a binary approach meaning an economic activity is either environmentally sustainable or not. Except from fossil energy production, there are no exclusions in advance regarding which economic activities can be stated environmentally sustainable. (Regeringen, 2020)

The taxonomy was adopted in June 2020, however the adopted draft was open for public consultation until the 18th of December 2020. During the consultation, approximately 46 000 responses were submitted to the European Commission. On the 21st of April 2021, the Commission is expected to present the final delegating act which according to the regulation will be adopted on the 1st of January 2022, after discussions with the European Parliament. (Regeringen, 2020)

As stated in the background, the taxonomy regulation provides six environmental objectives and two criteria:

1. Make a substantive contribution to at least one of six environmental objectives defined in the regulation.
2. Do no significant harm to any of the other five objectives defined in the regulation.

It should also comply with minimum safeguards such as the OECD Guidelines on Multinational Enterprises and the UN Guiding Principles on Business and Human Rights. (EU Technical Expert Group on Sustainable Finance, 2020)

The six environmental objectives include:

1. Climate change mitigation
2. Climate change adaptation
3. Sustainable use and protection of water and marine resources
4. Transition to a circular economy
5. Pollution prevention and control
6. Protection and restoration of biodiversity and ecosystems

(European Commission, *EU taxonomy for sustainable activities*)

EU Technical Expert Group on Sustainable Finance states that the taxonomy regulation will apply to these three groups:

1. Financial market participants offering financial products in the EU, including occupational pension providers.
2. Large companies who are already required to provide a non-financial statement under the Non-Financial Reporting Directive. This includes large public-interest companies with more than 500 employees, including listed companies, banks and insurance companies.
3. The EU and Member States, when setting public measures, standards or labels for green financial products or green (corporate) bonds.

(EU Technical Expert Group on Sustainable Finance, 2020)

3.4 Other sustainability regulations within the EU

3.4.1 Emissions trading, the EU ETS

The EU ETS for emissions trading was introduced in 2005 as the world's first international emission tradings system. It is formed as a "cap and trade system", with a cap for the total amount of certain greenhouse gases allowed to be emitted, and the cap is reduced over time leading to reduced emissions. Within the trading system, companies receive or buy allowances that can be traded within the system. If a company does not have enough allowances to cover its emissions, it is heavily fined. On the other hand, if a company has excess allowances they can use them another year or sell them to another company. This trading system makes sure that emissions are reduced where possible and also promotes companies to invest in low-emitting technologies. (European Commission, *EU ETS*)

3.4.2 Carbon taxes in Europe

Carbon tax is implemented in 16 European countries, including the Nordic countries, Britain, France and Spain. Sweden stands out as it by far levies the highest carbon tax, 108.81 euros per ton of carbon emissions, followed by Switzerland and Liechtenstein at 90.53 euros per ton of carbon emissions. Poland levies the lowest carbon tax in the union at 0.09 euros per ton of carbon emissions. On which types of greenhouse gases carbon taxes are levied differs in the union. (Asen, 2020)

4 Mathematical Theory

In this section, the mathematical background used in the thesis will be presented.

Multiple linear regression is an established methodology to analyse the relation between influential prediction variables, and a specific response variable. For this study, the theory that will be presented in section 4 will be based on *Introduction to Linear Regression Analysis.* (Montgomery, D.C, Peck, E.A, Vining, G.G, 2012)

The multiple linear regression model below will be used to model and examine the relationship between the regressor variables β_n and the response variables y_i bearing in mind observations $x_{i,n}$.

$$y_i = \beta_0 + \beta_1 x_{1,i} + \beta_2 x_{2,i} + \beta_3 x_{3,i} + ... + \beta_k x_{k,i} + \epsilon_i$$

This model is more conveniently expressed in matrix notation since this allows a compact display of the model, data and results. In matrix notation, the model is given by

$$\mathbf{y} = \mathbf{X}\boldsymbol{\beta} + \boldsymbol{\epsilon}$$

where

$$\mathbf{y} = \begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_2 \end{bmatrix}, \mathbf{X} = \begin{bmatrix} 1 & x_{11} & x_{12} & \dots & x_{1k} \\ 1 & x_{21} & x_{22} & \dots & x_{1k} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & x_{n1} & x_{n2} & \dots & x_{nk} \end{bmatrix}, \boldsymbol{\beta} = \begin{bmatrix} \beta_0 \\ \beta_1 \\ \vdots \\ \beta_k \end{bmatrix}, \boldsymbol{\epsilon} = \begin{bmatrix} \epsilon_1 \\ \epsilon_2 \\ \vdots \\ \epsilon_n \end{bmatrix}$$

By reviewing β_i, an indication can be found on to what change in growth is made by each unit change in the observation x_i, with β_0 as the models intercept. Hence the aim is to fit the vector $\boldsymbol{\beta}$ optimally for the model. This is done by the ordinary least squares approach. However, before the theory behind the ordinary least squares approach is introduced, there are certain assumptions that must be stated, and later on examined if they are fulfilled.

4.1 General Assumptions

When working with linear regression the major assumptions are;

- The relationship between the response variable and the regressors are at least approximately linear

- The error term has zero mean
- The error term has constant variance σ^2
- The errors are uncorrelated
- The errors are normally distributed

It is important to make sure the above assumptions are sufficiently valid before using linear regression. Hence, tools such as residual analysis and residual plots will prove vital in this study to prevent misleading results.

4.2 Ordinary Least Squares

The aim is to find the least squares estimators $\hat{\boldsymbol{\beta}}$, this is done through solving the *Maximum-likelihood function*

$$\hat{\beta} = \textit{arg}\min_{\beta}(y - X\beta)'(y - X\beta)$$

that minimizes the sum of squares $S(\boldsymbol{\beta}) = \boldsymbol{\epsilon'\epsilon}$. This can then be written as

$$S(\boldsymbol{\beta}) = \sum_{i=1}^{n} |y_i - \sum_{j=1}^{p} X_{ij}\beta_j|^2 = ||\boldsymbol{y - X\beta}||^2$$

The above equation can then be simplified to

$$\boldsymbol{X'X\hat{\beta} = X'y}$$

which is the **least-squares normal equation**. Solving for $\hat{\beta}$ yields the vector of regressors $\hat{\boldsymbol{\beta}} = \boldsymbol{(X'X)^{-1}X'y}$ that best fit the model. As previously stated, each β_i will define what degree of impact the regressor has on the response variable.

In this model all observations x_i will be viewed as fixed non-random variables, however, the resulting estimate of $\hat{\beta}$ is still valid in the case of the regressors being random variables. This is important since in a observational study, as this study is, most regressors and y will be random variables. When viewed in this way, $\hat{\beta}$ may be viewed as an estimator. This view will be used in this paper.

Following this, a natural thing to study is the adequacy and significance of the estimators $\hat{\boldsymbol{\beta}}$, along with the adequacy and significance of the entire model. The testing for significance of regression concerns the issue of a linear relationship between the response

and the regressors. This is thought of as a test of the models adequacy, i.e the models predictive capabilities.

A metric that will be used to evaluate the models adequacy, i.e the models predictive capabilities, is the adjusted R^2. This is denoted as

$$R^2_{adj} = 1 - \frac{SS_R/(n-p)}{SS_T/(n-1)}$$

where $SS_T = \sum_{i=1}^{n}(y_i - \bar{y_i})^2$ is the regression sum of squares and $SS_R = \sum_{i=1}^{n}(\hat{y_i} - \bar{y_i})^2$ is the total sum of squares. The adjusted R^2 is a measure of the models and its regressors significance and adequacy. The resulting value will range between $0 \rightarrow 1$. Where a value close to one indicates satisfactory significance, whereas a value closer to zero would indicate that the model will yield poor, and perhaps erroneous results.

4.3 Transformations

In the case that certain model assumptions are not fulfilled, one may be required to perform a transformation of the concerned variables. For instance, if the general assumption that the relationship between the response variable and the regressors are approximately linear, as well as the assumption that the errors are normally distributed are not fulfilled, a suitable transformation of the response variable may be performed. When this is possible, the model is said to be intrinsically linear.

4.4 Residual Analysis

One of the most useful tools in checking for model inadequacy, is the use of residual analysis. By analysing various plots of the residuals, one can determine if the assumptions are fulfilled. Residual analysis is especially useful in examining if the means of the residuals are close to zero and have a constant variance, if the residuals are normally distributed and if there is a linear relationship between the regressors and the response variable. The premise on which this is operated on is that of the definition of the residuals. The residuals are defined as the difference between the observed value, and the fitted value, usually denoted by e_i. By plotting the residuals specified below and analysing the resulting plots, one may realize that the assumptions are not fulfilled. For example, one may detect that the residuals are in fact not normally distributed, bringing forth the need to review aspects of the model.

For further investigation in the use of residual analysis, some statements are needed.

Firstly, the residual has zero mean, $\mathbf{E}(e) = 0$. Secondly, an estimation of the variance of the residual is estimated using the *residual mean square* $MS_{Res} = \frac{SS_Res}{n-k}$. This will be used as a basis in the following scaled residuals.

4.4.1 Scaled Residuals

The residuals created from the transformation of normal residuals are commonly referred to as *scaled residuals*. The scaling of the residuals serve a multitude of purposes. For one, scaled residuals gives the opportunity to cross-examine residuals both within the model, and with different models. Secondly, certain transformations will provide useful tools in detecting outliers and extreme values. By attending to the abnormalities discovered, opportunities to improve the model are incurred.

4.4.2 Studentized Residuals

To analyse if the residuals have a mean equal to zero, one may analyse the plotted studentized residuals. While transforming the residuals to *standardized residuals*, the use of MS_{Res} or the *mean square residual*, is common. However, for more exact values, the use of the specific variance for each observation should be considered. The following equation is considered

$$e = (\mathbf{I} - \mathbf{H})\mathbf{Y}$$

Where **H** is the **hat matrix**

$$\hat{\mathbf{H}} = \mathbf{X}(\mathbf{X}'\mathbf{X})^{-1}\mathbf{X}'$$

with the properties that it is symmetric and idempotent. Now, by substituting

$$y = \boldsymbol{X\beta} + \boldsymbol{\epsilon}$$

in to the first equation, and using the hat matrix's properties, we recieve,

$$e = (\boldsymbol{I} - \boldsymbol{H})\boldsymbol{\epsilon}$$

It is noticable that the residuals have the same linear transformation for the responses **y** as they do for the errors ϵ. To obtain the specific variance per residual e_i, the covariance matrix is considered in conjunction with $Var(\epsilon) = I\sigma^2$ the variance is received as

$$Var(\mathbf{e}) = Var[(\boldsymbol{I} - \boldsymbol{H})\boldsymbol{\epsilon}] = \sigma^2(\boldsymbol{I} - \boldsymbol{H})$$

where the variance of the *i:th* residual is given by

$$Var(e_i) = \sigma^2(1 - h_{ii})$$

and the covariance between the residuals e_i and e_j is

$$Cov(e_i, e_j) = -\sigma^2 h_{ij}$$

where h_{ij} is an element in the hat matrix. Using the estimated variance of the residual, the studentized residual can now be calculated as

$$r_i = \frac{e_i}{\sqrt{MS_{Res}(1 - h_{ii})}}$$

The variance of the prediction grows the further away the observation x_i goes from $\bar{x}$ along with influencing the regression. This implies that model assumptions are more likely to be influenced by results further away. If the model is sound however, the residuals will have variance equal to one.

4.4.3 PRESS-Residuals

Prediction error sum of squares residuals are a useful tool in predicting outliers. This is done through eliminating the i:th residual, and the logic behind the theory is that if the i:th observation is influential, it will pull the regression towards it, making the residual smaller. If however, the observation is removed, the model will draw towards the more closely correlated observations and will yield a larger residual. Hence, if the i:th observation is deleted, by fitting the model to the remaining n-1 observations and calculate the predicted value of y_i, the following residual is calculated as

$$e_i = y_i - \hat{y_{(i)}}$$

This is then done for each observation *i*, it is then possible to calculate PRESS-residuals from the results of the least-squares fit to all *n* observations, and the following formula is created

$$e_{(i)} = \frac{e_i}{1 - h_{ii}}$$

A PRESS-residual with a large value will be considered influential. Furthermore, a observation where the PRESS-residual differs largely from the normal residual is an observation which fits the data well, and a model without this prediction will predict

poorly.

4.4.4 Added Variable Plots

To analyse if a variable is suitable in regards to the assumptions it is necessary to examine its linear relationship to the response variable. This is done through *Added Variable Plots*. By plotting each regressor and examining the slope yielded, one can realise that regressors impact on the model.

4.5 Handling of outliers

Outliers has previously been mentioned in this study, however not given proper explanation. Outliers are observations that differ significantly in regards to other observations. This way, outliers tend to impact the regression model more than others. There are two subsets of outliers; *influence* points, and *leverage* points.

Points with a normal x-value but with an exaggerated y-value are called influence points. These points bear a heavy impact of the modelling result, and only a few influential points can determine the whole model with little regard to the other observations

A point with a y-value that does not differ from the other observations, but the x-value is significantly different, is called a leverage point. These points may have a severe impact on properties such as R^2 and standard errors.

4.5.1 Cooks Distance

A tool to locate these outliers is one created by D. Cook, that measures the square distance between the observation and the fit. It can be interpreted as

$$D_i = \frac{r_i^2}{p} \frac{Var(\hat{y}_i)}{Var(e_i)} = \frac{r_i^2}{p} \frac{h_{ii}}{1 - h_{ii}}$$

A general thought is that values $D_i > 1$ are outliers.

The handling of outliers is one that should be performed with utmost care, since their impact on the model is immense. If the outlier is the result of an erroneous data collection, one may consider removing said observation to more accurately be able to fit a proper model. However, if there are not any proven oddities in its existence, it cannot be justified to be removed, since it may possess a significant explanatory power.

4.6 Multicollinearity

The problem of multicollinearity stems from the selection of regressors, more specifically the linear relation between the regressors. The major issue concerning multicollinearity, is that when the regressors have a *near-linear relationship*, the inferences drawn from the model could be false and misleading. To be able to identify the source of the multicollinearity, and understanding the data-set, is vital in addressing the issue.

4.6.1 Multicollinearity diagnostics, VIF

When utilizing diagnostics tools for multicollinearity, the desirable characteristics are that the diagnostic reflect the degree of the multicollinearity, and aid in the determination of which variables are linearly dependent. *Variance Inflation Factors* is a relevant method in detecting multicollinearity. By usage of the matrix $\boldsymbol{C} = (\boldsymbol{X'X})^{-1}$, specifically the diagonal elements C_{jj}. The diagonal elements can be denoted as

$$C_{jj} = (1 - R_j^2)^{-1}$$

where R_j^2 is the coefficient of determination when x_j is regressed on the remaining regressors. What may be derived from this, is that when x_j is nearly linear with the other regressors, R_j^2 goes towards 1 and C_{jj} becomes large. On the other hand, when x_j goes towards orthogonality in regards to the remaining regressors, R_j^2 becomes increasingly small, rendering C_{jj} closer to 1. Hence, the variance inflation factors can be written as

$$VIF_j = C_{jj} = (1 - R_j^2)^{-1}$$

4.6.2 Multicollinearity treatments

Some general multicollinearity treatments are *variable selection, variable elimination* and *model respecification*. These treatments are commonly used in correction for multicollinearity and they all have their benefits and disadvantages. Variable selection is a common method which will result in the ”optimal” model through processes of reviewing the previously mention VIF diagnostic, and eliminating, changing or altering the variables used. Removing or altering variables may not always be the optimal way since the variable may have a relevant explanatory property regarding the dataset. Hence, the selection is the process off reviewing the trade-off between the relevancy of the variables included, and the reliability in the models inferences.

5 Methodology

The method used to conduct the interviews, gather relevant literature to review, as well as the methodology behind the mathematical project will be presented in this section.

5.1 Sustainability methodology

5.1.1 Literature review

A literature review was conducted with the purpose to evaluate the current knowledge on sustainable investments in order to further evaluate the EU taxonomy. In the beginning of the project the literature review was intense, but it was conducted during the whole project. This to ensure that the gathered literature was continuously relevant and up to date, since little research has been made on the new taxonomy.

The literature in the review were retrieved using mainly KTHB Primo but also Google Scholar and official sites from the EU and the Swedish Government. Relevant references from the retrieved sources were also used to find literature.

5.1.2 Interviews

To further gather information and evaluate sustainable investments and the relevance of the EU taxonomy, interviews were held with several stakeholders. The stakeholders included an economic advisor from the European Commission, a professor in economics from Stockholm University, a partner from KPMG working with EU taxonomy issues, and a senior sustainability manager at one of Sweden's largest banks, Handelsbanken. The varied actors ensured different perspectives.

The disposition of the interviews held were semi-structured, to be able to vary and adapt the questions to match the person being interviewed. To make sure the answers were comparable, the interviews included some key questions. Other questions were added or dropped throughout the interviews to fit the situation and to leave room for an open discussion. The interviews were recorded, after approval, and then transcribed. This to ensure that the findings from the interviews were correctly described.

To ensure reliability and validity, interviews were held with relevant experts on the subject. The experts included several stakeholders with different perspectives, from either institutions such as Stockholm University and the European Commission, or well-respected banks and companies.

5.2 Mathematical model

For the mathematical model, the theory denoted from section 4, based on *Introduction to Linear Regression Analysis* (Montgomery, D.C, Peck, E.A, Vining, G.G, 2012), will be applied. After gathering the relevant data, the model will be fitted using the *lm()* function in the R environment. The first step will be to use an *all possible regression* approach where the model will be fitted to all the available data, with all the available variables. After the first model is fitted, investigation on whether the model is appropriate or optimal in regards to the observations and variables is necessary, where the theory presented in section 4 will be of utmost value in determining assumption fulfillment, and adequacy.

5.2.1 Data Gathering

Concerning the issue of data gathering, the first step was to investigate what matter of data on sustainability actions within companies was publicly available. Since there has not been regulations on companies to report on sustainable activities, the data available appeared lackluster. However, a realisation of earlier projects in this education lead us to a data collection called *Resility: ESG factors on nordic publicly traded companies*, provided through KTH, created by *Resility* in collaboration with the *Swedish House of Finance*. This provided data on 435 different publicly traded companies and their reports on ESG-factors throughout 2019. However, since there has been no regulation concerning the reporting of sustainability factors, the majority of the companies had several datapoints denoted as *Non-Disclosed*, meaning that there was not publicly accessible data available on certain data-points.

Therefore, after noting which variables could be considered connected to the taxonomy, applying filters to the relevant variables and excluding the companies that had not reported on them was necessary. The model would not be accurate and viable in its prediction if the missing datapoints were given any arbitrary number. The variables that were considered relevant to this study, provided by the Resility data set include

- Total energy consumption (GJ)
- Total water withdrawal (1000 cubic meter)
- Total scope 1 and 2 emissions (kilotonnes)
- Total Sales (TEur)

These were then manipulated to reflect the totals per employee to give a more just view

over the climate impact of the company. Total sales were included to examine if there could be a correlation between the sustainability factors and the productivity related to growth. These were deemed to be relevant **covariates**. After the irrelevant companies had been removed, there were only 87 relevant observations left.

Thereafter, to determine in what way incentives could be related to investments. The obvious answer was return on investment, hence, the decision that the **response variable** to be examined was the growth of a company's share prize during the course of the two years that were deemed relevant in accordance with the ESG-data provided. The share-prices for each company were gathered from Yahoo Finance, using the closing prize of the first trading day of 2019, and the corresponding prize on the last trading day of 2020. These two factors per company were then calculated as percentual growth.

To be able to correlate the companies sustainable impact and growth with their sizes, the covariate *Market Capitalization* was used, the market capitalization was gathered via Bloomberg. The currency was converted to SEK with equal value day to disregard currency fluctuations.

A company's ability to adapt and deal with the new regulations brought on by the taxonomy should be considered relevant in an investors decision making. Hence, the correlation between recent growth and risks connected to ESG-factors is relevant in the case of this study, and should be implemented in the model. *Sustainalytics*, a company owned by the acknowledged data provider *Morningstar* provides a service where their analytics determine a company's risk related to ESG, as described in section 2. The data was gathered manually for each available company, however, the availability of data occured once again as a factor. After gathering the publicly available data, and removing the companies who had not been given a rating, the study was left with 65 observations. However, for the sake of this study, it is deemed a sufficient amount to perform the regression analysis.

5.2.2 Initial Model

By using the *all possible regression* approach, the model is fitted with the variables presented in the table below

Variable	Statistic
Y	Growth
X1	Sales/Employee
X2	Water Withdrawal/Employee
X3	Total Energy Consumption/Employee
X4	Scope 1 and 2 Emissions/Employee
X5	Market Capitalization
X6	ESG-risk

6 Results

In this section the results from the empirical studies will be presented. Responses from the interviews conducted, as well as the results from the mathematical model will be reviewed.

6.1 Results from the mathematical model

In this section, the results of the efforts in analysing the initial model and improving said model will be presented.

6.1.1 Initial Model

The initial result of the model was indeed lackluster. It demonstrated an adjusted R^2 of -0.01149, giving a negligible significance for the model. The regressor variables produced also provided a lackluster result since neither presented a value that could be considered significant in deciding the response variable. Further investigation as to what might be the cause of this is necessary. Hence, residual analysis, detection of outliers, mulitcollinearity diagnostics and examination of the data will be performed in order to hopefully reach a better model.

Analysing the QQ-graph below, it is noticable that the majority of the standardized residuals may be considered normally distributed, however, the tails are somewhat unsatisfactory, yielding the result that the model may benefit from a type of transformation.

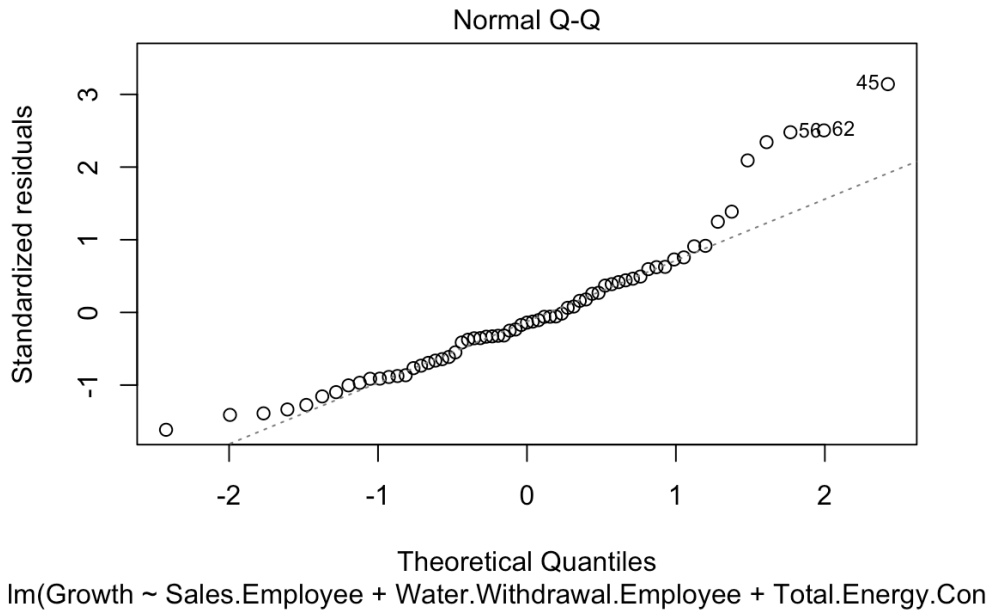

Figure 1: Normal Q-Q

Further analysis regarding the residuals is deemed necessary. Observed below are the studentized residuals, along with the PRESS-residuals.

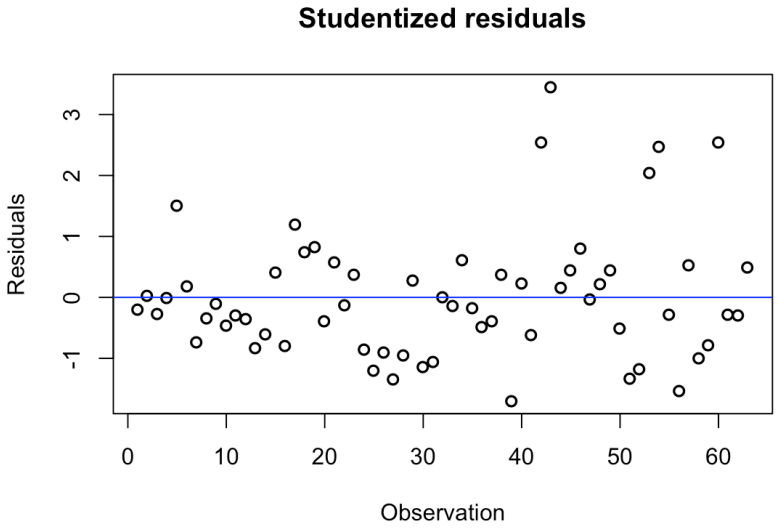

Figure 2: Studentized Residuals

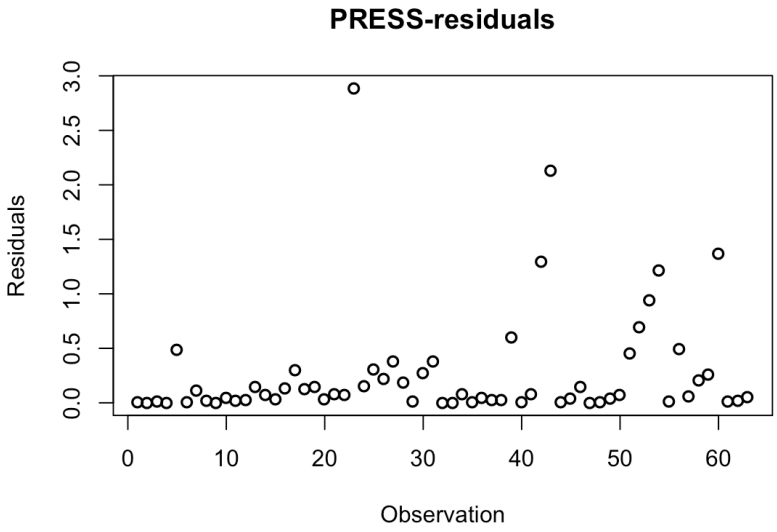

Figure 3: PRESS Residuals

The studentized residuals plotted suggest that the assumption that the residuals have a mean close to zero, could be considered fulfilled. The majority of the residuals lie close to zero, apart from a few more extreme points of data. The plot of the PRESS-residuals further strengthen the case. However, viewing the plot of the PRESS residuals, it is noticeable that there are potential outliers. A few of the observations with a higher value have a PRESS-residual that do not differ largely from its studentized residual. However, the 23:rd observation's PRESS-residual differs heavily from its studentized residual, this is a strong indicator of a highly influential point.

Using Cooks Distance, further investigation on the outliers are performed.

Figure 4: Cook's Distance

As can be observed, the 23:d observation is in fact influential as its value exceeds the general limit, $D_i > 1$, mentioned in section 4. The other observations however are deemed to be sufficiently within the limit of not having to large of an impact on the model. Further investigation as to what might be the cause of the influential point, aswell as determining if the influential point has a large enough explanatory factor to be considered relevant for the model, i.e remain unchanged.

Further evaluation of residual plots may be of use when determining if there is a linear relationship between the regressor variables and the dependent variable. Added-Variable plots, as explained in section four, is of good use in this case. As previously mentioned, the slope in the plots suggest to what degree a regressor could be considered influential, and if it has a linear relationship with the dependent variable. By reviewing the below plots, the slopes in the plots suggest that there exists a linear relationship between the dependent variable and all the regressors except *Total Energy Consumption/Employee*.

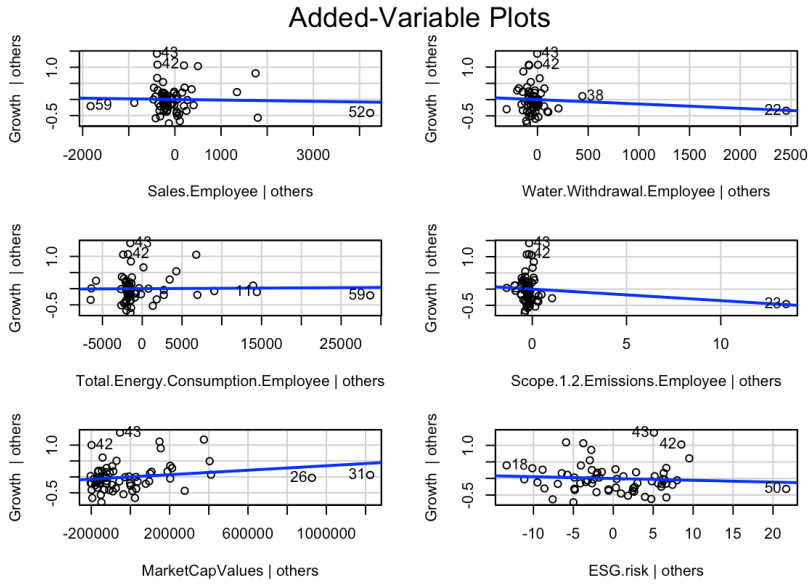

Figure 5: Added-Variable plots for the regressors

To check for variance in for the error term one last residual plot will be used.

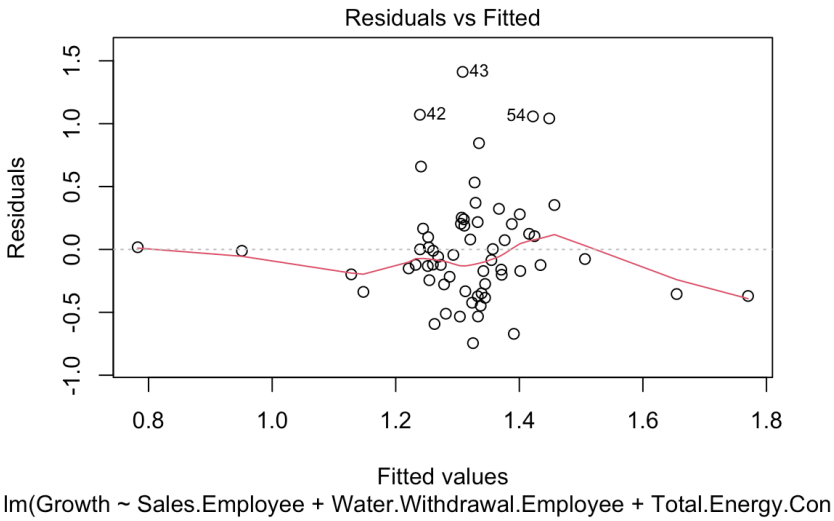

Figure 6: Residuals vs fitted values.

Viewing the above plot, an argument could be made that the variance of the error term is in fact close to constant. This because the absolute majority of the error terms may be fitted in a straight ”band” within the plot.

Lastly, it is necessary to examine the model for multicollinearity. This will be done through *Variance Inflation Factors*. The VIF, plotted below,

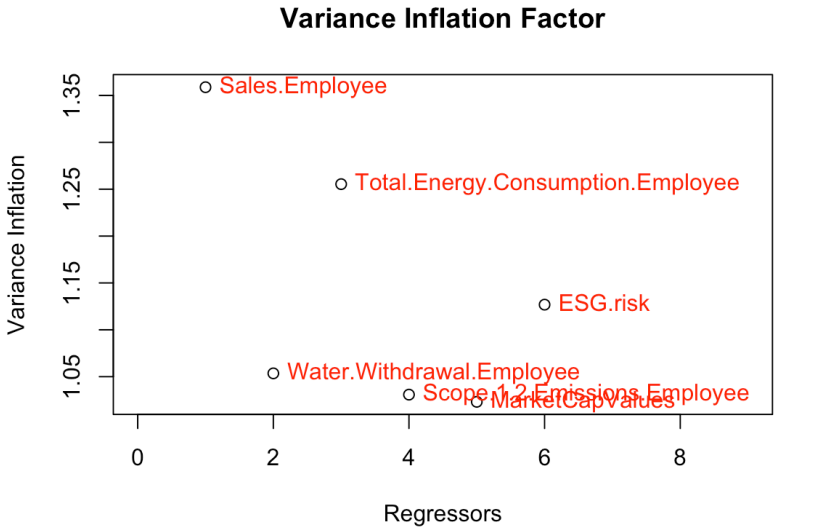

Figure 7: Variance Inflation Factors.

The VIF of each regressor variable is far beneath the relative limit of 10, giving the model no issues concerning multicollinearity.

6.1.2 Initial Model: Review and treatment

The initial model showed little to no potential in its predictionary capabilities with a negative adjusted R^2. However, the model did not fully comply with the assumptions, and improvements may lead to better predictive capabilities.

As per the residuals being normally distributed, the analysing of the QQ-plot was interpreted as not being sufficiently normally distributed. Hence, the model could benefit from a transformation of the dependent variable. A suitable transformation would be the *Log-transform* since the tails are left-skewed, where the response variable **Growth** would be transformed as $y = log(y)$. This will hopefully yield a more satisfactory result. However, since the response variable could be negative, i.e a company has lost value over time, a transformation is not possible without modification. Hence, a value will be added as $log(y + a)$ to move the base value, and produce positive values. Since the response variable is measured in percent, in this study used as decimal numerals, the value added will be $a = 1$, which is sufficient for this case. Subsequently, the transformation will be performed, and theoretically it will also further improve the constant variance for the error terms.

Concerning the influential point with a Cook's Distance > 1, thorough investigation in the observation was performed. However, after careful consideration, the data collected cannot be determined to be erroneous or incorrectly gathered. The conclusion is drawn that the observation cannot be excluded since it may contain a large explanatory power in the model. Therefore, the observation, however influential it may be, is deemed to be necessary to the model.

In terms of the residual plots, the variable *Total Energy Consumption/Employee* is deemed to be superfluous for the model and will be excluded in the following model. In regards to mean equal to zero for the residuals, along with variance of a constant character, both are deemed to be sufficiently fulfilled by reviewing the residual plots. In aspect of all the assumptions, no sign of multicollinearity is to be noted.

6.1.3 Second model

After implementing the changes mentioned, the following model was constructed;

Variable	Statistic
log(Y+1)	log(Growth+1)
X1	Sales/Employee
X2	Water Withdrawal/Employee
X3	Scope 1 and 2 Emissions/Employee
X4	Market Capitalization
X5	ESG-risk

This model led to a slight improvement in significance, however, still not to a degree to which it could be considered anything but negligible. The multiple R^2 was equal to 0.108, and the adjusted R^2 was calulated to equal 0.02522. However, since improvements have been made to the significance, the models capabilities has improved and its characteristics should be further evaluated.

Continouing the analysis of the second model, it is noticeable that the QQ-plot have been improved.

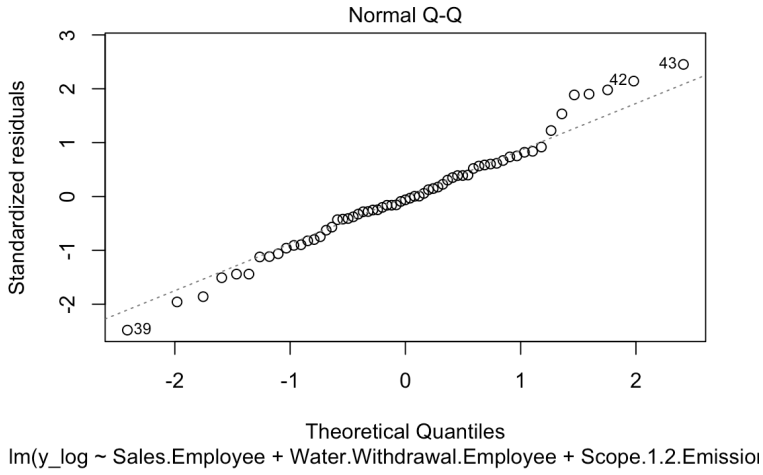

Figure 8: Q-Q plot

The tails are significantly closer to the line, providing a much more satisfactory distribution. Although it may not be excellent, the QQ-plot gathered from the second model is deemed sufficient, subsequently, the errors may be considered as normally distributed.

Review of the studentized- and PRESS-residuals is conducted aswell,

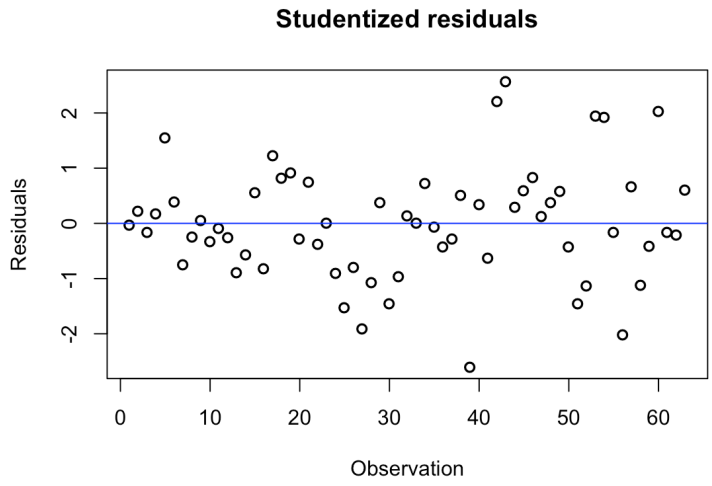

Figure 9: Studentized residuals

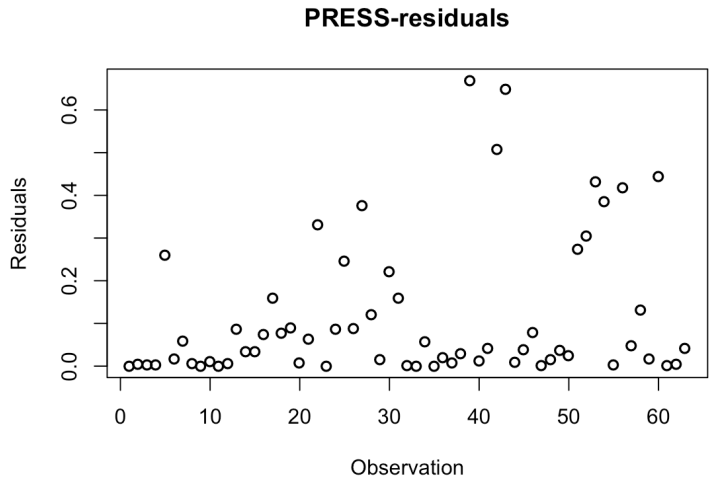

Figure 10: PRESS-Residuals

The Studentized residuals has not been altered to any significant degree. What may be noted however is that the distribution is more compressed, and should be considered slightly improved as the distribution implies a mean of the residuals even closer yet to zero.

Observing the PRESS-residuals however, it is noticeable that the values have all decreased to below 1, and the 23:d observation which showed high irregularity in the first model, has now diminished and the PRESS-residuals all show promising values. This may have also impacted Cook's Distance in a positive way.

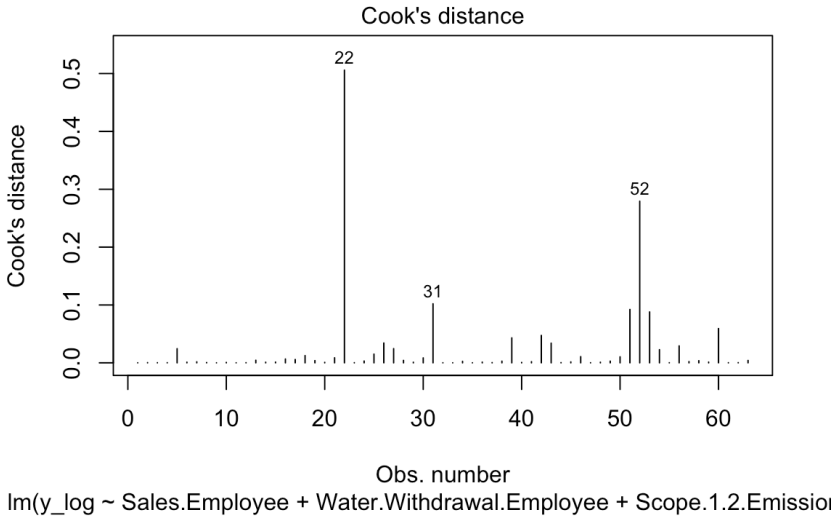

Figure 11: Cook's Distance

Incidentally, while not actively taking action on preventing the influential point from the first model to be excluded or treated, one of the other actions taken has subsequently also given advantageous results in the treatment of influential points. All observations are now comfortably within the limit of non-influential observations $D_I < 1$.

The *Added-Variable* plots resulting from the second model show no significant alteration from the previous model, as the slopes presented below all imply a linear relationship between the regressors and the dependent variable.

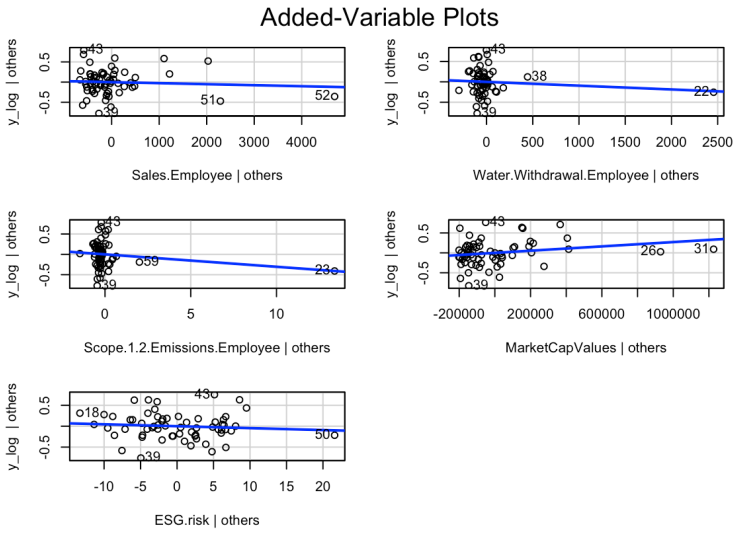

Figure 12: Added-Variable Plots

Reviewing the plot regarding the residuals variance in coherence with the fitted values, the

results are more satisfactory than in the first model even though the first models variance was deemed sufficient.

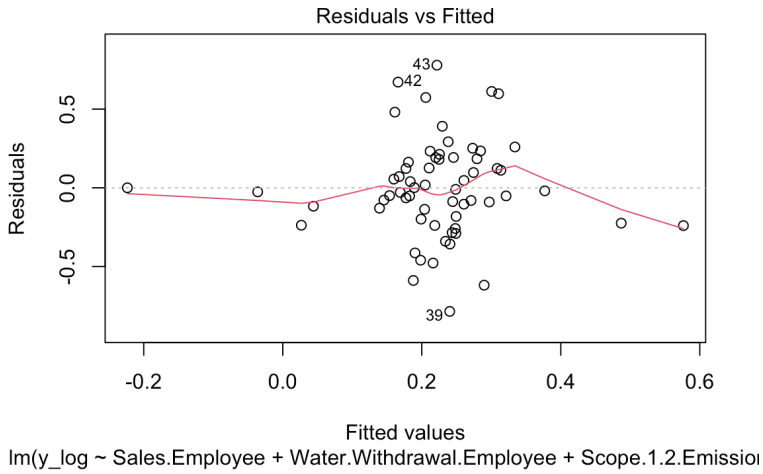

Figure 13: Residuals vs Fitted values

Lastly, an analytic procedure of multicollinearity within the model is conducted. Again, the models VIFs are examined.

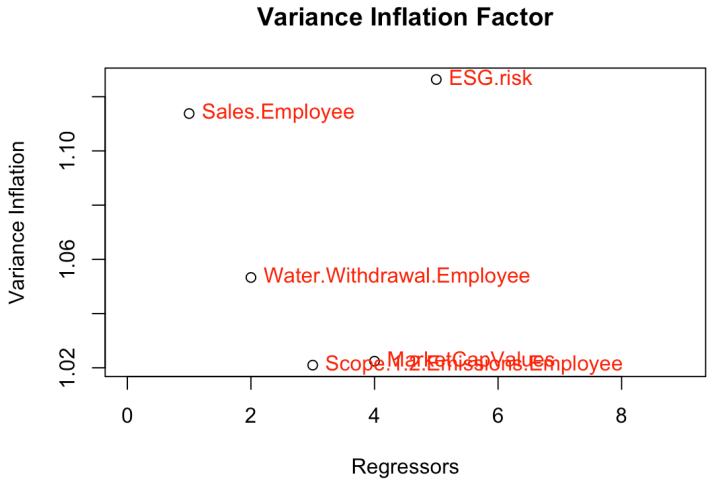

Figure 14: Variance Inflation Factors

The plotted values above are all in the circumference, yielding satisfactory results since VIFs over 10 are to be considered for further examination.

6.1.4 Second model: Review

The analytical review of the second model showed more satisfactory results with regards to the assumptions being fulfilled, i.e the assumptions were deemed to now be fulfilled. After reviewing analytically the plotted residuals, they showed satisfactory results in the error terms *mean, variance* and *linear relationship* between the regressors and the dependent variable. Viewing the QQ-plot, the errors showed what could be considered as a normal distribution and subsequently, the OLS assumptions are deemed to be fulfilled for the model.

With further investigation, it was noted that the removal of the variable *Total Energy Consumption/Employee*, not only improved the model because of superfluous data was not included. But the variable was also the source of the outliers, and so, with the removal of the variable, the model was not as heavily influenced by outliers.

The only unsatisfactory result is that of the models significance, i.e explanatory power of growth connected to the provided variables. However, the result might not be surprising, as will be discussed in the next section. However, the model, considering the data and variables used for the study, is deemed to be in its optimal form.

The variables for the final model are as follows.

Variable	Estimate	p-value
Sales/employee	$-2,55 * (-10)^5$	0.61
Water withdrawal/employee	$-9,35 * (-10)^5$	0.45
Scope 1 and 2 Emission/employee	$-3,55 * (-10)^2$	0.19
MarketCap	$2,71 * (-10)^7$	0.1
ESG-risk	$-4,61 * (-10)^3$	0.49

As one can see, the variables show little to no significance. This may depend on the models limitations, i.e the lack of variables included in the model or the lack of data. However, it may also indicate that there is no significant explanatory relation between a companies growth in share price and reporting on sustainability issues as of today. Considering the lack of data available, the fact that there are currently no regulations concerning sustainability reporting and the low amount of variables, the results should not be considered to be surprising. Furthermore, the art of determining growth depends on several more variables, and to determine growth by solely sustainability factors is highly unlikely. Further discussions on the results will be presented in section 7.

6.2 Results from the interviews on the EU Taxonomy

6.2.1 European Commission Sweden

Magnus Astberg, senior economic advisor at the European Commission, opens the conversation with describing the ambitious EU climate goals to reach climate neutrality by 2050. As the EU finds sustainable finance a very powerful tool to convert towards sustainability, an action plan was brought forward in 2018. Included in this action plan is the EU taxonomy, but also several other parts such as a standard for green bonds, and creating green indexes. The action plan works as a tool to translate the conversion towards sustainability to the financial markets. This action plan is produced by DG FISMA which is the part of the European Commission that are responsible for issues regarding the financial markets. Hence, it is designed from a financial market point of view, and not by those departments of the commission that work closely with green matters. However, all actions towards climate neutrality from the different departments in the EU, complete each other.

The EU taxonomy provides both a standard and a structure for sustainable funds as well as a common language on the financial market. For financial market actors, the taxonomy creates a possibility to create taxonomy aligned funds and indexes. Without the taxonomy, every financial market actor must by themselves define sustainability, which makes it difficult to compare financial products. However, the taxonomy is not formed as a legislation where one must invest taxonomy-aligned or with any restrictions on how to invest. The idea is to create a European standard for sustainable investments but it is optional whether investors will choose to invest in businesses that report good numbers according to the taxonomy. The expectations of the taxonomy is that it will help investors with guidance on what is reliable and comparable. Thus, the reporting requirements to label a financial product as taxonomy aligned will ensure and verify the reliability.

The taxonomy is both meant to help investors navigate towards sustainable companies as well as an indirect incentive for companies to create sustainable products. The expectation is that the taxonomy will make it more costly to finance unsustainability than taxonomy aligned economic activities.

Magnus, who has a background from the financial market side, strongly believes that the taxonomy will become a useful tool for financial markets. However, the taxonomy will not be viewed as an alternative to other standards and regulations, such as emissions trading, which also is of great importance for the conversion towards climate neutrality. The

combination of all is believed to be most effective. Nevertheless, there are large amounts of capital in the financial markets that can make a significant impact.

The taxonomy may prevent concepts such as green washing as the EU, as a credible part, sets up common standards for sustainability. Many financial market actors currently have their own sort of taxonomy that is very different from the EU taxonomy, and in many times green washing occurs in such. With the taxonomy, such banks might not be seen as credible. However, financial market actors are free to classify their financial products as "sustainable within our standards" but then customers cannot compare them with competitors.

At the moment, there are discussions on the delegated act within the European Commission. It is of great importance that the taxonomy is formed correctly, otherwise it will not be credible and not used. Nevertheless, Magnus states that it is strongly believed that the taxonomy has the prerequisites to succeed and become a influential part of the EU regulations towards climate neutrality. Regardless, the first part of the taxonomy will be taken to effect on the 1st of January in 2022.

Further, Magnus describes the next step of the taxonomy action plan, which in addition to green sustainability will include social sustainability. Yet, the formation of the including of social factors has not begun, but it will probably include social criteria such as child labor, working conditions and other product manufacturing aspects, forming a social index.

When asked about if the taxonomy is supported by research, Magnus describes two parts. In the first stages of the formation of the taxonomy, a technical group was selected with several experts on the area. The technical group was part of the formation of the first taxonomy draft and was then replaced by a permanent advisory group with different interests and areas of expertise. Secondly, the taxonomy is founded from both existing legislation within the union but also national legislation among the union members. Such legislation are also founded on scientific grounds.

Magnus cannot assess if new types of companies can be classified as sustainable within the taxonomy, since the taxonomy does not evaluate companies but their economic activities on a detailed level. Any companies can be taxonomy aligned if their economic activities follow the directives to contribute positively to at least one of the six environmental objectives, but do no significant harm to the others. As an example, hydro power is a sustainable energy source but if building hydro power plants implies issues for the fishes in the river, it may be in conflict with the other criteria. If the issue is solved, with for

example a fish ladder or fish-friendly turbines, the taxonomy criteria will be fulfilled. However, arguers may think that hydro power is sustainable either way but naturally, for the taxonomy to make an impact, it cannot come from a perspective that "it is good as it already is". The taxonomy must provide incentives to convert towards sustainability in every perspective.

From Magnus's understanding, the structure of the taxonomy provides potential to be dynamic and develop over time. When developing current legislation, the taxonomy requirements on sustainability will most likely also be adopted. After all, the taxonomy is far from completed. As previously mentioned, social sustainability is part of the taxonomy action plan.

Magnus finds the taxonomy a "hot" and important subject. He points out that at the moment, when the last details are to be formed, the taxonomy has been much criticized by different stakeholders. However in 2018 and 2019, when representatives from the European Commission such as Magnus himself, held seminars on the taxonomy during the political events in Almedalen in Sweden, the interest on the taxonomy was high and positively debated. At the time, it was mostly viewed from the financial market point of view. Now, the criticism comes mostly from affected companies.

6.2.2 Institute for International Economic Studies (IIES) - Stockholm University

John Hassler, Professor of Economics at IIES Stockholm University, does not believe that the EU taxonomy is relevant to impact climate change. Green investments do not work as a main tool to impact climate change, instead the key tool to reach global climate neutrality is through pricing emissions through either carbon taxes or emission trading systems, such as the EU ETS. Currently, some sectors are excluded from the EU ETS, and by including them, the EU will control all the emissions in the union and therefore John does not see the purpose of the taxonomy.

John also states that the taxonomy originates from an incorrect view on the climate issues, since it at the moment is not possible to completely stop using fossil fuels, but needs to be gradually phased out over the next few decades. There is much research proving that the most effective way to phase out fossil fuels is to put a price on emissions. Hence, if there is no price to emit carbon and other emissions, it will be profitable to emit. Therefore it is essential to reduce the profits on emissions.

John refers to an article in Dagens Nyheter (2021) where he and three other researchers

debate the relevancy of the taxonomy. Research shows that carbon taxes and emissions trading are effective ways to price emissions, with acceptable climate results and at lowest possible costs. The already modest price on emissions within the EU ETS makes coal power unprofitable. They also refer to investigations by the International Monetary Fund (IMF) that show that pricing emissions is effective and essential. Carbon fees are effective because they make emissions costly and therefore reduces the profitability of unsustainable operations. (Becker, Hassler, Nycander, & Strömberg, 2021)

Furthermore, John Hassler does not find the EU taxonomy relevant due to the large difficulties of classifying what is sustainable or not. The EU taxonomy becomes more of a political discussion with focus on horse trading, rather than on sustainability issues. "A common language for sustainability is needed, but the taxonomy is more of a new language, not a useful one." John does not think that it is viable to determine what is a "sustainable activity", which makes the concept green washing subjective for both those who invest as well as the companies that classify themselves as sustainable. Many sustainable companies, who do not classify as sustainable in the taxonomy, will continue to believe that they are sustainable and green washing will continue.

On the question of potential possibilities with the taxonomy, John answers that the basic idea with the taxonomy, to lead people towards sustainability thinking, is good. However, he does not find any lack of willingness in investing capital in sustainable companies. The taxonomy will not solve such problems, the solution is talented investors that can contribute to a company's profits and conversion towards sustainability. John also finds risks in letting people believe that they are contributing great good for the climate when investing green.

Another risk with the taxonomy regards the pensions funds. Once again, he refers to the article in Dagens Nyheter (2021). The article argues that the government of Sweden has pushed the public pension funds to both increase the holdings of green shares and bonds and to retreat all fossil fuel organisations. This risks reduced future pensions but cannot be expected to create a significant impact on the climate. Instead, public funds should use their large holdings in listed companies to impact the conversion. Selling holdings in fossil fuel companies does not imply that they disappear from the market, but that the influence shareholders have are left to other, probably less responsible owners. (Becker, Hassler, Nycander, & Strömberg, 2021)

Furthermore, the article argues that green funds do not imply higher expected returns. It may seem obvious that long term sustainability implies better returns, but decades of

research suggest that one should be sceptic. Historically, long term increased returns have not been possible by the use of publicly known information, without increasing the risk. (Becker, Hassler, Nycander, & Strömberg, 2021)

Lack of capital is not the main issue in the European Union. The global conversion requires investments that cost, especially in China, India and other developing countries. The EU should focus on developing technologies and making it available to less developed countries. (Becker, Hassler, Nycander, & Strömberg, 2021)

To conclude the interview, John does not believe that the EU taxonomy is a relevant tool to tackle climate change. Indeed, the conversion towards climate neutrality requires a great deal of investments but the most relevant course of action is to direct them towards issues regarding emissions.

6.2.3 KPMG Sweden

Torbjörn Westman, partner and head of assurance services at KPMG Sweden, works closely with the taxonomy. As accountants, KPMG advises clients from both sides of the taxonomy, both actors from the financial markets and companies that will report according to the taxonomy. However, they do not advise on how to invest.

Torbjörn explains that regarding investments, they see a significant change towards green capital such as green bonds and funds, with the current definition of greenness. Investors also look to procure sustainability portfolios. In that way, the taxonomy will carry out guidelines on sustainability and what is green. However, the EU's ambition is not to determine that everything outside of the taxonomy is not green, which is a common misunderstanding reported in the media. The EU has identified where most climate impact is found and from there they set criteria on how to perform green. Yet, it is not said that only "taxonomy companies" are green. However, the taxonomy enables change.

For financial market actors, a difference will be that they are obligated by law to report how much of their investments are taxonomy aligned. Nevertheless, the taxonomy only concerns the European financial markets and not globally. Actors on the financial market outside of the EU will not report on the taxonomy, and they may have other requirements. In a global perspective, only the European actors will be affected, but Torbjörn believes that it will be further spread and part of a larger context. The European Green Deal connects the taxonomy with other parts, such as green bonds and the disclosure regulation. In Sweden, the annual report regulation will be updated and

connected to the taxonomy.

For corporations, the taxonomy will lead to a more complicated reporting. Torbjörn also believes that it will be a topic for business decisions. Questions will be raised if the company scores a low percentage that is taxonomy aligned, what it depends on and if a transition is required. Torbjörn believes that the taxonomy will have some sort of effect, but the corporations have to overlook their investors and start a dialogue with them. Yet, it is essential for corporations to think forward. Currently, we are dependent on fossil fuels, but in ten years it will probably be too expensive or to put it bluntly, forbidden. However, Torbjörn does not believe that the taxonomy single-handedly will transform industries. The taxonomy will have an impact since the EU will legislate around it, but the combination of all regulations will be the key factor to create transformation.

As Torbjörn sees both possibilities with the taxonomy, he also identifies large risks with the taxonomy. To begin with, the taxonomy itself is quite complicated. There are lots of assessments that need to be done, and it will take some time before companies assess likewise. Furthermore, the taxonomy is not comprehensive and a great deal of economic activities will be left outside of it, and it is not clear what happens with them.

Naturally, Torbjörn discusses, there is also a risk that corporations become creative in their reporting. Not in an illegal way of course, but the taxonomy creates incentives to report as green as possible. Whether that is green washing or not is hard to tell, but with the taxonomy there comes a risk.

Torbjörn does not believe that new types of companies will be classified as sustainable in the taxonomy, since it is directed towards larger listed companies, where the majority has already reported their activities according to other frameworks. In the taxonomy, it is not the companies themselves that are classified as sustainable or not, but their economic activities. Therefore, the line will be sharper when only some economic activities are included.

When asked about the relevancy of the taxonomy, Torbjörn answers that it is clear that sharper lines on what is sustainable is needed. At the moment, it is a free market on claiming sustainability, which of course is a challenge where the taxonomy has a purpose. However, the taxonomy is terribly complicated, the draft included 600 pages of complicated data points and it does not even cover all economic activities. Some sort of framework on sustainability is needed for sure, but it is hard to determine whether the taxonomy is the right approach. Another challenge is that the taxonomy is limited to the European financial markets, but the corporations work on a global market.

Nevertheless, there are global driving forces to a joint global framework for sustainability and the EU are ambitious to find solutions and the taxonomy is an attempt. If it will work only the future will tell. However, we must not forget that right now there is no patented solution to the matter and the solutions will probably be a combination of many activities. A reporting system such as the taxonomy will not create change itself. In the end, it is the consumers and investors that will make the change happen.

6.2.4 Handelsbanken Sweden

Kristian Bjursell, senior sustainability manager at Handelsbanken, explains that Handelsbanken has a positive attitude towards the EU taxonomy. The taxonomy produces a framework and a definition that will prove helpful for them and their customers. The taxonomy also provides opportunities for Handelsbanken to offer financial services with high taxonomy share, which is something that they believe will be requested by their customers. They also find it positive that the taxonomy will contribute to increased transparency and comparability.

Furthermore, Kristian discusses the risks with the taxonomy and raises the issue if industries, that are not in the focus area of the taxonomy, are forgotten. Also there are risks that the taxonomy remains static and not under constant development during the years until the Paris agreement is reached.

On the question how the taxonomy affects Handelsbanken as an actor on the financial market, Kristian answers that Handelsbanken is a bank with significant activity within real estate financing and within asset management. Handelsbanken will regard all aspects of the taxonomy, but will be especially active within the mentioned two areas.

Furthermore, Kristian explains that Handelsbanken are convinced that companies with active sustainability work will gain a more beneficial development compared to their peers who choses to refrain. Some industries will naturally be compelled to put larger efforts on reestablishing their business, but that there may be the largest potential in the companies that work the hardest. For sure, companies with “impact” as a business idea will appear, and those will with great probability be able to attract external capital.

Regarding the relevance of the taxonomy, Kristian points out that we will know more about that once the final delegation from the European Commission is presented. There are many union members and not an easy task to adjust to all points of view. Yet, he remains hopeful that the outcome of the final delegation will be as good as possible. Kristian also points out that this is a journey of change we are about to do, and not only a

single step at this instant.

7 Discussion

In this study, extensive research has been performed to attempt to answer the research questions stated in section 1. In this section, a discussion of the results found is conducted, to analytically review the results in correlation to the questions. A discussion on the limitations realized during the study, as well as discussions on further studies will be conducted.

7.1 Analysis

As the world's first common language on sustainability, the EU taxonomy is certainly a hot topic in discussions. While the European Commission finds sustainable finance a powerful tool in the conversion towards sustainability, critics such as professor John Hassler from the IIES means that it does not work as a tool to impact climate change. Other critics do not agree with the details of the taxonomy, resulting in 46 000 responses when the taxonomy was open for public consultation. However, Magnus Astberg from the European Commission points out that most of the criticism towards the taxonomy has come after the details of it were presented to the public. Before, the taxonomy was positively debated and the interest for it was high from a financial market point of view. Now, the negative responses to the taxonomy mostly come from the affected companies.

However, looking at the financial markets, Kristian Bjursell and Handelsbanken have a positive attitude towards the taxonomy. They find the taxonomy helpful, providing opportunities to offer their customers new types of financial products and services, with increased transparency and comparability. They expect a demand from their customers on these types of products with high taxonomy share.

For those companies who have been viewing themselves as a sustainable company but will not classify as it according to the taxonomy, it may seem unfair, as the taxonomy reviews their economic activities from every perspective with the requirement to "contribute positively to at least one of the six environmental objects, but do no significant harm to any of the other". However, as Magnus Astberg explained, the taxonomy must provide incentives to be sustainable in every single perspective to really make an impact. What is viewed as sustainable today is not enough.

Magnus Astberg finds the taxonomy a potential solution to green washing, as it provides a common language on sustainability. All taxonomy aligned financial products will be reviewed and verified, hence there will be less room for green washing. However, Torbjörn Westman believes that there is a risk that corporations become creative in their reporting in a legal way, but whether that will be green washing he cannot tell.

Furthermore, Torbjörn Westman argues that it is essential for corporations to think forward. He points out that with the taxonomy, the EU has identified where most climate impact is found and from there set criteria on urgent sustainability issues. For example, the current dependency on fossil fuels will not be a possibility in the future and corporations need to find other solutions.

However, no one of the interviewees believe that the taxonomy single-handedly will lead to conversion towards climate neutrality. Magnus Astberg explains the European Commission's aim with the taxonomy and it is not meant as an alternative to other standards and regulations, such as emissions trading. Furthermore, as Torbjörn Westman states, "the taxonomy will have an impact since the EU will legislate around it, but the combination of all regulations will be the key factor to create transformation."

Nevertheless, professor John Hassler, does not believe that the taxonomy will have any positive impact on climate issues at all and points out the large difficulties with classifying sustainability. He finds the EU taxonomy more of a political discussion with focus on horse trading, rather than on sustainability issues. Instead he believes that the EU should focus on "the key tool to reach global climate neutrality" which according to him is through pricing emissions with either carbon taxes or emission trading systems.

John Hassler also states that green funds do not imply higher expected returns since historical data shows that long term increased returns have not been possible by the use of publicly known information, without increasing the risk. However, Kristian Bjursell and Handelsbanken are convinced that companies with active sustainability work will gain a more beneficial development. The largest potential is believed to be found in companies and industries that naturally will be compelled to put large efforts into reestablishing their businesses. A positive correlation between sustainability- and corporate financial performance was also suggested in several studies described in the sustainability theory. Further, Magnus Astberg believes that the large amounts of capital in the financial market can make a significant impact if invested in sustainability.

As Torbjörn Westman argues, there is a global demand on a functional framework on

sustainability. The EU is ambitious to reach climate neutrality and the taxonomy is their first attempt on such a framework. At the time, we do not have any patented solution to the climate issue. Probably, there is no single-handed solution but a combination of many actions. Further, Kristian Bjursell argues that the conversion towards climate neutrality is a whole journey and not a single action right now.

If formed correctly, the EU taxonomy has great potential to be of great use when investing sustainable. It also provides great potential to the development of sustainable products, as it becomes an additional incentive for corporations to work sustainable in all perspectives. Hopefully, the taxonomy will be a dynamic framework developing over time. In that way, it has potential to stay accurate also in the future. However, no one can anticipate for sure what outcome the taxonomy will have, only the future will tell. Therefore the relevancy of the taxonomy, depends on how well it succeeds as of now. Nevertheless, the taxonomy is an ambitious attempt to fill in the void for a sustainable framework, and in that way the taxonomy shows great potential in being a influential part of the future of business.

Furthermore, the OLS model produced in the mathematical part of the study resulted in a adjusted R^2 of only 0.025. Implying that the model used could be considered negligible in its attempt to determine growth. However, this result is to be expected, since trying to evaluate a company's growth is dependent on such a wide variety of factors, not only what is called tangibles such as assets, revenue or earnings before interests and taxes (EBIT). Growth also depends on ”intangibles” where circumstances such as an acknowledged board, goodwill and intellectual property are considered when valuing a company. To further the fact, speculation is also to be considered influential. Speculation about unproven potential may lead to a company's value rising more than it is factually proven to be valued at. These circumstances were always going to be a factor, however, the problem stated was that of the significance of evaluating growth in regards to sustainability, and in that case, the model is deemed ill equipped for the task.

In the final model, all regressors showed atleast a linear relationship with the dependent variable. This indicates that given the proper circumstances, the regressors from the final model may in fact consist of an explanatory power in determining a company's growth. However, one must bear in mind that the significance of the test gives that the linear relationships could also be considered untrue, leading to no clear evidence that they hold any significant explanatory property. But with an increasing significance for businesses in reporting according to the taxonomy, as stated in the interviews with Torbjörn Westman, and Kristian Bjursell , the future determined factors of the taxonomy may in fact come

to be important in determining a company's growth potential. After the taxonomy is implemented and data on company's reports and percentage ratings are more accessible, a multiple linear regression model could be considered for future analysis. However, the results of the study implies that a model with solely sustainability factors will not have a significant explanatory power.

In the model, the variables that showed the most potential, however not nearly enough to be considered viable in this model, were *Scope 1 and 2 Emissions/Employee* and *Market Capitalization*. Market cap is prominently used in evaluation methods, however, what is known as the *Size-effect* implies that smaller companies have a tendency to have larger growth possibilities. In the model however, *Market Capitalization* showed indications of larger potential growth, the larger the company. This contradictory result may be because of model limitations or lack of significance. The result may also indicate that in relation to the variables used, a larger size may relate to smaller amounts of climate impact per employee as a hypothetical answer, of course bearing in mind that the significance of the model implies that no absolute conclusions can be drawn. The emission factor yielded the closest explanatory power in this result, may indicate that in a more suitable model, reports on scope 1 and 2 emissions are to be considered. Of course, while bearing in mind the significance of the test and the fact that no absolute conclusions can be drawn. Seeing as $\beta_{Emissions}$ was negative, it implies that a larger amount of emissions per employee would yield a smaller growth, implying that it would be preferable for a company to reduce its emissions. The reporting according to the taxonomy, may further aid in the clarification regarding companies actual environmental impact, and thus could motivate investors to invest in companies that report a smaller amount of Scope 1 and 2 Emissions.

In regards to the mathematical model and the Multiple Linear Regression approach, no indication on that it would be suitable to determine growth using the variables selected for this model could be found. However, with the implementation of more regulated reporting in the future, it can not be excluded as a future part in larger models of evaluating potential growth.

7.2 Limitations

The fact that the taxonomy is still under development, and no concrete results as to whether it is a positive addition, or if its effect was not the desired one has given this study a more investigative and speculative approach. Seeing as there are no patented answers,

as stated by Torbjörn Westman, it is not possible to draw an absolute conclusion to the research.

The limited previous reporting on sustainable activities had a large impact on the development of the mathematical model. A larger datasample along with several more initial variables related to the taxonomy would have been preferable. However, since the taxonomy is still under development and data on sustainable activities is not available, the results might not be entirely representative of the actual situation.

The aspect of time is also one that could be considered problematic in this case, seeing as to the data gathered only concerned reports on 2019, and the growth examined was that over two years, important connections could be lost. Connections such as the change in growth from before reporting on sustainability issues, as to after beginning to report on the issues are therefore not available to be regarded.

7.3 Future Studies

In the case of future studies regarding the taxonomy, the surface has barely been scratched. Subsequently, studies performed after the implementation of the taxonomy may be of greater interest.

In regards of the mathematical model, a multiple linear regression tool with variables containing a wider selection of factors such as EBIT, revenue and factors regarding the reports on the taxonomy, along with a more comprehensive datasample and an increased amount of covariates may yield more satisfactory results. Further investigation as to what specific variables is most influential is also a subject for discussion. The possibilities surrounding sustainable investments are endless.

Leaving the linear regression approach, one might consider other analytical tools to determine the optimal factors regarding predicting growth. These may be included in more technical analysis of the share price.

8 Conclusion

The research questions stated in the introduction was about whether it could viable to determine growth in a company's value using sustainability factors, if that is the case, is the intended positive impact on sustainable investments viable, and concerning the relevance of the taxonomy regarding sustainable investments as well as the climate issue.

In terms of the viability of a multiple linear regression model consisting of sustainability factors, the conclusion can be drawn that a model of the sort can not determine a company's growth in value with regards to sustainability factors. However, there were indicators of a linear relationship between the factors, implying that a multiple linear regression model has potential to be used in further studies, however not solely with sustainability factors.

The taxonomy's intended impact on motivating financial actors to invest sustainable could also not with certainty be determined, even though there were indications of a negative relation between potential growth and large negative environmental impact. That would imply that companies with a focus on reducing environmentally harmful activities may have a more positive potential growth, however, the results did not show a significance close to the one required to be reliable.

The EU taxonomy is a first attempt at a common language and a mutual classification system for sustainability. Whether the attempt will succeed is not possible to anticipate before the final version of it is implemented. Certainly, with the taxonomy comes risks but also great possibilities to make an impact on the climate through the financial markets. Within the criteria of the taxonomy, are areas to which the EU has identified most climate impact is found and as the taxonomy creates incentives for corporations to work on sustainability issues. If corporations manage to convert their businesses to be taxonomy aligned, hopefully great impact on climate change will be the outcome. However, the EU taxonomy should not be seen as a single-handed solution to climate change. It is part of the sustainable finance action plan, which is a completion to the combination of several essential actions towards climate neutrality.

Seen to sustainable investments, they will most likely have an impact on a sustainable future, but to what extent the future will tell us. However, sustainability is not an assurance of higher future return on investments.

The relevancy of the EU taxonomy cannot be fully determined until the taxonomy has been implemented. However, a classification system on sustainability is for sure of great

relevance. Hopefully the EU taxonomy will succeed and assist investors in their search for sustainable investments as well as corporations to act sustainable.

References

1. Asen, E. (2020). Carbon Taxes in Europe. *Tax foundation*.

   https://taxfoundation.org/carbon-taxes-in-europe-2020/ Online; accessed April 10, 2021

2. Becker, B. Hassler, J. Nycander, J. & Strömberg, P. (2021). Gröna investeringar riskerar pensioner till liten klimatnytta. *Dagens Nyheter* http://hassler-j.iies.su.se/debatt/Grona_invest.pdf Online; accessed March 30, 2021.

3. Corporate Finance Insitute. What is Market Capitalization. https://corporatefinanceinstitute.com/resources/knowledge/finance/what-is-market-capitalization/?fbclid=IwAR0mTd1h-f5B0yxSwIaMgdATbETZZ61nuNIKbKBvbTfMpmBRkPpPUg_tOQ0

   Online; accessed April 05, 2021

4. Cunha, F A F d S. Oliveira, E M. Orsato, R J. Klotzle, M C. Cyrino Oliveira, F., Caiado, R G G. (2020). Can sustainable investments outperform traditional benchmarks? Evidence from global stock markets. *Business Strategy and the Environment*, 29(2), 682-697.

5. Delmas, M A. Burbano, V C. (2011). The Drivers of Greenwashing. *California Management Review*, 54(1), 64-87

6. EU Technical Expert Group on Sustainable Finance. (2020) Taxonomy: Final report of the Technical Expert Group on Sustainable Finance.

   https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/200309-sustainable-finance-teg-final-report-taxonomy_en.pdf

7. EU Technical Expert Group on Sustainable Finance. Spotlight on taxonomy.

   https://ec.europa.eu/info/sites/info/files/business_economy_euro/banking_and_finance/documents/sustainable-finance-taxonomy-spotlight_en.pdf

8. European Commission. (2018). Renewed sustainable finance strategy and implementation of the action plan on financing sustainable growth.

   https://ec.europa.eu/info/publications/

sustainable-finance-renewed-strategy_en Online; accessed April 7, 2021

9. European Commission. A European Green Deal.

   https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en Online; accessed April 7, 2021

10. European Commission. EU Emissions Trading System (EU ETS).

    https://ec.europa.eu/clima/policies/ets_en Online; accessed April 8, 2021

11. European Commission. EU taxonomy for sustainable activities.

    https://ec.europa.eu/info/business-economy-euro/banking-and-finance/sustainable-finance/eu-taxonomy-sustainable-activities_en Online; accessed April 7, 2021

12. Finansdepartementet. 2020. Grön taxonomi ska göra det enklare att identifiera och jämföra miljömässigt hållbara investeringar.

    https://www.regeringen.se/regeringens-politik/finansmarknad/taxonomi-ska-gora-det-enklare-att-identifiera-och-jamfora-miljomassigt-hallbara-inve Online; accessed April 7, 2021

13. Friede, G. Busch, T. Bassen, A. (2015) ESG and financial performance: Aggregated evidence from more than 2000 empirical studies. *Journal of Sustainable Finance Investment*, 5(4), 210-233.

14. Global Sustainable Investment Alliance. (2018). 2018 Global Sustainable Investment Review. http://www.gsi-alliance.org/wp-content/uploads/2019/06/GSIR_Review2018F.pdf

15. Kungliga IngenjörsVetenskaps Akademien, 2021. Hindrar EUs taxonomi hållbara svenska investeringar?

    https://www.iva.se/event/hindrar-eus-taxonomi-hallbara-svenska-investeringar/

    Online; accessed March 25, 2021

16. Montgomery, D. Peck, E. Vining, G. (2012). Wiley Series in Probability and Statistics. *Introduction to Linear Regression Analysis*.

17. Nordea. Vad är ESG?

    https://www.nordea.com/sv/hallbarhet/hallbar-verksamhet/vad-ar-ESG/

Online; accessed April 05, 2021

18. RBC Global Asset Management. (2019). Does socially responsible investing hurt investment returns? https://www.rbcgam.com/documents/en/articles/does-socially-responsible-investing-hurt-investment-returns.pdf

19. Schaltegger, S. Wagnerm M. (2006). Integrative management of sustainability performance, measurement and reporting. *International Journal of Accounting, Auditing and Performance Evaluation*, 3(1), 1-19.

20. Sustainalytics. Sustainalytics' ESG Risk Ratings offer clear insights into the ESG risks of companies.

    https://www.sustainalytics.com/esg-ratings/

    Online; accessed April 05, 2021

21. Swedish House of Finance. Assessing Sustainability in Nordic Companies. https://www.hhs.se/en/houseoffinance/research/featured-topics/2017/assessing-sustainability-in-nordic-companies/

    Online; accessed April 12, 2021

22. Talan, G. Sharma, G. (2019) Doing Well by Doing Good: A Systematic Review and Research Agenda for Sustainable Investment. *Sustainability (Basel, Switzerland)*, 11(2), 353.

23. Vörösmarty, C J. Osuna, V R. Koehler, D A. Klop, P. Spengler, J D. Buonocore, J J. Cak, A D. Tessler, Z D. Corsi, F. Green, P A. Sánchez, R. (2018). Scientifically assess impacts of sustainable investments. *Science (American Association for the Advancement of Science)*, 359(6375), 523-525.

24. Worldfavor. 5 Sustainability Reporting Frameworks to Help Your Organiaztion Set Priorities.

    https://blog.worldfavor.com/5-sustainability-reporting-frameworks-to-help-your-organization-set-priorities

    Online; accessed April 05, 2021

Appendices

A First Appendix

A.1 Interview questions

A.1.1 General questions

1. What is your attitude towards the taxonomy?
2. Do you find any possibilities with the taxonomy?
3. Do you find any risks with the taxonomy?
4. Can you predict any new types of corporations being classified as sustainable with the taxonomy?
5. How relevant is the EU taxonomy?

A.1.2 Questions to the financial market actors or taxonomy advisors

1. How does the taxonomy effect you or your clients?
2. Where will your or your clients focus lay?
3. Has a framework on sustainability in financial products been missing on the financial market?

A.1.3 Questions to the European Commission

1. What change do you hope to see with the taxonomy?
2. How much research supports the taxonomy?

B Second Appendix

B.1 Interview information

Date	Name	Company or Institution
March 30, 2021	Magnus Astberg	the European Commission
March 30, 2021	John Hassler	Stockholm University - IIES
April 12, 2021	Torbjörn Westman	KPMG Sweden
April 16, 2021	Kristian Bjursell	Handelsbanken

TRITA – SCI-GRU-2021:314