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"The Impact of Inflated ESG Ratings on Socially
Responsible Investment:
An Analysis of Adverse Selection"

by

Erik Carlström

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GRA 19702 - Master Thesis

ABSTRACT

We find that sustainable investors can be deceived to preform unsustainable investments when relying solely on ESG ratings. This is because companies can artificially inflate their ESG rating by promising future sustainable performance and not implement what they promise. We find that Refinitiv ESG rating are negatively correlated with our realized ESG rank, hurting the incentive of sustainable investors. We also find evidence that companies may be motivated to inflate their ESG ratings for capital cost reductions, creating a moral hazard. Using our ESG ranks to construct a portfolio does not create abnormal returns compared to Refinitiv's rating, but results in better overall realized performance.

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1 Introduction

Traditionally, investors have been drawn toward businesses that yield the highest risk-adjusted return on investment. However, recent years have seen a growing trend where investors incorporate their personal values into their investment decisions (Fritz & Von Schnurbein, 2019). Social responsibility investing (SRI) is an investment strategy where investors attempt to align their values and financial interests by minimizing their environmental footprint and improving social conditions. As of the beginning of 2020, assets under management within the SRI segment reached USD35.3 trillion, accounting for a third of all professionally managed assets (GSIA, 2020). Despite its increased popularity, researchers continue to debate the relationship between a company's environmental, social, and governance (ESG) performance and its financial performance, as well as how ESG performance can be measured and applied as a financial metric. Navigating in this new environment has proven difficult and ESG ratings have become an increasingly important tool for investors that want to act socially responsible.

ESG ratings are provided by a variety of organizations, each with its own methodology, criteria, and scoring systems. A survey conducted by Sustainability found that 65% of investors use ESG rating at least once a week (Wong & Petroy, 2020). In 2022, 43% of investors stated that they were required by their employers to incorporate ESG ratings in their investment strategy, a significant increase from just 12% in 2019. Even though most investors use ESG ratings in some shape or form, there is still a severe lack of trust in their ability to accurately predict sustainable performance. One third of corporates reported having low to very low trust in ESG ratings' ability to accurately reflect ESG performance (Brock et al., 2023). Furthermore, researchers are divided on the relationship between ESG ratings, scores, and financial performance. Due to conflicting research, data, methodologies, and practices, the ratings diverge among providers, causing an adverse selection problem for the investor. Such information asymmetries make it difficult for investors to accurately assess companies' ESG performance and make informed sustainable investment decisions.

The way companies communicate their sustainable performance to the public is usually via a sustainability report. These reports can contain information on the companies' emissions, resource usage, stakeholder engagement, policies, targets,

and much more. Since a lot of the ESG standards integrated into a sustainability report are still currently voluntary and self-reported, there could be an incentive for companies to only report the figures that advance their case as an investment, and to avoid reporting the figures that will hurt their rating. Barber et al. (2021) find that investors can be willing to knowingly forego some expected financial returns for social or moral considerations. This means that companies can raise capital at a lower cost, as investors do not demand as high expected return as with another company with the same risk profile but an inferior sustainable performance. According to Pástor et al. (2021), companies can effectively lower their capital costs by catering to the preferences of socially responsible investors and enhancing the overall sustainable performance of the economy. The problem arises when investors are unable to distinguish between sustainable and unsustainable businesses. If a company deliberately can mislead rating agencies through promises of future sustainability in their reports, we end up in a situation where socially responsible investors run the risk of inadvertently favoring the wrong companies in their pursuit of socially responsible investments. The goal of this thesis is to investigate whether companies inflate their ESG rating through promises about future sustainable ESG performance without following through on their promises. We will create our own ranking based on firms promised and realized sustainable performance. By implementing these rankings in a sustainable investment strategy, we will try to solve the issues socially responsible investors face. Then we will discuss which measures should be taken by different actors to improve the current situation and facilitate better SRI decisions.

The research question is as follows:

"Are ESG ratings inflated, and if so, how does this impact the decision-making process of sustainable investors?"

The thesis consists of 6 parts. We begin with an introduction followed by a review of relevant literature within the field of ESG ratings and their effect on financial performance, with a focus on understanding the challenges of measuring and valuing ESG factors. We find that ESG has become a hot topic for academics in recent years as a result of the increased focus on climate and the environmental problem the world is facing. Research on the effectiveness of ESG as a financial metric is however conflicting, and we find no evidence that investors have confidence in ESG ratings as an accurate investment tool. We identify that the

literature on factors that drive ESG ratings are limited. Section 3 provides an overview of our data collection methods and data management. Further, we gather granular ESG data and company fundamentals from Refinitiv Eikon, institutional ownership data from Wharton Research Data Services, and the Fama-French factor from Kenneth French's data library. We apply various merging procedures before screening and cleaning our dataset. Section 4 goes through the research methodology used to test ESG ratings for inflation and their effect on investor decisions. Here we divide our granular ESG data variables into Promised ESG and realized ESG based on the ESG type. We proceed by applying Wittkowski et al. (2004) multicriteria ranking algorithm to create a promised and realized ESG ranking for each company. Then, we run multiple regressions on these ranks and Refinitiv's ESG to look for proof of inflation. Next, we investigate whether companies have incentives to inflate their ESG ranking to reduce capital costs and attract institutional investors. We then apply this knowledge to create portfolios to hopefully aid socially responsible investors to make good decisions. Section 5 presents our results and findings and discusses their application. We find that Refinitiv's ESG ranking is in fact inflated as the main driver of the ranking is promised ESG and not actual ESG performance. Additionally, we find that companies do not realize said promises in the future, and that they are incentivized to do so to lower their capital costs. We find that ESG ratings are positively correlated with the number of institutional investors. We did not find that any of our portfolios significantly outperformed the others, but by using our realized ESG ranking, you can invest in companies that outperformed the others in terms of sustainability. Lastly, part 6 concludes and highlights our results and their application as well as present the limitations of our research and come with suggestions for further research.

Our motivation is to facilitate socially responsible investing that we believe will be a vital part of the solution to the problems the world is facing in the *environment*, i.e., pollution and global warming, *social*, i.e., poverty and social differences, and *governance*, i.e., discrimination and equal rights.

We contribute to the literature by providing valuable insights in the field socially responsible investing and contributing to the ongoing discussion regarding the relationship between ESG performance and financial performance. Our thesis provides supporting evidence for inflated ESG ratings as well as bringing depth to

the understanding of ESG performance. Further we want to highlight the flaws of the current ESG landscape and stress the importance of standardized practices.

2 LITERATURE REVIEW

In this section, we review relevant literature in the fields of ESG and SRI that can support our research further. We examine prior research that can contribute to a better understanding of the SRI landscape, and how investors can navigate within it. First, the literature review discusses rating disparity and how ESG ratings differ across providers. We then look at the literature regarding our thesis' main topic of interest, which is inflated ESG ratings. Finally, we review the literature on ESG performance, including cost of capital, returns, and portfolio research.

A study published in 2022 by Capital Group shows that ESG adoption among global investors has risen to 89% in 2022, an increase from 63% in 2018. They explain the increase with growing client demand and external pressures. 42% of global investors cite client expectations and reputational concerns as factors driving their approach to ESG (Capital Group, 2022). A key question regarding ESG-related companies is how to analyze and differentiate them from other investment opportunities. An important source of information on a company's sustainability is the company's various external ESG ratings. Widyawati (2020) finds that socially responsible investors use ESG ratings to guide investment decisions, by giving preference to companies with high ratings and avoiding those with low ratings. Still, not all investors are happy with the state of the current ESG rating landscape. Fish et al. (2019) found that in 2018, over 600 ESG ratings were created, and Li & Polychronopoulos (2020) found evidence of 70 companies that offered different types of ESG ratings. Additionally, they state that this number does not take into account the numerous investment banks, government organizations, and research organizations that conduct ESG-related research and can create their own in-house ratings.

On top of the large amount of ESG ratings, the literature also shows tendencies of disparity which is well-documented by Chatterji et al. (2016), Dorfleitner et al. (2015) and Semenova & Hassel (2015). These studies show that rating organizations have varying methodologies for measuring ESG ratings and different

standards for what constitutes the relevance of variables. In some instances, the vast number of variables used makes it challenging to distinguish which are truly meaningful and which are not. Berg et al. (2021) discuss the reliance on ESG rating providers and the changes to the historical scores of data from Refinitiv (2021). In 2020 they underwent significant modifications in the ESG score calculation methodology and ongoing unannounced data modifications. These changes showed a significant impact on a firm's rankings. Since we collect our data after the methodology changes our sample is unaffected by these changes.

Bams & van der Kroft (2022) further provide a critical analysis of ESG ratings, identifying the potential for inflation of these ratings as a central concern. They propose that SRI practices can cause a bias toward companies with strong ESG ratings, irrespective of whether the firms' actual practices align with sustainable performance indicators. They argue that this phenomenon could potentially generate an inverse relationship between ESG ratings and actual sustainable performance. Furthermore, they highlight the discrepancy that firms with inflated ESG ratings may not consistently deliver the anticipated environmental and social advantages. This inconsistency underscores the need for thorough examination of ESG ratings' reliability and precision, as well as the potential for firms to leverage these ratings to project an exaggerated image of sustainability, often referred to as "greenwashing". The authors also draw attention to the instrumentalization of ESG ratings as a promotional strategy by firms, which can result in investors lacking a comprehensive understanding of the actual performance of their investment targets. They stress the importance of transparency and comprehensive disclosure in ESG investing, arguing that these elements are crucial for ensuring accountability in sustainability claims.

We are intrigued by the potential inflation of ESG ratings, and we also want to contribute to this by looking at the effect inflated ESG rating can have on several financial performance measures. Following prior research, we see that a firm can acquire better discount rates and is perceived as less risky by appearing more ESG focused. Goss & Roberts (2011) adds to this by showing that companies perceived to have social responsibility concerns tend to pay higher interest rates on their loans, resulting in a higher discount rate for these firms. In comparison, companies without said concerns are rewarded with lower capital costs. In the last part of our thesis, we want to see what implications ESG ratings have on portfolio performance.

Glossner, (2017) for example, constructed a portfolio of companies with a history of breaking ESG regulations. The research resulted in lower returns, which serves as evidence that corporations face increasing financial penalties and volatility for their socially irresponsible actions.

From our investigation, we find that the general tenancy in the literature suggests that ESG has no positive effects on a firm's operations, market price, or performance. This observation is notable, particularly in light of the apparent increase in investor's interest in opportunities that facilitate sustainable investment. However, researchers are conflicted in their views on how ESG implementation creates value. Hong & Kacperczyk (2009) found that sin stocks, i.e. investments associated with companies involved in morally or socially controversial industries such as tobacco, alcohol, gambling, or weapons manufacturing, performed better than other comparable companies. Similar studies show comparable outcomes, concluding that stocks with low ESG performance tend to outperform their counterparts (Bolton & Kacperczyk, 2021), (Pástor et al., 2022). Other studies by Kempf & Osthoff (2007), and Edmans (2011) have found that high ESG stocks tend to perform better.

One challenge that arises with research on ESG performance is determining causality; are firms with higher ESG scores rewarded with higher market pricing, or are firms with higher market pricing simply more profitable so they can afford to implement more ESG measures? Even when research shows a positive correlation between a company's ESG scores and its profitability, there is still a question about causality. The relationship may run in the opposite direction, with a company's financial success allowing it to invest more in socially responsible initiatives, and therefore earning a higher ESG recognition. Schreck (2011) attempted to account for this endogeneity issue, which refers to the question of whether high-performing firms are socially responsible or if socially responsible firms perform well. The study concluded that there was no correlation between profitability and social responsibility. Another study done by Cornell & Damodaran, (2020) explore the relationship between ESG factors and financial performance. They argue that while there is a growing conviction that companies that prioritize ESG considerations are likely to be more sustainable and financially successful in the long run, the extent to which ESG factors impact financial performance is a subject of debate. Further, they describe the challenges of

measuring and valuing ESG factors, as these can be more intangible and may require more subjective assessments compared to traditional financial metrics. Margolis et al. (2009) reviewed 251 studies that looked at the connection between ESG and operational profitability in 214 papers. They found only a weak positive association between them.

Our literature review provides mixed evidence for ESG performance. While some studies suggests that sustainable companies acquire better returns, others find that worse companies perform better. A common ground is found in the research of ratings disparity where the results indicates that there is a need for standardized practices for ESG reporting. We find the previous literature interesting because it starts discussion and need for additional knowledge on how a sustainable investor should strategically act when investing. Our goal is to close this informational gap and provide addition research to this ongoing topic.

3 DATA

In this section, we will describe the data collection and management for our thesis. First, we present the databases and their integration, then we proceed with a description of the data screening and cleaning process. Finally, we describe the different ESG categories and their content.

3.1 Databases and data merging

To distinguish between a company's promises of future sustainability and their actual realized sustainable performance we must collect detailed ESG data. All ESG information is collected from Refinitiv Eikon's ESG database. Eikon claims to provide the most extensive company fundamentals data available, covering 85% of global market capitalization across 180 countries, with direct access to the source filing for verification purposes. In terms of the scope of ESG information, Refinitiv Eikon provides the most comprehensive information available and has therefore seen extensive use in academic work. Their ESG information is manually collected and audited by ESG specialists and is based on publicly available sources. This consist of company websites, annual reports and corporate social responsibility (CSR) reports. The database contains over 700 different EGS variables with data

points going back to 2002 (Refinitiv, 2023a). Only using one provider of ESG ratings is a limitation, and we recognize that the study might be improved by implementing additional rating providers. However, the likelihood of these alternative providers' ratings not being inflated is low due to the prominence of Refinitiv ratings.

Additionally, we collect data on the company fundamentals like returns, weighted average cost of capital (WACC), cost of equity (COE), and cost of debt (COD) from the Eikon database. We also collect data on institutional holding from Wharton's research data service. This data is then merged with our EGS data by performing numerous ticker string-matching techniques in addition to manual matching. Lastly, we collect the annualized Fama-French factors from the Kenneth French Data Library (2023) to run a Fama-French 5-factor model with momentum. The factors we have included are based on developed countries to match the majority of our screening. Kenneth French's database consists of data from reliable sources and is highly regarded by others.

3.2 Screening and Cleaning

We utilize Eikon's Screener API to create our sample. In accordance with Fama & French (1992) our sample consists only of nonfinancial companies from 2013 to 2021. This is due to the incomparability of their high leverage to other sectors. The companies included operate in the following GICS sectors; 207 in energy, 394 in materials, 555 in industrials, 382 in consumer discretionary, 222 in consumer staples, 166 in health care, 726 in information technology, 142 in communication services, 157 in utilities and 190 in real estate. We proceed to screen for active companies in the primary market. We realize that the fact that we screen out companies that have discontinued their operations during our sample period creates a survivorship bias, but we, unfortunately, had lost the Eikon access when we discovered this mistake. We are left with a sample of 3,141 companies: 712 in Europe, 930 in North America, 1076 in Asia, 209 in Oceania, and 116 in South America.

Next, we further clean the dataset by removing variables that are unrelated or unusable due to a lack of data. Some variables, like "nuclear weapon", are too narrow in scope and others are nearly empty. We, therefore, remove all variables containing less than 200 observations to retain variable relevance. For some

variables like “onsite working accidents” we divide by total assets to include differences in scale. We also merge and remove several variables that measure the same ESG characteristics to avoid overlap. Before utilizing the variables in the ranking algorithm which favor high scores, we must align the “direction” of some variables. While a high score in “Employee training hours” is favorable, a high “Total emission/Total assets” score is unfavorable. To fix this we simply make all variables with a negative impact into negative numbers. Lastly, we must correct reporting bias that can occur when ESG reporting is unregulated. Since ESG policies, targets, and activities are self-reported there is an incentive to only include the positives in their CSR reports. Therefore, we interpret incomplete data on these ESG types as missing. A complete overview of our granular EGS data can be seen in Table 1 in the appendix.

3.3 ESG types

Like Bams & van der Kroft (2022) we separate the EGS data into different ESG types. As a proxy for promised ESG performance, we collect data on company policies, targets, and activities, while controversies and performance data are used for the realized ESG score. An overview of the ESG types can be seen in Table 2 below. *Reporting* reflects the quantity and quality of sustainability reporting by the firms, either as a CSR report or as a part of the annual report. In these reports, companies project improvements in future sustainable performance by adhering to ESG strategies and operations. This is complemented by goals that outline potential sustainable performance enhancements, and whether the report follows Global Reporting Initiatives (GRI) guidelines. *ESG activities* contain variables that portray the various practices and initiatives undertaken by the companies. However, due to uncertainties regarding firms' adherence to these guidelines, activities cannot be considered indicators of realized sustainable performance. Similarly, *ESG policies* should be viewed as promises of future sustainable performance as they are often superficial and inexpensive to implement but provide limited sustainable performance impact. They are often reported in a binary manner, similar to activities. For instance, a variable showing whether a firm has waste reduction initiatives aligns more closely with an ESG policy than their actual waste to total assets ratio. This applies equally to whether companies have health safety training and the size-adjusted injury rate, or whether they have environmental investment initiatives and the actual investment amount. Lastly, by definition, *ESG targets*

embody projected sustainable performance. Considering all of this, reporting, activity, policy, and target offer a complete view of promised sustainable performance.

The realized data consists of *ESG controversies* and *performance* variables. This information is often sourced from third-party platforms like media, NGO reports, and governments. *Controversies* include variables such as tax fraud, working accidents, and strikes. It involves evaluating the extent of negative incidents, legal violations, public scandals, or controversies that a company has been involved in, which may have adverse effects on its reputation, stakeholder trust, and long-term sustainability. *Performance* refers to the assessment and evaluation of a company's overall effectiveness and achievement in integrating ESG principles and practices into its operations, strategies, and outcomes. This variable encompasses the company's ability to demonstrate positive environmental impact, social responsibility, and ethical governance practices, as well as its ability to generate sustainable financial returns (Bams & van der Kroft, 2022).

This table show an overview of the different ESG types that goes into each ESG ranking

	Rank	
	Promised	Realized
ESG types	Activity Policy Reporting Target	Performance Controversies

Table 2: ESG types

4 METHODOLOGY

In this segment, we will go through the methodology we applied to conduct our research and present our hypotheses. The first thing we want to investigate is whether current ESG ratings are inflated by promising future sustainable performance. For the ESG rating to be recognized as inflated, the main driver of the rating must be promised ESG, and these promises are not followed up. We examine this by separating granular ESG data into promised and realized ESG. Next, we use this data to create a promised and a realized ESG rating and regress these ratings on Refinitiv Eikon's ESG rating. Subsequently, we want to investigate the incentives

a company might have to purposely inflate their rankings by looking at the effects of a higher ESG rating on their cost of capital as well as examining the effect inflated ESG ratings have on institutional holdings and portfolio allocation.

4.1 Promised and Realized ESG Ratings

As explained in the data section we separate the different variables in our data sample into two categories based on whether the variable reflects sustainable performance that will happen in the future (promised) or has happened (realized). When the data is filtered to their respective promised and realized ESG categories we apply a multicriteria rank-ordering algorithm by Wittkowski et al. (2004). The algorithm was created by Knut M. Wittkowski for use in medical studies and was first adapted by Bams & van der Kroft (2022) for ESG research purposes. The ranking is based on the principle of weak dominance, where a company is considered superior to another company within the same industry when it is at least strictly better in one aspect of ESG and equal or better in all others. Equation (1) allows us to evaluate and compare the ESG performance, denoted by x , of different firms (f) within each specific industry and year. This equation lets us assess the sustainability performance across all ESG aspects compared to the other for each aspect of ESG in the same industry. Next, we calculate the relative promised and realized ESG scores for each firm individually by subtracting the count of firms inferior to the firm from the count of firms superior to it, as per Equation (2). This will give each company a rank in each ESG aspect. Further, we normalize the promised and realized ESG scores to fit the Refinitiv ESG rating reported on a 0 (inferior) to 100 (superior) scale. We end up with one promised and one realized ESG score for each company that we can use for further research.

$$ESG_f > ESG_{f'} \Leftrightarrow (\forall_{x=1,2,\dots,X} ESG_{fx} \geq ESG_{f'x} \cap \exists_{x=1,2,\dots,X} ESG_{fx} > ESG_{f'x}) \quad (1)$$

$$Rank(ESG_f) = \sum_{f'} I(ESG_f > ESG_{f'}) - \sum_{f'} I(ESG_f < ESG_{f'}) \quad (2)$$

This non-parametric ranking approach has some key advantages over other traditional ESG rating systems. As noted by Ioannou & Serafeim (2019), sustainable performance may fluctuate significantly over time and often exhibits convergence within industries. Because of this, the algorithm is set to be industry- and year-specific, meaning that they only compare firms within the same industries

and years, such as the energy sector in 2013 and the healthcare sector in 2018. This separation also helps us further since we do not consider weights like regular rating agencies but determine which aspects of sustainable performance are most common within each industry's ESG data. For instance, when certain controversies are rare in a given sector, firms encountering these controversies will get a lower realized ESG score than firms with more frequent controversies within that industry. We will also observe the same when a company fails to report on common industry performance. Here non-compliant firms will face steeper penalties and attain a lower score. In the subsequent sections, we'll use these promised and realized ESG scores to construct a method for identifying potential inflation in ESG ratings. The ratings are also implemented on specific financial performance measures such as the cost of capital and portfolio alpha.

4.2 Checking for inflated ESG ratings

As previously stated, we have two criteria for an ESG rating to be recognized as inflated. If the rating 1) primarily captures a company's promised sustainable performance, and 2) does not deliver on these promises over time. We hypothesize that:

Hypothesis 1:

Promises of future sustainable performance have a larger impact on their Refinitiv rating than the realized sustainable performance. (3)

$$H_0: \beta_{promised} \leq \beta_{realized}$$

$$H_1: \beta_{promised} > \beta_{realized}$$

Hypothesis 2:

Promises of future sustainable performance are not realized in the future.(4)

$$H_0: \beta_{promised\ k-t+1} \geq 0$$

$$H_1: \beta_{promised\ k-t+1} < 0$$

To test whether the first hypothesis for rating inflation holds we introduce a panel data regression for our analysis. This efficiently utilizes cross-sectional (companies and sectors) and time series (years) data. This method provides additional control for unobserved, time-invariant factors, such as inherent characteristics of companies and global ESG standard shifts, which are typically overlooked in ordinary regression models. We also implement robust standard errors to account for heteroscedasticity or autocorrelation that might remain in our model.

Equation (3) shows the panel regression. It denotes the ESG rating of the company (i) in period (t), with $ESG_{i,t}^{Promised}$ and $ESG_{i,t}^{Realised}$ representing the promised and realized ESG scores, respectively. $\gamma_{i,t}$ is a set of control variables, like firm, industry, size, and country fixed effects, and $\epsilon_{i,t}$ is the error term. Firm fixed effect account for the unique characteristics of individual firms such as management practices and corporate culture. Industry fixed effects control for the characteristics specific to a particular industry, such as growth rates, leverage ratios and levels of competition. Country fixed effects controls account for country-specific factors like legal environment and economic conditions and might influence the results. Size control factor adjusts for the influence of firm size, balancing between the benefits of larger firms and the potential advantages of smaller ones. We have chosen these to replicate the methodology of Bams & van der Kroft (2022). This arrangement allows us to test directly whether ESG ratings reflect contemporary actual sustainable performance, i.e., whether β_2 is positive.

$$Rating_{i,t} = \alpha + \beta_1 * ESG_{i,t}^{Promised} + \beta_2 * ESG_{i,t}^{Realised} + \gamma_{i,t} + \epsilon_{i,t} \quad (3)$$

To test hypothesis 2, we evaluate whether sustainable performance promises are met in the future. In Equation 4, we perform a lagged regression analysis of companies' promised ESG scores going back 9 years on their current realized ESG scores. Since our sample is growing over our sample period, we estimate this model separately for each lag up to 9 years of future realizations. The regression analysis allows us to verify whether future sustainable performance improvement promises are realized in the future, further determining whether ESG ratings are inflated.

$$ESG_{i,t}^{Realised} = \alpha + \beta_{k-t+1} * ESG_{i,k}^{Promised} + \gamma_{i,t} + \epsilon_{i,t} ; \forall k \in \{t-9, t-8, \dots, t\} \quad (4)$$

4.3 Cost of Capital

If the evidence of ESG rating inflation holds, it can create information asymmetries for socially responsible investors. Previous literature from the review suggests that a good ESG score can impact a firm's cost of capital. In this section, we will investigate if a firm gain cost of capital advantages, that is lowering the discount rate, by promising future ESG initiatives.

To check if promises of better ESG initiatives cause a reduction in a firm's cost of capital we need to collect relevant data for our sample. Refinitiv uses the StarMine Weighted Average Cost of Capital (WACC). It provides an estimate of the average rate a company must pay to its stakeholders, i.e., debt holders, equity shareholders, and preferred stockholders, for the funding of its assets. This calculation is made with each capital component being weighted according to its share in the company's capital structure. Further, it addresses situations where conventional WACC computations might oversimplify or fail to capture the nuances. This results in a more sturdy, precise WACC value that offers a better representation of the company's real cost of capital (Refinitiv, 2023b). In addition to the StarMine WACC, we also attain its respective cost of debt and cost of equity. The cost of capital, equity, and debt data ranges back to 2014, which shortens our sample period to 7 years.

The collected data is then used in a similar panel regression model as equation 3. Our model now is adjusted to regress the promised and realized ESG ratings on the WACC as shown in Equation (5). Our main interest is to see if the promised ESG rating decreases the cost of capital. If it is significantly negative, we can conclude that firms have incentives to promise more ESG initiatives to reduce their weighted average cost of capital.

$$\begin{aligned} WACC_{i,t} &= \alpha + \beta_1 * ESG_{i,k}^{Promised} + \beta_2 * ESG_{i,k}^{Realised} + \gamma_{i,t} + \varepsilon_{i,t} \\ COE_{i,t} &= \alpha + \beta_1 * ESG_{i,k}^{Promised} + \beta_2 * ESG_{i,k}^{Realised} + \gamma_{i,t} + \varepsilon_{i,t} \\ COD_{i,t} &= \alpha + \beta_1 * ESG_{i,k}^{Promised} + \beta_2 * ESG_{i,k}^{Realised} + \gamma_{i,t} + \varepsilon_{i,t} \end{aligned} \quad (5)$$

Hypothesis 3:

We hypothesize that firms can deliberately lower their cost of capital, equity, or debt through promises of future sustainability. (5)

$$H_0: \beta_{promised} > 0$$

$$H_1: \beta_{promised} < 0$$

4.4 Portfolio Allocation

We will now check if there is any relationship between institutional investors and an increase in ESG ratings. By doing so we can see if investors face an adverse selection problem when screening for their portfolio. Lastly, we will introduce 6 portfolios, one for the top 10% of companies and one for the bottom 10%, for Refinitiv rating, promised- and realized rank respectively. These are then compared to see if there is a difference in financial performance.

4.4.1 Institutional investors

We want to investigate what potential outcomes inflated ESG ratings have on investment decisions. In other words, we want to check if the ESG ratings have an effect on the screening process and the overall performance of portfolios.

Hypothesis 4:

We hypothesize that firms ESG ratings are positively associated with institutional investors. (6)

$$H_0: \beta_{Refinitiv} < 0$$

$$H_1: \beta_{Refinitiv} > 0$$

We start by analyzing the relationship between the number of institutional investors from the Wharton database and the ESG ratings provided by Refinitiv. This is again achieved by running a panel regression that combines the cross-sectional dimension of both the company and the time-series dimension. Since we want to investigate the relationship between ESG ratings and the screening process of investors, we set

the dependent variable as the number of institutional investors and the Refinitiv rating as the independent variable. Additionally, we also use fixed effects to neutralize most potential omitted variable bias. Lastly, we attempt to avoid potential heteroskedasticity or serial correlation in the error term by implementing robust standard errors. This gives us equation 6:

$$Institutional_{i,t} = \alpha + \beta_1 * ESG_{i,k}^{Refinitiv} + \gamma_{i,t} + \varepsilon_{i,t} \quad (6)$$

4.4.2 Comparing ESG Screened Portfolio Performance

Lastly, we look at the effects of inflated ESG on the portfolio allocation by comparing the performance of our realized and promised scores with the ESG ratings provided by Refinitiv. We want to find out if our calculated realized ratings can be used as a tool in investment decision-making by comparing the abnormal returns of 6 different portfolio screens. To do this we use a screening process that creates a long portfolio for the top and bottom 10% realized, promised, and Refinitiv ESG-rated companies. Next, we run these screens on a Fama-French 5-factor model including the momentum factor for an equally weighted portfolio. Since our thesis is based on annual terms, we retrieve the annualized Fama-French factors as well as annualize the returns over 9 years for all companies to fit the other variables. We run the model for two sample periods. One for the entire 9 years and one for the Covid-19 period 2020-2021 to check for abnormalities under uncertain times. This gives the Equation (7) below.

$$R_{it} - R_{Ft} = \alpha_i + \beta_1(R_{Mt} - R_{Ft}) + \beta_2SMB_t + \beta_3HML_t + \beta_4RMW_t + \beta_5CMA + \beta_6MOM + \varepsilon \quad (7)$$

Our dependent variable (R-RF) represents the company returns minus the risk-free rate. This is regressed on the Market Risk Premium (MRP) which is the excess return of investing in the market portfolio. As well as the Small Minus Big (SMB) factor that represents the historical excess returns of small-cap over large-cap companies. Next is the High Minus Low (HML) factor showing the historical excess returns of value stocks over growth stocks. Then the Robust Minus Weak (RMW) factor is the spread in returns between high and low-profitable companies. Following is the Conservative Minus Aggressive (CMA) indicating the difference in returns between firms that invest conservatively and firms that invest aggressively. And lastly, Momentum (MOM) is the continuous tendency of historically well-performing and historically under-performing firms.

5 RESULTS

In this section, we first prove that promises of future sustainability inflate ESG Ratings. Then we show that an inflated ESG rating causes reduced capital costs. Following we are showing that an increase in ESG ratings attracts additional institutional investors. Further, we show how the different ratings vary in terms of portfolio performance. Lastly, we analyze how ESG rating inflation causes problems for socially responsible investors.

5.1 Promised and Realized Ranking

The key components in our research are promised and realized ESG ratings. To create these ratings, it is crucial to separate ESG data into the correct categories and ESG type, additionally, the firms must be ranked by sector and year. To achieve this, we are implementing the sorting and ranking algorithm mentioned in Equations (1) and (2). This is used on the granular ESG data from Refinitiv and gives the following scores shown in Table 3. Figure 1 displays the development of the promised, realized, and Refinitiv ratings over time. Here we can already see that there is a clear relationship between the promised ESG and Refinitiv ESG rating. We also observe a negative trend in realized ESG. This indicates that ratings are mostly driven by promised ESG initiatives.

This table shows the average Promised, Realized and Refinitiv ESG ratings for each year.			
Year	Promised	Realized	Refinitiv
2021	68,57	49,96	57,52
2020	64,28	49,42	55,10
2019	60,90	48,60	52,96
2018	58,20	48,36	50,51
2017	56,32	47,95	48,34
2016	53,99	46,45	46,01
2015	52,60	50,16	44,47
2014	51,64	50,65	43,47
2013	50,63	52,77	42,55

Table 3: Average Refinitiv ESG rating, and average Promised and Realized scores. Investigate

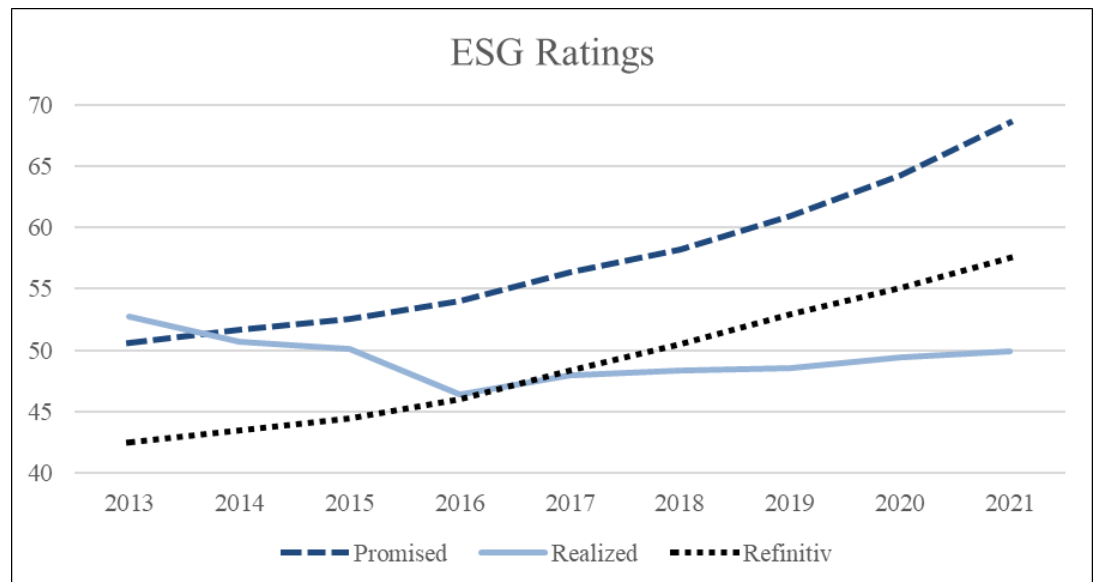


Figure 1: ESG ratings

There might be several reasons for this trend. First, we must look at this in light of the growing market demand for sustainable practices. Investors are increasingly screening for potential investments based on ESG ratings, and companies must improve their ESG performance by increasing all aspects of sustainability. To combat this companies promise more ESG initiatives to be perceived better in the eyes of not only investors but the whole society. Another reason for this trend can be shifts in the regulatory environment. The data for promised ESG ratings are based on activities, policies, reporting, and targets, meaning that the companies are now required to report more on future improvements. They also need to show a willingness to change their business models and be prepared to comply with environmental goals to remain relevant. From our calculated ratings the question of greenwashing comes to mind when we see that companies promise more initiatives but are still having the same controversies and sustainable performance resulting in slightly declining realized ESG ratings.

5.2 Inflated ESG Ratings

In Table 4 we display a panel regression of promised and realized scores on respective Refinitiv ESG scores. By implementing our methodology from equation (3) we find significant evidence that companies can increase their overall ESG rating by promising more ESG. Subsequently, we find no specific increase in their ESG rating by realizing their initiatives, rather the rating decreases.

Our model includes 23841 firm-year observations composed of a timeline of 9 years for a sample of 2649 companies. We run the regression with and without fixed effects, as well as including robust standard errors. For all regression, we observe a positive relationship between the promised ESG and Refinitiv ESG ratings. We also observe a weak or negative relationship between the realized ESG and Refinitiv rating. The economic interpretation of these results is that if a company increases its Promised ESG rank by one unit it will on average increase its Refinitiv rating by 0.677. If they however increase the realized ESG rank with one unit, the Refinitiv rating will on average be reduced by 0.103 units. We also observe high adjusted R-squared suggesting that a large proportion of the variability in the Refinitiv rating is explained by our promised and realized ranks. The model shows robust results with an average R-squared of 0.9225. In economic terms, this means that 92% of the variance in ESG ratings can be explained by our model. This is not surprising given that the Refinitiv rating and our promised and realized ratings are based on the same dataset. Our model shows significance for both the promised and realized coefficients with a p-value of <0.0001. Given the low p-values, we reject our null hypothesis. We conclude that our model strongly suggests that ESG ratings are inflated since you can increase your rating by promising future ESG initiatives.

These results should be surprising since one would think that doing actual ESG-related activities should yield a better score, but in this case, we observe the exact opposite. We see that it benefits a company to promise more than actually realizing them. In the next part, we will investigate this further.

This table run a panel OLS regression of *Promised* and *Realized* ESG scores on the Refinitiv Eikon ESG ratings of firms as given in equation (3). Column (1) to (3) use Refinitiv Eikon rating as dependent variable. Firm clustered standard errors are given in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

	(1)	(2)	(3)
Variables			
Promised	0.8399*** (0.0073)	0.8121*** (0.0084)	0.6770*** (0.0129)
Realized	-0.0998*** (0.0077)	-0.0965*** (0.0078)	-0.1034*** (0.0060)
Observations	23841	23841	23841
Adjusted R-Squared	0.7474	0.7607	0.9225
Size	NO	YES	YES
Country FE	NO	YES	YES
Firm FE	NO	NO	YES

Table 4: The impact of promised and realized ESG performance on Refinitiv Eikon ratings.

We then investigate if companies follow through on their ESG promises. We further extend from the last analysis by implementing a lagged regression model as shown in equation (4). In our model, the dependent variable is realized ESG scores, and the independent variable is lagged promised ESG scores from (t) to t-8. Results from the lagged regression hold true for all eight years where we can see a consistent negative relationship between realized and promised ESG scores. The coefficients are at minimum -0.160 and maximum -0.239 all statistically significant at the 1% level. We therefore also reject the second null hypothesis that the coefficients of the lagged promised scores is greater or equal to zero.

Our calculations in Table 4 show that promises of future sustainable performance negatively forecast the companies' realized sustainable performance in our sample. This suggests that ESG ratings are inflated now and over time, meaning that firms commit to future sustainable performance but are not realizing them.

The findings reinforce the results from the previous model and corroborate existing research that brought up concerns about the credibility of firms' ESG ratings and the incentives of firms' ESG initiatives. A correlation matrix of the lagged promised and current realized ranking can be seen in the appendix.

This Table regress the Promised ESG score over the past 9 years on current realized ESG scores. Each regression coefficient represents the parameter estimate of individual regression of current and lagged promised ESG scores on realized ESG scores. Observations and adjusted R² represent the average over the 16 regressions in each column. The dependent and independent variables is the realized and promised ESG respectively. Firm clustered standard errors are given in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

Variables	Realized $_{i, t-1}$
Promised $_{i,t}$	-0.2085*** (0.024)
Promised $_{i, t-1}$	-0.2396*** (0.023)
Promised $_{i, t-2}$	-0.1899*** (0.023)
Promised $_{i, t-3}$	-0.1959*** (0.021)
Promised $_{i, t-4}$	-0.1732*** (0.021)
Promised $_{i, t-5}$	-0.1691*** (0.021)
Promised $_{i, t-6}$	-0.1600*** (0.021)
Promised $_{i, t-7}$	-0.1768*** (0.021)
Promised $_{i, t-8}$	-0.1676*** (0.020)
Observations	2649
Adjusted R-squared	0.137
Size	YES
Country FE	YES

Table 5: The impact of current promised ESG scores on future realized ESG scores.

5.3 Cost of Capital Reduction

This section shows that inflated ESG ratings lower the cost of capital. This can be observed in Table 6 where we run firms' Refinitiv ESG ratings on their respective cost of capital, equity, and debt. Inflating companies' ESG ratings can result in them being regarded as being better and less risky, which in turn reduces their underlying capital costs. This can have consequences for wrongful valuations, loans, and investment decisions.

Our sample is reduced here to 6 years since we have fewer data for the cost of capital than our other datasets. The regression model consists of 2649 companies summing up to a total of 15,894 observations in total. We account for control variables as size, and country, sector, and firm fixed effects. Our table displays in

column (1) all effects excluding the firm fixed effect while in column (2) we are implementing all effects. Our regression is also implementing firm clustered standard errors displayed in the parentheses.

Our models show that a higher Refinitiv ESG rating consistently reduces the firm's cost of capital. We see that a one-unit increase in the Refinitiv rating reduces the WACC by -0.0364 in column (1). Additionally, we see a stronger negative relationship of -0.1092 in column (2), which also incorporates firm-specific fixed effects. The cost of debt has a similar effect, as seen in column (1) with a coefficient of -0.0258 and in column (2) with -0.1463. Lastly, the cost of equity follows a similar trend with -0.0175 in column (1) and -0.0448 in column (2).

Comparing this to our realized scores we see a negative and significant impact of -0.0276 and -0.0096 on the WACC. We also see a negative relationship on the cost of debt with -0.0582 in column (1) but an insignificant relationship when accounting for firm-fixed effects. A similar negative relationship also applies to the cost of equity whereas all coefficients are statistically significant.

Lastly, our main regression of interest, the promised ratings, displays the greatest negative effect of them all with -0.0478 in (1) and -0.1119 in column (2) on the WACC. There is also a negative relationship for the cost of debt with -0.1204 column (2) and the cost of equity column (2) with -0.049. All coefficients are statistically significant. For the promised ratings the adjusted r-squared is 0.382 for the cost of capital meaning that there still is some explanatory power missing, though this is expected. Based on our numbers we can reject the null hypothesis that the coefficient of promised ratings has an increasing or no effect on the cost of capital and that the rating causes a reduction in the cost of capital.

Comparing our results to prior models we see that higher ESG ratings lower the cost of capital, which support the claims of Goss & Roberts (2011). Additionally, we show the disparity of promised and realized ESG ratings, meaning that companies can inflate their ratings to further decrease their cost of capital and other beneficiary measurements. We see an effect of promising more ESG causes greater reduction in the cost of capital. If companies are promising but not undertaking as we see from the prior models to appear better, it may provide a short-term decrease in the cost of capital, but it can eventually cause significant risks for investors in

the long-term. A correlation matrix of the different elements in the cost of capital regression can be seen in the appendix.

This table shows the impact of ESG rating on a firms cost of capital. We regress weighted average cost of capital, cost of debt, and cost of equity separately on Refinitiv ESG rating, and promised and realized scores. Cost of debt captures interest expense and bond yield spread. The weighted average cost of capital weighs cost of equity and cost of debt by the book based leverage ratio. Firm clustered standard errors are given in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

Variables	WACC		Cost of Debt		Cost of equity	
	(1)	(2)	(1)	(2)	(1)	(2)
Refinitiv rating	-0.0364*** (0.010)	-0.1092*** (0.015)	-0.0258 *** (0.008)	-0.1463*** (0.018)	-0.0175 *** (0.008)	-0.0448** (0.015)
Observations	15858	15858	15858	15858	15858	15858
Adjusted R-Squared	0.1738	0.3810	0.2860	0.5660	0.2860	0.664
Size	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES
Firm FE	NO	YES	NO	YES	NO	YES

Variables	WACC		Cost of Debt		Cost of equity	
	(1)	(2)	(1)	(2)	(1)	(2)
Promised	-0.0478*** (0.01)	-0.1119*** (0.011)	-0.0339*** (0.007)	-0.1204 *** (0.017)	-0.0233 *** (0.008)	-0.0490 *** (0.014)
Realized	-0.0276** (0.006)	-0.0096 (0.016)	-0.0582*** (0.008)	-0.0070 (0.011)	-0.0528*** (0.007)	-0.0213** (0.010)
Observations	15858	15858	15858	15858	15858	15858
Adjusted R-Squared	0.0172	0.382	0.2733	0.566	0.288	0.664
Size	YES	YES	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES	YES	YES
Country FE	YES	YES	YES	YES	YES	YES
Firm FE	NO	YES	NO	YES	NO	YES

Table 6: The impact of ESG ratings on cost of capital

5.4 Portfolio allocation

This section investigates if there is an increasing adverse selection problem caused by inflated ESG ratings. We analyze this by looking at the screening process of institutional investors. In other words, if companies inflate and attain a higher ESG rating they are attracting more investors.

5.4.1 Institutional investors

To see if the ESG ratings have an including effect on institutional portfolios we collect historical ownership data from the Wharton database. Here we attain the total number of institutional owners. Though there are some limitations to this over ownership percentage, we see this variable as reasonable since it takes away other portfolio factors and solely focuses on the attraction aspect of ESG-related screens.

In table 7 we see a statistically significant positive association between the Refinitiv rating and the number of institutional owners. Our model estimates a significant

coefficient of 0.4230 for the Refinitiv rating with all fixed effects and a robust standard error of 0.0353. Similar relationships are also found for the other regressions with fewer control variables. From this we can reject the null hypothesis of no association and accept the alternative of a association between ratings and the number of institutional investors. On another note, there are other factors like performance and risk that our model does not account for. This gives us an R-squared of 0.3682, meaning that while our model provides important insights, further research is suggested. Additionally, we run the same regression for the promised and realized rating. Here we find that the promised ratings have a positive significant relationship with the number of institutional investors by a coefficient of 0.4022. For the realized rating we find an insignificant negative relationship with all fixed effects and a low significant effect for the others. Overall, our model suggests that if ESG ratings are inflated, companies can be included in a greater number of screens by institutional investors.

This table shows the impact of ESG rating on the number of institutional investors. We regress the ESG ratings separately for the Refinitiv rating and combined for the promised and realized on the number of institutional investors. Firm clustered standard errors are given in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

Variables	INSTITUTIONAL INVESTORS		
	(1)	(2)	(3)
Refinitiv	0.3933*** (0.0373)	0.3729*** (0.0364)	0.4230*** (0.0353)
Observations	5949	5949	5949
Adjusted R-Squared	0.1542	0.2129	0.3682
Industry FE	NO	YES	YES
Country FE	NO	NO	YES

Variables	INSTITUTIONAL INVESTORS		
	(1)	(2)	(3)
Promised	0.3791*** (0.0359)	0.3654*** (0.0346)	0.4022*** (0.0335)
Realized	0.0940*** (0.0283)	0.0517* (0.0277)	-0.0225 (0.0254)
Observations	5949	5949	5949
Adjusted R-Squared	0.1360	0.2015	0.3556
Industry FE	NO	YES	YES
Country FE	NO	NO	YES

Table 7: Impact of ESG rating on number of institutional investors

5.4.2 Fama-French 5-factor Model with Momentum

Our application of the Fama-French 5-factor model with momentum in Table 8 yields several notable findings. The alpha shows significant returns for all the different portfolios. Starting with the alphas for the top 10% we find significant positive returns for all the portfolios. The top portfolio that contains the highest alpha of 0.0833 is the Refinitiv portfolio followed by the realized at 0.0628 and promised with 0.0483. This differs from other work that has found negative abnormal returns for high ESG-rated portfolios. Comparing these to the low portfolios we see that the realized has the overall highest alpha of all portfolios with 0.1010. This implies that the companies that show fewer ESG initiatives and may have more controversial action actually yield a greater return than others, which is different from the studies of Glossner (2017) that found negative returns for more controversial stocks. The other low portfolios have an alpha of 0.0518 for the promised and the Refinitiv with 0.0274.

Moving on to the other factors we see that all portfolios show a positive significant relationship with the market excess return meaning that the portfolios are sensitive to overall market movements. Similar numbers can be seen for the small-minus-big factor implying that the portfolios tend to have a bias toward small-cap stocks. The robust minus weak (RMW) factor, which signifies profitability, is only significant for the realized High portfolio, indicating that this portfolio leans towards profitable companies. The high-minus-low representing the value factor shows a negative relationship for all portfolios suggesting a growth stock bias. The CMA, conservative minus aggressive, factor is positive for all portfolios though not significant for the Refinitiv low and Promised low. For the others, this means that they have a preference for firms with less aggressive investment strategies. The momentum factor is negative and significant for all portfolios indicating a tendency to invest in stocks that have recently underperformed.

Risk, measured by standard deviation, and the Sharpe ratio showing risk-adjusted returns, vary across the different portfolios. The Refinitiv Low and Realized portfolios demonstrate higher standard deviations than the other portfolios, indicating greater volatility. The Sharpe ratio is highest for the Refinitiv High and Realized High portfolios, suggesting better performance per unit of total risk

taken. Lastly, we see a low adjusted R-squared for all the respective portfolios indicating that the returns are missing some explanatory effect from the factors.

We conclude that there is no concrete advantage of choosing one portfolio over the other as the results are somewhat conflicted. If we look at the low realized ratings that yielded the highest returns, our results support the research of Hong & Kacperczyk (2009) where they found that companies perceived as less sustainable yield higher returns than better ESG companies. Nevertheless, when we look at the Refinitiv ratings we find that firms with higher ratings have higher returns than the ones with lower ratings which contradicts their claims. Additionally, we find no indication that the companies promising more ESG initiatives outperform the other portfolios in terms of returns. For further research, we will suggest running a similar portfolio screen for different samples to see if the effects still hold. Based on our results we will suggest that a socially responsible investor should use the realized ratings. By doing so they are not only assured that their moral compass is met but they are also better prepared for potential controversies or crises. In Table 9 in the appendix, we have checked the last claim by running a similar Fama-French model for the same sample during the Covid-19 Crisis. From the results we clearly see that the realized portfolios outperform the other portfolios in terms of alpha and Sharpe ratios, indicating that the companies that realize their ESG initiatives might be better suited and more robust when facing a crisis in the market.

This table shows a FAMA and French 5 factor model with momentum. The model is ran on 6 different portfolios. Refinitiv high and low is based on the Refinitiv ESG ratings, while the Realized/Promised high and low is based on our calculated ratings. Additionally, we have the Fama-French factors, including momentum: MKT is the excess market return, SMB is the small-minus-big factor, HML is the high-minus-low factor, and MOM is the momentum factor, RMW is the robust minus weak factor, and CMA is the conservative-minus aggressive factor. Standard errors are given in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

FAMA-FRENCH 5 FACTOR WITH MOMENTUM										
ESG Portfolios	α	Mkt-RF	SMB	HML	RMW	CMA	MOM	Adj R-Squared	Std	Sharpe ratio
Refinitiv High	0.0833*** (0.018)	0.5594 *** (0.046)	1.2401*** (0.236)	-0.3963* (0.226)	0.0474 (0.215)	1.0093** (0.437)	-0.8613*** (0.136)	0.106	0.3336	0.2283
Refinitiv Low	0.0274 (0.023)	0.6077*** (0.079)	2.0914*** (0.316)	-0.3281 (0.408)	0.9826** (0.414)	0.8019 (0.790)	-1.0946*** (0.170)	0.073	0.4861	0.0883
Realized High	0.0628** (0.026)	0.5836*** (0.071)	1.8810*** (0.346)	-1.2417*** (0.351)	1.1110*** (0.408)	2.5690*** (0.644)	-1.1131*** (0.192)	0.058	0.5198	0.1793
Realized Low	0.1010*** (0.022)	0.5448*** (0.061)	1.8626*** (0.292)	-0.9825*** (0.295)	0.1766 (0.326)	1.9535*** (0.544)	-1.3583*** (0.165)	0.092	0.4485	0.1452
Promised High	0.0483*** (0.015)	0.5695*** (0.045)	1.0600*** (0.198)	-0.1393 (0.208)	0.2430 (0.225)	0.8298** (0.406)	-0.4348*** (0.111)	0.119	0.2987	0.1432
Promised Low	0.0518*** (0.020)	0.5709*** (0.077)	1.5450*** (0.284)	0.2609 (0.418)	0.1371 (0.350)	-0.5228 (0.810)	-0.6848*** (0.154)	0.053	0.4382	0.1287

Table 8: Fama-French 5-factor model with momentum

5.5 Implications of the Results

When it comes to the inflation of ESG Ratings our results indicate that promised ESG performances tend to influence ESG ratings significantly more than realized ratings. This finding is consistent with the concerns raised by Bams & van der Kroft (2022) about potentially inflated ESG ratings. Our results suggest that rating agencies are putting more emphasis on companies' future sustainability promises rather than their actual performances. Because of this, socially responsible investors that mainly rely on ESG ratings for their investment decisions end up making less sustainable investments. Our findings underline the importance of transparency and rigorous examination of ESG ratings, as emphasized by Bams & van der Kroft, (2022). Our suggested inflation of ESG ratings could lead to a scenario where investors are unwittingly supporting firms that are not genuinely sustainable.

Our analysis further reveals that a high ESG rating correlates with a lower cost of capital, aligning with the observations made by Goss & Roberts (2011). Companies with better ESG scores can be perceived as less risky, thus leading to more favorable financing terms. Due to the potential inflation of ESG ratings, this effect may cause problems in terms of wrongful cost of capital, valuation, risk assessment, and other important financial measures. Investors and creditors will therefore be underestimating the financial status and risks involved in companies with high ESG ratings. In line with the rising trend of ESG adoption among investors (Capital Group, 2022) we find the inflated ratings to be problematic since it can cause investment attraction towards the wrong companies. This is emphasized by our results that show an increase in the number of institutional investors when a company's ESG ratings increase. Though this needs to be further explored in terms of causality since there are several underlying factors such as profitability and solidity that can increase ESG ratings, lower cost of capital and attract investors.

Additionally, our performance findings are different from those of Glossner (2017) that companies with a history of breaching ESG regulations yield negative returns. However, as observed in the literature, the relationship between ESG implementation and financial performance remains complex and inconclusive, with some studies reporting positive correlations, others negative, and some finding no correlation at all (Kempf & Osthoff, 2007; Edmans, 2011; Schreck, 2011; Margolis

et al., 2009; Hong & Kacperczyk, 2009; Pástor et al., 2022). However, our study shows that actual returns are higher for companies that are doing good but differs in those that are perceived as bad. Though there might be causality issues with the results similar to Schreck (2011). Overall, our results suggest that only relying on ESG ratings may lead to suboptimal sustainable investment decisions. While ESG ratings can provide useful insights for investors, our research highlights the need for transparency. Investors should be aware of the potential inflation of ESG ratings and consider multiple sources of information when making investments.

6 Conclusion

Our research provides robust empirical evidence of inflated ESG ratings which aligns well with previous studies done by Bams & van der Kroft (2022). We conclude this based on 1) Promised ESG is the main driver of the Refinitiv rating, and 2) companies do not follow up these promises over time. We interpret this as rating agencies placing too much emphasis on non-committal claims about future sustainability measures compared to genuine sustainable performance. We also find evidence for incentives to inflate ESG rating since this will give firms a lower cost of capital, and therefore a competitive advantage. This will create a moral hazard for companies to promise more than they plan to implement. Further, the inflated ratings can result in an improved reputation of firms, which again can increase interest of institutional investors. We found no clearly dominant portfolio strategy for investors seeking maximal returns in investment based on the different ESG portfolio screens, yet all the portfolios still beat the market portfolio. This indicates that firm's financial performance does not solely rely on the ESG performance and ratings, rather there are other metrics that drive the price, as suggested by Cornell & Damodaran (2020) We still firmly believe that our realized ESG ranking can be a good alternative for socially responsible investors with the intention of promoting a sustainable future. might be useful to invest in companies with better realized scores since they might withstand more controversies and do better in uncertain times.

6.1 Further Research

As the world and climate is constantly changing, the importance of sustainable investing and reliable ESG metrics is crucial to capture an effective impact. We aspire to see corporations, ratings agencies and regulators working together to provide a transparent landscape for investors. We urge the scholarly community and academia to watch over and continue their research on this subject matter.

One suggestion would be to look at AI's ability to both detect inflated ESG rating and construct new detailed ratings based on all aspects of a company's operations. Another interesting approach for further research would be to repeat this analysis in a few years after directives on sustainability reporting have been integrated into legislation. It would be interesting to see if stricter regulations like EU directive on sustainability reporting (NOU 2023:15), are able to reduce companies' ability to inflate their ratings, and by this promote a sustainable future.

Further research and a collective effort from the industry can make the business world fairer and help levelling the playing field, so companies are rewarded for true sustainable actions. ESG metrics that are accurate and honest, can motivate companies to act more responsibly, which benefits the world in the long run. Together, we can make ESG a tool for good, guiding us towards a sustainable future.

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Appendix

Table 1: Granular ESG variables

This table provides an overview over the granular ESG variables.				
Promised ESG		Realized ESG		
Variable name	ESG type	Variable name	ESG type	
Animal testing	Activity	Accidental spills	Controversy	
Daycare service	Activity	Accounting controversies	Controversy	
Eco-design products	Activity	Climate change commercial risk	Controversy	
Emission trading	Activity	Controversies anti-competition	Controversy	
Environmenta linvestment initiatives	Activity	Controversies business ethics	Controversy	
Environmental material sourcing	Activity	Controversies consumer complaints	Controversy	
Environmental partnership	Activity	Controversies customer health	Controversy	
Environmental products	Activity	Controversies intellectual property	Controversy	
Environmental project financing	Activity	Controversies privacy	Controversy	
Environmental provisions / assets	Activity	Controversies public health	Controversy	
Environmental restoration initiatives	Activity	Controversies responsible marketing	Controversy	
Flexible working hours	Activity	Controversies tax fraud	Controversy	
Healthy food/products	Activity	Controversies wages working conditions	Controversy	
Human rights contractors	Activity	Controversy bribery corruption and fraud	Controversy	
Internal promotion	Activity	Environmental controversies	Controversy	
Organic product initiatives	Activity	Obesity risk	Controversy	
Product access low prices	Activity	Poisonpill	Controversy	
Product environmental responsibilities	Activity	Strikes	Controversy	
Product impact minimization	Activity	Accidents total/assets	Performance	
Product responsibility monitoring	Activity	CO_{2} Emissions	Performance	
Renewable energy products	Activity	Contractor human rights breaches	Performance	
Retailing responsibilities	Activity	Corporate responsibility awards	Performance	
Staff transportation impact reduction	Activity	Customer satisfaction	Performance	
Stakeholder engagement	Activity	Donations/revenue	Performance	
Supplier ESG-training	Activity	Electronic waste reduction	Performance	
Sustainable building products	Activity	Employee fatalities/assets	Performance	
Takeback and recycling initiatives	Activity	Employee satisfaction	Performance	
Trade union representation	Activity	Employees with disabilities	Performance	
Waste reduction initiatives	Activity	Employee turnover	Performance	
Water technologies	Activity	Energy usage	Performance	
Accounting controversies	Controversy	Environmental investment expenditures	Performance	
Climate change commercial risk	Controversy	Green buildings	Performance	
Controversies anti-competition	Controversy	Hazardous waste	Performance	
Controversies business ethics	Controversy	Health safety training	Performance	
Controversies consumer complaints	Controversy	HRC corporate equality index	Performance	
Controversies customer health	Controversy	Injury rate	Performance	
Controversies intellectual property	Controversy	Lost time injury rate contractors (%)	Performance	
Controversies privacy	Controversy	Net employment creation / assets	Performance	
Controversies public health	Controversy	NO_{x} and SO_{x} Emission reduction	Performance	
Controversies responsible marketing	Controversy	NO_{x} and SO_{x} Emissions	Performance	
Controversies tax fraud	Controversy	Occupational diseases	Performance	

Table 1 - continued			
Promised ESG		Realized ESG	
Variable name	ESG type	Variable name	ESG type
Controversies wages working conditions	Controversy	Ozon-depleting substances	Performance
Controversy bribery corruption and fraud	Controversy	Product recall	Performance
Environmental controversies	Controversy	Renewable energy ratio	Performance
Obesity risk	Controversy	Renewable energy usage	Performance
Poisonpill	Controversy	Salary gap (%)	Performance
Strikes	Controversy	Self-reported environmental fines	Performance
Accidents total/assets	Performance	Toxic chemicals reduction	Performance
CO ₂ Emissions	Performance	Training hours / assets	Performance
Contractor human rights breaches	Performance	VOC and particulate matter reduction	Performance
Corporate responsibility awards	Performance	VOC and particulate matter emissions	Performance
Customer satisfaction	Performance	Waste / assets	Performance
Donations/revenue	Performance	Waste recycled (%)	Performance
Electronic waste reduction	Performance	Water pollutant emissions	Performance
Employee fatalities/assets	Performance	Water recycled	Performance
Employee satisfaction	Performance	Water usage / assets	Performance
Employees with disabilities	Performance	Women employees	Performance
Employee turnover	Performance		
Energy usage	Performance		
Environmental expenditures / assets	Performance		
Environmental investment expenditures	Performance		
Green buildings	Performance		
Hazardous waste	Performance		
Health safety training	Performance		
HRC corporate equality index	Performance		
Injury rate	Performance		
Lost time injury rate contractors (%)	Performance		
Net employment creation / assets	Performance		
NO _x and SO _x Emission reduction	Performance		
NO _x and SO _x Emissions	Performance		
Occupational diseases	Performance		
Ozon-depleting substances	Performance		
Product recall	Performance		
Renewable energy ratio	Performance		
Renewable energy usage	Performance		
Salary gap (%)	Performance		
Self-reported environmental fines	Performance		
Toxic chemicals reduction	Performance		
Training hours / assets	Performance		
VOC and particulate matter reduction	Performance		
VOC and particulate matter emissions	Performance		
Waste / assets	Performance		
Waste recycled (%)	Performance		
Water pollutant emissions	Performance		
Water recycled	Performance		
Water usage / assets	Performance		
Women employees	Performance		
Biodiversity impact reduction	Policy		
Crisis management systems	Policy		
CSR sustainability committee	Policy		
Emission policy	Policy		
Employee engagement and voluntary work	Policy		
Employee health safety team	Policy		
Energy efficiency policy	Policy		
Environmental supplychain management	Policy		
Environmental supplychain policy	Policy		
Environment management team	Policy		
Environment management training	Policy		
Ethical trading initiatives	Policy		
Health safety policy	Policy		
HSMS certified percent	Policy		
Human rights compliance ILO/UN	Policy		
Integrated strategy in MDA	Policy		
Land environmental impact reduction	Policy		
OECD guidelines for multinationals	Policy		
Policy board diversity	Policy		
Policy bribery and corruption	Policy		
Policy business ethics	Policy		
Policy child labor	Policy		
Policy Community involvement	Policy		
Policy customer health safety	Policy		
Policy data privacy	Policy		
Policy diversity and opportunity	Policy		
Policy fair competition	Policy		
Policy fair trade	Policy		
Policy forced labor	Policy		
Policy human rights	Policy		
Policy responsible marketing	Policy		
Policy supplychain health safety	Policy		
Policy training and development	Policy		
Quality management systems	Policy		
Real estate sustainability certificate	Policy		
Resource reduction policy	Policy		
Six sigma and quality management system	Policy		
Sustainable packaging policy	Policy		
Water efficiency policy	Policy		
Whistleblower protection	Policy		
CSR sustainability external audit	Reporting		
ESG reporting scope	Reporting		
Global compact signatory	Reporting		
GRI reporting guidelines	Reporting		
Salaries / wages	Reporting		
Emission reduction target (%)	Target		
Emission targets	Target		
Energy efficiency targets	Target		
Resource reduction targets	Target		
Targets diversity and opportunity	Target		
Water efficiency targets	Target		

Table 9: Fama-French 5 factor model with momentum during covid-19 pandemic

This table shows a FAMA and French 5 factor model with momentum during the years 2020-2021. The model is ran on 6 different portfolios. Refinitiv high and low is based on the Refinitiv ESG ratings, while the Realized/Promised high and low is based on our calculated ratings. Additionally, we have the Fama-French factors, including momentum: MKT is the excess market return, SMB is the small-minus-big factor, HML is the high-minus-low factor, and MOM is the momentum factor, RMW is the robust minus weak factor, and CMA is the conservative-minus aggressive factor. Standard errors are given in parentheses. *, ** and *** denote significance at the 10%, 5% and 1% level, respectively.

FAMA-FRENCH 5 FACTOR WITH MOMENTUM DURING COVID-19										
ESG Portfolios	α	Mkt-RF	SMB	HML	RMW	CMA	MOM	Adj R-Squared	Std	Sharpe ratio
Refinitiv High	0.0881*** (0.011)	0.0251 *** (0.003)	-0.0293*** (0.005)	0.1676*** (0.033)	0.0288*** (0.004)	0.0806*** (0.016)	-0.0539*** (0.011)	0.048	0.2609	0.2567
Refinitiv Low	0.1148*** (0.026)	0.0312*** (0.007)	-0.0338*** (0.011)	0.1888*** (0.071)	0.0341*** (0.010)	0.0908*** (0.034)	-0.0602** (0.024)	0.013	0.5395	0.1702
Realized High	0.1894*** (0.029)	0.0442*** (0.008)	-0.0348*** (0.013)	0.1693** (0.081)	0.0393*** (0.011)	0.0816** (0.039)	-0.0507* (0.027)	0.007	0.6158	0.2805
Realized Low	0.0879*** (0.021)	0.0233*** (0.006)	-0.0243** (0.009)	0.1337** (0.062)	0.0248*** (0.008)	0.0248** (0.030)	-0.0423** (0.021)	0.007	0.4939	0.1453
Promised High	0.0908*** (0.013)	0.0283*** (0.003)	-0.0373*** (0.005)	0.2207*** (0.034)	0.0354*** (0.005)	0.1061*** (0.016)	-0.0719*** (0.011)	0.074	0.2795	0.1001
Promised Low	0.0686*** (0.020)	0.0150*** (0.077)	-0.0097 (0.284)	0.0416 (0.418)	0.0119 (0.350)	0.0201 (0.810)	-0.0116 (0.154)	0.001	0.4431	0.1482

Table 10: Correlation matrix of Promised, Realized and Refinitiv rating, and Cost of capital.

This table shows the correlation matrix of the variables used in equation 5 whereas the results are displayed in table 5.

Correlation Matrix Cost of Capital						
	Promised	Realized	Refinitiv	WACC	COE	COD
Promised	1.000000	-0.189297	0.847041	-0.078885	-0.059531	-0.088414
Realized	-0.189297	1.000000	-0.255682	0.010210	-0.045976	-0.023706
Refinitiv	0.847041	-0.255682	1.000000	-0.077431	-0.067975	-0.071500
WACC	-0.078885	0.010210	-0.077431	1.000000	0.605461	0.272314
COE	-0.059531	-0.045976	-0.067975	0.605461	1.000000	0.355761
COD	-0.088414	-0.023706	-0.071500	0.272314	0.355761	1.000000

Table 11: Correlation matrix of lagged promised and current realized ratings.

This table shows the correlation matrix for the lagged promised scores and the current realized score used in equation 4 and displayed in table 5.

Correlation Matrix Lagged Promised Ratings										
	Promised t	Promised t-1	Promised t-2	Promised t-3	Promised t-4	Promised t-5	Promised t-6	Promised t-7	Promised t-8	Realized t
Promised t	1.000000	0.942123	0.859237	0.796681	0.762901	0.734295	0.707999	0.694330	0.677671	-0.200156
Promised t-1	0.942123	1.000000	0.905040	0.845796	0.812755	0.781947	0.756223	0.739661	0.714175	-0.230312
Promised t-2	0.859237	0.905040	1.000000	0.881353	0.843737	0.805350	0.771632	0.751733	0.726961	-0.198892
Promised t-3	0.796681	0.845796	0.881353	1.000000	0.892863	0.852973	0.818216	0.779852	0.757507	-0.199148
Promised t-4	0.762901	0.812755	0.843737	0.892863	1.000000	0.908353	0.876300	0.842581	0.811596	-0.177011
Promised t-5	0.734295	0.781947	0.805350	0.852973	0.908353	1.000000	0.919490	0.887976	0.858834	-0.168512
Promised t-6	0.707999	0.756223	0.771632	0.818216	0.876300	0.919490	1.000000	0.940537	0.907876	-0.168840
Promised t-7	0.694330	0.739661	0.751733	0.779852	0.842581	0.887976	0.940537	1.000000	0.942437	-0.177378
Promised t-8	0.677671	0.714175	0.726961	0.757507	0.811596	0.858834	0.907876	0.942437	1.000000	-0.171545
Realized t	-0.200156	-0.230312	-0.198892	-0.199148	-0.177011	-0.168512	-0.168840	-0.177378	-0.171545	1.000000

Table 12: Correlation Matrix Fama and French Factors

This table shows the correlation matrix of the fama french factors used in the different portfolios. MKT is the excess market return, SMB is the small-minus-big factor, HML is the high-minus-low factor, and MOM is the momentum factor, RMA is the robust-minus-weak factor, and CMA is the conservative-minusaggressive factor.

Correlation Matrix Fama and French 6 factors							
	Mkt-RF	SMB	HML	RMW	CMA	RF	MOM
Mkt-RF	1.000000	0.151688	-0.004452	0.212256	0.009772	-0.087391	0.253324
SMB	0.151688	1.000000	-0.010727	-0.523362	-0.025523	-0.472424	0.278872
HML	-0.004452	-0.010727	1.000000	-0.164615	0.979231	-0.294623	-0.584328
RMW	0.212256	-0.523362	-0.164615	1.000000	-0.233793	0.129188	-0.002546
CMA	0.009772	-0.025523	0.979231	-0.233793	1.000000	-0.283424	-0.554601
RF	-0.087391	-0.472424	-0.294623	0.129188	-0.283424	1.000000	-0.140913
MOM	0.253324	0.278872	-0.584328	-0.002546	-0.554601	-0.140913	1.000000

Table 13: Distribution Density Promised Ratings

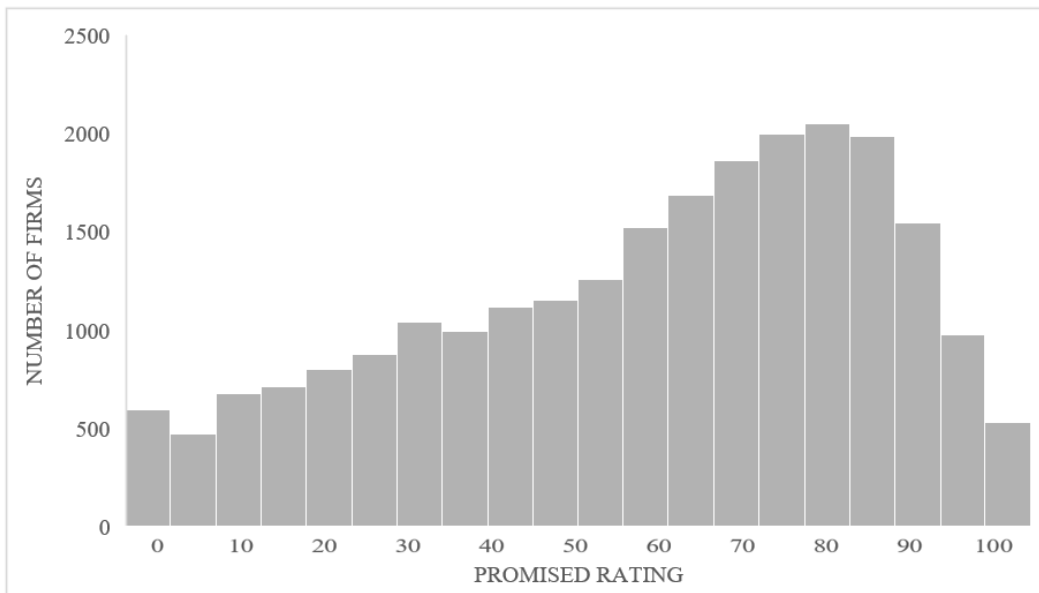


Table 14: Distribution Density Realized Ratings

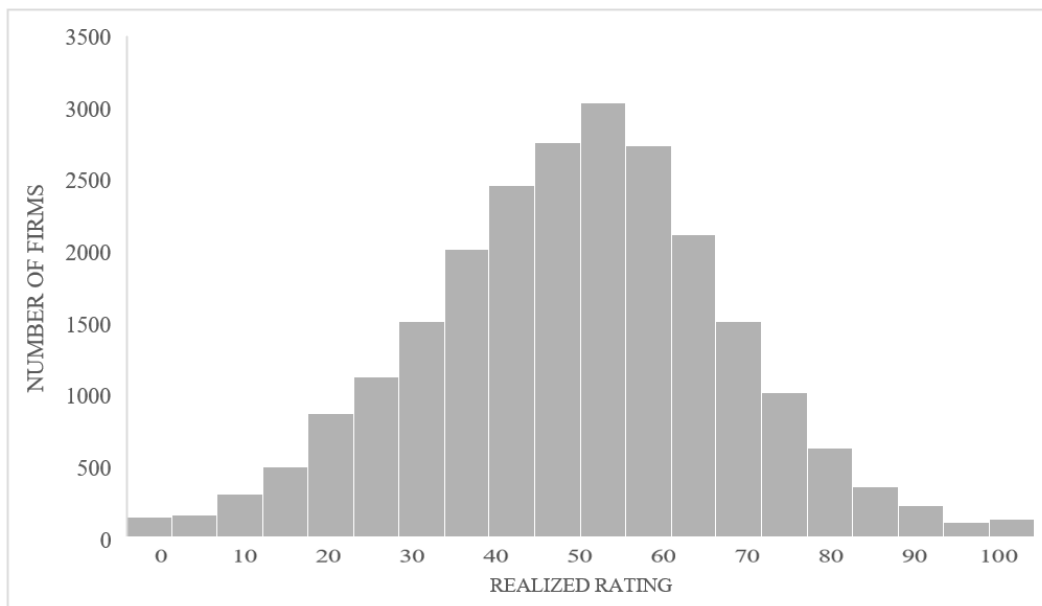


Table 15: Distribution Density Refinitiv Ratings

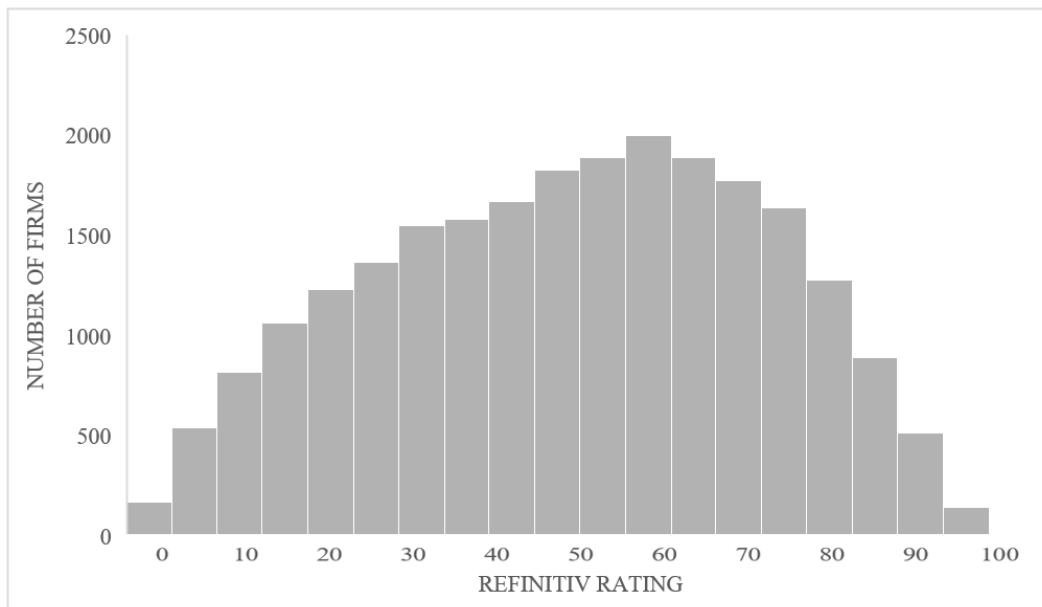


Figure 2: Portfolios Returns

This table shows the yearly returns (2013-2021) for the different portfolio screens Refinitiv High/Low, Realized High/Low and Promised High/Low.

