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Can sustainability criteria enhance returns and reduce risk  
on mutual funds?

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## **Abstract**

The aim of the thesis is to investigate whether sustainability criteria enhance returns and reduce risk on mutual funds. Past research has not provided a conclusion on whether ESG asset managers can outperform the market or not. We empirically study the mutual fund performance of ESG criteria based on Carhart (1997) model, which is a four-factor model. The data will be collected from Morningstar.

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# 1.0 Introduction

Nowadays, sustainable investment is booming. Researchers in the field of finance have not yet reached a conclusion about the relationship between sustainability and performance of mutual funds. Therefore, the key issue we want to address in this thesis is:

*Can sustainability criteria enhance returns and reduce risk on mutual funds?*

As a proxy for sustainability, the Morningstar Sustainability Rating is used. It provides a reliable objective way to evaluate how investments are meeting environmental, social and governance (ESG) challenges. This ESG criteria makes it possible for investors to find sustainable mutual funds even though the funds are not marketing themselves supporting a sustainable approach.

From an investor's perspective, there exists a debate about the benefits of integrating sustainability criteria into the investment process, and the degree to which it results in a positive or negative return. Recently, the topic has become a hot research topic, but often the studies focuses on a single country. The Norwegian market has until today received insufficient attention, nonetheless the country has a very high living standard that creates the right conditions for good ESG policies. In fact, it has recently been ranked as the best sustainability performer according to the Country Sustainability Ranking as of October 2016 (RobecoSAM and Robeco, 2016). As the data have recently become easily accessible for the public, it is motivating to study the link between sustainability and financial performance on the Norwegian market. This thesis is limited to equity mutual funds owned by companies domiciled in Norway.

The remainder of this paper is composed as follows. Chapter 2 provides background on sustainability measures. Chapter 3 summarized the existing literature on sustainability, and chapter 4 provides fundamental theories related to our research topic. In chapter 5, we discuss the methodological approach selected to perform the study.

## 2.0 Background

It is useful to have a common understanding of the investment approach that incorporate environmental, social and governance issues into the investment process. The following section will explain the term socially responsible investing (SRI) and ESG, as well as giving further background materials about the Morningstar Sustainability Rating.

### 2.1 From SRI to ESG

The term SRI have become a familiar part of the vocabulary of institutional and investors. This can be emphasized by a recent Morgan Stanley survey, which reported that 71% of investors were interested in sustainable investing.

Traditionally, SRI was about the alignment of investments and the values of the investor. Common themes that were inconsistent with the value of the SRI investors were typically gambling, tobacco, alcohol etc. Investors practiced this by avoiding investments in companies that offer such products. The asset managers easily implemented the exclusion strategy of such themes, but those investors with values concerning sustainability were missing a reliable basis for selection of mutual funds. Investors required more information about companies' behavior related to ESG issues. Researchers addressed this by creating ESG evaluations, where the companies that do well on these evaluations indicate sustainable companies. Even though investors use slightly different measures of ESG, some common examples are presented in the table below. Still, it is often difficult to classify an ESG issue as only an environmental, social or governance issue, as they are often interlinked.

**Exhibit 1** ESG Issues

Environmental Issues	Social Issues	Governance Issues
<ul style="list-style-type: none"> <li>• Climate change and carbon emissions</li> <li>• Air and water pollution</li> <li>• Biodiversity</li> <li>• Energy efficiency</li> <li>• Waste management</li> <li>• Water scarcity</li> </ul>	<ul style="list-style-type: none"> <li>• Customer satisfaction</li> <li>• Data protection and privacy</li> <li>• Gender and diversity</li> <li>• Employee engagement</li> <li>• Community relations</li> <li>• Human rights</li> </ul>	<ul style="list-style-type: none"> <li>• Board composition</li> <li>• Audit committee structure</li> <li>• Bribery and corruption</li> <li>• Executive compensation</li> <li>• Lobbying</li> <li>• Political contributions</li> <li>• Whistle-blower schemes</li> </ul>

Source: *Environmental, Social, and Governance Issues in Investing: A Guide for Investment Professionals*, CFA Institute

Reasons for including ESG criteria for an investor can be several. Some might see them as a source of economic value, while others care more about the alignment of their moral values. This means that the latter group might not invest in an economically desirable mutual funds, if doing so would contradict a value. The first group might use the ESG criteria as a complementary tool in the process examining the investment's valuation and risk, in addition to traditional financial analysis.

## **2.2 The Morningstar Sustainability Rating**

As a pioneer for the Norwegian market, Morningstar has published a sustainability rating on mutual funds, which is publicly available for investors. The rating is a measure of how well the holdings in a portfolio are managing their ESG relative to their Morningstar Category peers, and uses company-level ESG analytics from Sustainalytics. The calculation is both based on company-level ESG scores and involvement in ESG-related controversies, and are evaluated within global industry peer groups. (Morningstar, 2016)

## 3.0 Literature Review

In 2009, Hong and Kacperczyk found that “sin stocks” outperform market benchmark in the US. Sin stocks are stocks that promote vice, that is, alcohol, tobacco and gaming firms. They further argued that these stocks are neglected by investors because of social norms, and are undervalued. Yet, this research has been criticized as it compares sin stocks (which are not value-weighted) with a value-weighted benchmark. Since small-cap stocks tend to outperform large-cap stocks their finding might be biased. To cope with this, Lobe and Walkshäusl (2011) studied similar value-weighted sin stock and found that value-weighted portfolios do not significantly outperform their benchmarks. Still, there is a lack of applicability of earlier research since it relies on a different definition of sustainability.

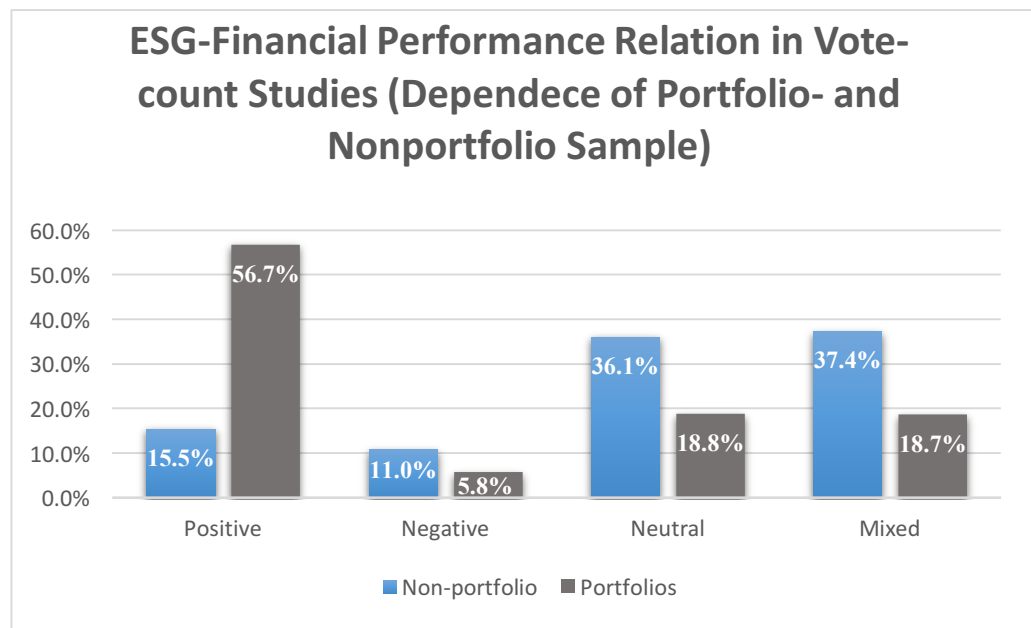
Research using ESG criteria is relatively new. An analysis concluded that 85% of the studies were focusing on one ESG dimension only. (United Nations Environment Program Finance Initiative and Mercer Investment Consulting, 2007). Results have been mixed, but these studies are often criticized due to the interconnection of the three dimensions. A common conclusion of studies where all three dimensions are examined is that companies with high ESG score are associated with less company-specific risk, lower cost of debt and higher credit ratings (Bauer et al., 2009; Bauer and Hann, 2011, Lee and Faff, 2009, cited in Hoepner, 2013).

In 2015, an extensive global vote-count and meta-analysis of 85 primary studies were published by Revelli and Viviani. They found no significant relationship between SRI and financial performance, and concluded:

"We can assert that there is no significant relationship between SRI and performance. Thus, the adoption of ESG standards does not generate notable costs or benefits for an investor with a global perspective, challenging the theory of SRI inefficiency, which implies poorer performance due to a limited investment universe."

Later in 2015, Friede et al. (2016) analyzed the difference between non-portfolios and portfolios related to ESG, which is considerable evident using the vote-count methodology. Making this distinction is important as mutual funds performance often deviate from primary company. Their finding is shown in the figurer below, e.g. the share of positive results is 56.7% for non-portfolios and 15.5% for portfolios.

**Exhibit 2** Sustainable/Responsible Fund Performance Study Outcomes



*Source: Friede, G., Busch, T., and Bassen, A. (2015). "ESG and Financial Performance: Aggregated Evidence From More Than 2000 Empirical Studies." Journal of Sustainable Finance & Investment, Vol. 5, No. 4, P. 221.*

So far, research has not produced a comprehensive answer to the link between sustainability and mutual funds financial performance. This might be partly due the discussion of active versus passive management, where literature claims that an active mutual fund manager tends to fail to outperform the benchmark on the long run. Dr. Andreas G. F. Hoepner (2013) points out that most financial market trades involve a fund manager on each side of the deal. Further, the better outperforms the worse, and the average performs close to the benchmark. On average a mutual fund manager will perform close to the benchmark on average.

This leads us to conclude that the previous research has not addressed the relevant question, as they ask how the average ESG investment performs. Instead, one



should ask: “Can ESG criteria enhance returns on investment processes if implemented sophisticatedly?” (Hoepner, 2013). Indeed, the previous research discussed do not provide a conclusion if sophisticated ESG asset managers can outperform the market or not (Bauer et al., 2005, Bello, 2005).

## 4.0 Theory

Investors seek to maximize the expected return of their portfolios and to do so they are facing mainly two financial constraints, namely risks and liquidity (Koellner et al, 2005). Most asset pricing models, such as Capital Asset Pricing Model (CAPM) advocates a positive relationship between risk and return. Thus, investors need to consider how much risk they are willing to take on in order to get higher expected return.

### 4.1 Mutual Funds

A mutual fund is a portfolio made up of funds collected from several investors for the purpose of investing in securities such as stocks and bonds. The idea is that private investors might receive higher returns if they invest in mutual funds, since they are professional managed. Additionally, a mutual fund helps investors to obtain a diversified portfolio, that is, the weight of each security is low enough such that unsystematic risk will be diversified away. Mutual fund managers base their investment strategies on research and analysis to pick under-or overpriced securities. Using a ESG criteria is per definition classified as active management.

### 4.2 Active versus Passive Management

For active management to be profitable, the mutual fund managers' estimates on companies' performances must be better than everyone else's estimates, while the classical passive management strategy is to buy and hold a well-diversified portfolio that tracks a particular index, such as OSBEX or S&P500. Many acknowledged factor models use a value-weighted proxy such as the S&P500 or OBEX for the market portfolio (i.e. the passive strategy), but a disadvantage of using this in our research question is that the mutual funds is not value-weighted. Historically, the smaller companies tend to outperform the larger ones, implying that mutual funds including smaller companies will outperform the larger ones. The problem with a value-weighted benchmark therefore leads us to use of factor models including the difference in return between small companies versus larger companies (SMB). Another anomaly of the CAPM is the tendency for growth-stocks to outperform, leading us to a model that incorporates these anomalies.

### 4.3 The Four-factor Model

This thesis will explore whether:

*An investor can use the ESG rating to enhance return*

*An investor can use the ESG rating to reduce risk*

In order to formally test our hypotheses, we will use the four-factor model outlined by Carhart (1997).

$$R_i - R_f = \alpha_i + \beta_{mkt,i}(R_i - R_f) + \beta_{SMB,i}(SMB) + \beta_{HML,i}(HML) + \beta_{1YRM,i}(1YRM) + \varepsilon_i$$

The four factors of the model are excess return on market benchmark (mkt), difference between returns from smaller companies versus bigger companies (SMB), difference between returns from high book-to-market companies versus low book-to-market companies (HML), as well as a factor for one-year momentum in returns (1YRM). This momentum parameter will effectively reduce the average pricing error imposed by other models.

Carhart (1997) concluded that this model, in addition to expenses and transaction cost, explains the differences in return between active- and passive management. For a private investor, it therefore means that excess return will be driven to zero if one accounts for the costs involved. Berk and Green (2004) reached the same conclusion and additionally concluded by research that past good performance does not necessarily lead to good future performance. The mechanism behind these results is driven by the fact that private investors place their money at the mutual fund that has had good performance in the past, and there is decreasing returns to scale of the mutual fund.

## 5.0 Methodology

By using the four-factor equation below, we use a linear regression to address our key question:

$$R_{i,t} - R_{f_t} - fee = \alpha_i + \beta_{mkt,i}(R_{i,t} - R_{f_t}) + \beta_{SMB,i}(SMB_{i,t}) + \beta_{HML,i}(HML_{i,t}) + \beta_{1YRM,i}(1YRM_{i,t}) + \beta_{sustainability\ score,i}(sustainability\ score_{i,t}) + \varepsilon_{i,t}$$

This equation is similar as the theoretical one above, except for two elements. Firstly, we have added the sustainability score, where the estimated beta will determine whether the first hypothesis holds. Secondly, we have added a subtraction of fees in order to find the excess return that is comparable. By using panel data, we are able to find more stable estimates since it uses data over time. Our time-period is restricted to March 2016 to March 2017 since the sustainability score is reported from this time on.

We have chosen to focus on mutual funds that have no missing data. As 50% of the mutual funds companies must be covered by Sustainalytics to be in this class, it limits our data to 107 equity Norwegian mutual funds.

The second hypothesis of risk is dealt with by calculating the total risk of each mutual fund, based on the same regression. As the answer to our hypotheses is prone to the definitions Morningstar use, these are explained below. For further details, and source of information, we refer to Morningstar Categories (2016) and Morningstar Sustainability Rating (2016).

## 5.1 Definitions

### 5.1.1 Morningstar Categories

By Morningstar Categories, mutual funds with similar investment strategies are easily accessible. This is important for the key question since mutual funds consisting of different securities cannot be compared. For example, a mutual fund consisting of equities is more likely to yield more return than the mutual fund consisting of bonds. The reason for this is related to the equity premium puzzle,

that is, stocks have historically yielded more return than bonds. By using the Morningstar Categories, we are therefore able to select all-equity mutual funds when collecting data.

### **5.1.2 Morningstar Sustainability Rating**

The Morningstar Sustainability Rating is computed as the sum between portfolio ESG score and portfolio controversy score. The ESG score is a score from 1 to 100 on company level provided by Sustainalytics. The scores are depending on the sector the company operates in, and is normalized and weighted before implemented into the mutual fund's ESG score. The controversy score is an ESG incident that has been subject to a company. This can take a value between 0 (low impact) and 5 (large impact) for each company, and is also measured by Sustainalytics. The mutual funds controversy score is also here weighting of the different companies' scores. A difference from the ESG computation is that controversy scores is not normalized.

### **5.1.3 Fees**

To be able to compare the different mutual funds, subtracting fees are important to find the excess return. A mutual fund can include different kinds of fees, but this thesis will focus on the total number of fees for each mutual fund.

### **5.1.4 Market Portfolio**

The mutual funds are Norwegian, and therefore it is reasonable to use a Norwegian index. Two common proxies are OSEBX and OSEFX, which consist of all stock and mutual funds respectively. Our choice is OSEBX, due to fact that it is the most frequently traded index in the specific time period. This index is adjusted for dividend payouts, and there are several financial institutions and players that use OSEBX as a benchmark (Morningstar, 2004). By Norwegian law, domestic equity funds are required to invest in at least 16 different securities, but in practice this number is usually much higher.

### **5.1.5 Risk-free Rate**

A common proxy for the risk-free rate is a government bond, but the Norwegian government bonds are less liquid than i.e. the American ones. Therefore, we believe the Norwegian Interbank Offered Rate (NIBOR) will serve better as a proxy. The NIBOR rate is the rate used when a Norwegian bank borrows money

from another domestic bank, and is published with different maturities. After considering the trade-off between the short-term fluctuations and long-term stability, we believe that a 3-month NIBOR rate would be the most effective. The 3-month NIBOR is known to be widely used as a reference in the professional market. (Oslo Børs, 2013)

### **5.1.6 Small Minus Big**

To find the mutual fund size, we use the number that is reported on this by each fund company to Morningstar. This number is mostly reported on a monthly basis.

### **5.1.7 High Minus Low**

To find the high minus low value factor, we use the number that is reported on this by each fund company to Morningstar.

### **5.1.8 1 Year Momentum**

To find the mutual fund momentum effect, we use the number that is reported on this by each fund company to Morningstar.

## 6.0 Bibliography

- Bauer, R., Koedijk, K., & Otten, R. (2005). International evidence on ethical mutual fund performance and investment style. *Journal of Banking & Finance*, 29(7), 1751-1767.
- Bauer, R., Derwall, J & Hann, D. (2009). Employee Relations and Credit Risk. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1483112](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1483112)
- Bauer, R. & Hann, D. (2010). Corporate Environmental Management and Credit Risk. Retrieved from [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1660470](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1660470)
- Bello, Z. Y. (2005). Socially responsible investing and portfolio diversification. *Journal of Financial Research*, 28(1), 41-57.
- Berk, J. B., Green, R. C., & Naik, V. (2004). Valuation and return dynamics of new ventures. *Review of Financial Studies*, 17(1), 1-35.
- Carhart, M. M. (1997). On persistence in mutual fund performance. *The Journal of finance*, 52(1), 57-82.
- 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, DOI: 10.1080/20430795.2015.1118917
- Hoepner, G.F. (2013). Global Financial Institute. Retrieved from [https://www.db.com/cr/en/docs/Whitepaper\\_ESG\\_422.pdf](https://www.db.com/cr/en/docs/Whitepaper_ESG_422.pdf)
- Hong H. & Kacperczyk M. (2009). The price of sin: the effects of social norms on markets. *Journal of Financial Economics*, 93 (1) 15–36. doi: 10.1016/j.jfineco.2008.09.001
- Koellner, T., Weber, O., Fenchel, M., & Scholz, R. (2005). Principles for sustainability rating of investment funds. *Business Strategy and the Environment*, 14(1), 54-70.
- Lee, D. D. & Faff, R. W. (2009). Corporate Sustainability Performance and Idiosyncratic Risk: A Global Perspective. *The Financial Review*, 44, 213-237.
- Lee, D. D. & Faff, R. W. (2009). Corporate Sustainability Performance and Idiosyncratic Risk: A Global Perspective. *The Financial Review*, 44, 213-237.
- Lobe, S. & Walkshäusl, C. (2011). Vice vs. Virtue Investing Around the World. Retrieved from <http://link.springer.com/article/10.1007/s11846-014-0147-3>. Doi: 10.1007/s11846-014-0147-3
- Lobe, S. & Walkshäusl, C. (2011). Vice vs. Virtue Investing Around the World. Retrieved from <http://link.springer.com/article/10.1007/s11846-014-0147-3>. Doi: 10.1007/s11846-014-0147-3
- Morgan Stanley. (2016). Morgan Stanley and Bloomberg Survey Finds Sustainable Investing Has Entered the Mainstream. Retrieved from <http://www.morganstanley.com/press-releases/morgan-stanley-and-bloomberg-survey-finds-sustainable-investing->
- Morningstar (2004). Forsatt positive utvikling. Retrived from <http://www.morningstar.no/no/news/85201/fortsatt-positiv-utvikling.aspx>
- Morningstar. (2014). Morningstar Categories Classifications. Retrieved from [http://corporate.morningstar.com/us/documents/MethodologyDocuments/MethodologyPapers/MorningstarCategory\\_Classifications.pdf](http://corporate.morningstar.com/us/documents/MethodologyDocuments/MethodologyPapers/MorningstarCategory_Classifications.pdf)
- Morningstar. (2016). Morningstar Sustainability Rating. Retrieved from <https://corporate1.morningstar.com/Morningstar-Sustainability-Rating-Methodology-2/>

- Oslo Børs. (2013) From today, Oslo Børs will calculate NIBOR rates for Finance Norway. Retrieved from [http://www.oslobors.no/ob\\_eng/Oslo-Boers/About-Oslo-Boers/News-from-Oslo-Boers/From-today-Oslo-Boers-will-calculate-NIBOR-rates-for-Finance-Norway](http://www.oslobors.no/ob_eng/Oslo-Boers/About-Oslo-Boers/News-from-Oslo-Boers/From-today-Oslo-Boers-will-calculate-NIBOR-rates-for-Finance-Norway)
- Revelli, C. and Viviani, J. (2015). Financial Performance of Socially Responsible Investing (SRI): What Have We Learned? A Meta-Analysis. (2015). *Business Ethics: A European Review*, 158-185. 24(2), 158-185. Retrieved from: <https://ssrn.com/abstract=2577035>
- RobecoSAM and Robeco. (2016). Country Sustainability Ranking. Retrieved from <http://www.robecosam.com/en/sustainability-insights/about-sustainability/country-sustainability-ranking/>
- United Nations Environment Program Finance Initiative and Mercer Investment Consulting. (2007). Demystifying responsible investment performance. New York: United Nations Environment Program Finance Initiative and Mercer Investment Consulting. Retrieved from [http://www.unepfi.org/fileadmin/documents/Demystifying\\_Responsible\\_Investment\\_Performance\\_01.pdf](http://www.unepfi.org/fileadmin/documents/Demystifying_Responsible_Investment_Performance_01.pdf)