

The logo for actiam, featuring the word in a lowercase, sans-serif font. The 'a' is a dark blue color, and the 'i' has a small blue dot above it. The remaining letters are a lighter blue color. The background of the entire page is a photograph of a lush green forest with tall bamboo stalks and dense foliage.

actiam

# Integrating Sustainable Materiality into Investment Decisions

A research paper by Sem de Moel and Merle Rüder

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## Executive Summary

An increasing number of asset owners, investment managers, and service providers are committing themselves to incorporating Environmental, Social and Governance (ESG) issues into investment decisions. Consequently, market exposure to shocks related to ESG issues has made it essential for investors to incorporate sustainability factors in order to optimise risk-adjusted returns. However, literature has been divided as to whether investing in firms with high ESG performance leads to outperformance. One theory that can be attributed to the mixed findings, is the lack of incorporating materiality into the ESG decision making process. That is, selecting firms based on high performance on ESG issues that are of material importance to the industry of the firm. This paper examines the financial performance of firms that score high on material sustainable issues against the market and high/low scoring (im)material firms in Europe. Using monthly firm stock return regressions, this analysis finds that there is significant outperformance of high scoring material firms against the market, and against high scoring immaterial and low scoring material firms. Additionally, a materiality portfolio is constructed that is similar in diversification to one of ACTIAM's active portfolios, to accurately compare the financial performance of material firms against other companies and the market. The active portfolio and subsequent portfolio are all compared to the MSCI Europe Index. The results show that the diversified material portfolio significantly outperforms both the active portfolio and the market, suggesting investments in sustainability issues that are relevant to the industry are value-enhancing. These findings have implications for fund managers who have committed to integrate ESG related issues into their investment decisions.

We especially would like to thank Dirk F. Gerritsen (Assistant Professor for the chair Finance and Financial Markets at the Utrecht University School of Economics) for all the effort he has put in helping Sem and Merle and enable them to come up with this excellent paper.

## Foreword



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*“A society grows great when old people plant trees whose shade they know they shall never sit in “ ~ Greek Proverb*

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It is one’s fiduciary duty to take ESG factors into investment decision making. Whether you like it or not you will be forced to do so for several reasons; for example, as a result of rules and regulations (UNPRI & MSCI, 2016). At the moment, most regulations are pressing on transparency and disclosure. The aim is, that once this is achieved (and greater insight is ensured), there will be more rule based regulation, such as those related to the Paris Agreement where commitments are made to keep the average global increase of temperature well below 2 degrees. One of the most innovative and effective examples is Article 173 of the Energy Transition Law in France. Other countries, like the Netherlands, where the supervisor started with a principle based approach for pension funds, will follow.

Growing demand from society and societal pressure are further influencing investors’ decision making and are responsible for ESG becoming mainstream. Often there is a reference to the millennials who are advocating for more sustainability. While this is true, the support for ESG is becoming more widespread amongst all age categories.

The argument that is most often used for not taking ESG-factors into account, is that it is not the core purpose of the financial markets. More specifically: ESG might lead to inferior returns because they limit the number of potential investments with a potential attractive return (when excluding), or they might generate extra costs because of increased research requirements. It is at this point where I get confused and I’ll explain why:

If I was a CEO of a company (or if I would do research on a company) my first goal is to build a business model that is robust and tenable. The next goal is to optimize my returns and to minimize my dependencies. This means that I will take into account everything that could be a possible threat to my investments, no matter how this is labelled. This has nothing to do with ESG or sustainability as such. It is, in fact, a matter of good governance; looking at things that are material to your business.

It seems so logical, and thus it is incomprehensible why so little companies do so. Research (Khan et al., 2015) has proven that there are vast differences in the characteristics of firms. Their reports highlights that some firms are unable to focus on elements that are highly material to their business, with the reason being that management is incapable of distinguishing between immaterial factors and real problems. The paper finds that there is also a clear link between focusing on high-material factors (they differ per sector or industry group) and financial outperformance. In other words: material ESG-factors as an alpha source.

Since that research was done based on US companies, and the main focus of ACTIAM is Europe, we wanted to know if the same applies to European markets. And it does. Although more research is needed, we think the case is strong enough to integrate the outcomes into our investment- and engagement process. Especially this last instrument is a way of taking responsibility, driving performance without limiting your set of opportunities.

I hope that this paper and outcome will inspire investors, asset owners, and companies to integrate material (ESG-)factors in their way of thinking and in their processes. In the end it does not matter what your motivation is (alpha, clients, society or your internal motivation), we all have to contribute towards a sustainable future.

All the credits for this research-paper goes to Merle Rüder and Sem de Moel. They did an outstanding job working tirelessly researching and producing this paper. With their research and with their personalities they leave their footprint within ACTIAM. I wish them all the best in the bright future that clearly lies ahead of them.

*Dennis van der Putten - Head of ESG Research / Responsible investing ACTIAM*

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## 1. Introduction

Society's increasing awareness and expectations in regard to environmental, social and corporate governance issues, has led to significant changes in business concepts and operations. Increased societal awareness has also influenced investors' behaviour to limit long-term risks. Long-term investors are becoming increasingly concerned about the sustainable actions of the firms they invest in. While faith-based ethical investing can be traced back to the colonial era in the U.S., the concept of Socially Responsible Investing (SRI) first emerged in the US in the late 1960s and has, since then, received increased attention from investors worldwide. SRI has undergone a significant transformation, growing from a religious 'value-based' approach of aligning one's portfolio to one's own beliefs, to a broader concept that reflects a wider range of investment criteria (Derwall, Koedijk, & Ter Horst, 2011; Kinder, 2005). Even more recently, the argumentation of Freeman (1984); Friedman (1962), where the social responsibility of business is to prioritise profit and firm value, has been developed into a value-seeking SRI approach. Emerging in the 1990s, it concentrates on identifying social and environmental issues that are likely to affect financial performance. Business competitiveness and the health of society are in fact intertwined, with society needing business to provide jobs and wealth, while business needs a successful society to create demand and a supportive environment (Porter, 2011). It is the concept of Creating Shared Value that is driving more businesses today, implementing policies that enhance business competitiveness while also advancing social conditions in communities (Porter, 2011). A lack of interdependency between social and business activities, simply means a missed opportunity to innovate, grow and create sustainable impact at scale (Porter, Hills, Pfitzer, Patscheke, & Hawkins, 2011).

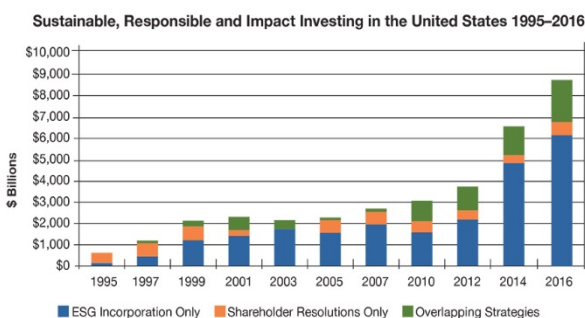
A large majority of asset owners, investment managers, and service providers are signatories of the UN-backed Principles for Responsible Investment (PRI). At present, approximately 1600 signatories, representing more than \$59 trillion assets under management (AuM), are committing themselves to incorporating Environmental, Social and Governance (ESG) issues into investment analysis and decision-making processes and ownership policies and practices.<sup>1</sup> ESG integration, defined by Eurosif (2016) as, "the explicit inclusion by asset managers of ESG risks and opportunities into traditional financial analysis and investment decisions based on a systematic process and appropriate research sources," rose by 35% between 2013 and 2015. In the Netherlands alone, the use of ESG information is increasingly considered an essential part of financial analysis with 94% of pension funds applying at least some ESG criteria in the evaluation of equity investments (Eurosif, 2016). This has concurrently led to the appearance of SRI products on the market such as the MSCI ESG indices, and the Dow Jones Sustainability Index. In addition, there are many data providers available today that provide data points on ESG related issues, such as MSCI and Sustainalytics. This ESG data is becoming integral for investors given its ability to predict financial performance (Kocmanova & Simberova, 2012; Ribando & Bonne, 2010).

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<sup>1</sup> PRI, 2015, "Signatory base AUM hits \$59 trillion", <https://www.unpri.org/page/signatory-base-aum-hits-59-trillion>

Unprecedented growth of responsible investing over the past decade, as shown in figure 1 (US SIF Foundation, 2016), is, amongst others, driven by financial opportunities, the search for stable long-term returns, improved information availability, fiduciary duty, and product availability (Chaudhry et al., 2016; Eurosif, 2016). On another note, markets' exposure to shocks has manifested that integrating environmental, social, and governance (ESG) criteria in investment

Figure 1 - US SIF Foundation, Report on US Sustainable, Responsible and Impact Investing Trends 2016 (2016). Available at <http://www.ussif.org/trends>



SOURCE: US SIF Foundation.

decisions is essential to optimise portfolios' risk-adjusted returns (UNEP, 2010). Mainstream asset managers are likely to under- or overvalue companies' long-term intrinsic value due to a disregard of ESG risks (UNEP, 2010). In particular, some asset managers are warning firms that fossil fuel assets are at risk to be devalued, or rendered stranded, as there are increasing policies introduced to reduce ESG issues such as carbon emissions.<sup>2</sup> However, there still is a large dissent among investors, whether investing in ESG actually pays off. Eccles, Ioannou, and Serafeim (2014) find that prior to the widespread adoption of environmental and social policies, firms that adopt sustainability policies outperform their peers over the long-run, both in terms of stock market and accounting performance. The most common consensus is that funds which invest in socially responsible firms have no significant outperformance against the market, or over conventional funds (Hamilton, Jo, & Statman, 1993; Statman & Glushkov, 2009). There are also studies that find underperformance (Brammer, Brooks, & Pavelin, 2006; Renneboog, Ter Horst, & Zhang, 2008), stating that there is a price to pay for responsible investing. On the other hand, other studies find outperformance (Bollen, 2007; Derwall, Guenster, Bauer, & Koedijk, 2005; Moskowitz, 1972), as integrating ESG issues into investment analysis and decision-making leads to down-side protection whilst concurrently improving upside opportunities (Bos, 2014). To arrive at an aggregated consensus of ESG financial performance, a study by Friede, Busch, & Bassen (2015) analyses more than 2000 empirical studies to be able to generalise findings on the relation between ESG and corporate financial performance. They find that roughly 90% of studies find at least a non-negative relation while the large majority of those studies find positive ESG impact on financial performance over time.

The discrepancies in ESG impact on corporate financial performance can in part be attributed to the 'no net-effect' as explained by Derwall et al. (2011). They argue that there are two hypotheses that can explain SRI performance. The 'shunned stock hypothesis' argues that controversial stocks, due to underinvestment in them, are traded at a discount, whereas the 'errors in expectations' hypothesis reasons that SRI funds have abnormal returns due to stock prices not reflecting CSR practises that are value-relevant (Derwall et al., 2011). This 'no net-effect' could be attributed to investors ignoring the materiality of ESG issues for different firms and that materiality provides an explanation as to

<sup>2</sup> Cripps, P 2015, "BlackRock warns on stranded assets", *Environmental Finance*, 4 November, <https://www.environmental-finance.com/content/news/blackrock-warns-on-stranded-assets.html>

why some SRI funds out- or underperform the market; they select more or less firms that concentrate their investments on material ESG issues. Khan, Serafeim, and Yoon (2015) are the first to suggest that shared value is created when companies focus on sustainability issues that are material for the company.



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*“The most fertile opportunities for creating shared value will be closely related to a company’s particular business, and in areas most important to the business.”*

*~ Porter (2011)*

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Whilst sustainability has received increased awareness by financial market participants and academics, the aspect of integrating materiality into assessing companies’ sustainable performance is a relatively new one. The concept of materiality originally stems from accounting literature and refers to determining the importance of all relevant quantitative financial information (Frishkoff, 1970). Consequently, certain information is regarded as having a greater impact on investors’ decisions relative to other information, due to its differing effect on a company’s financial statements. According to the U.S. Supreme Court, information is material when there is “a substantial likelihood that the disclosure of the omitted fact would have been viewed by the reasonable investor as having significantly altered the ‘total mix’ of information made available.”<sup>3</sup> Applying this to companies’ sustainable performance, the idea of sustainable materiality is based on the assumption that firms which focus more on material sustainability topics are better able to maximise the value of the firm, especially for those with bad CSR practice. By paying attention to sustainability issues that are directly related to the firm’s operations, as well as focusing on improving in those material areas where one performs most poorly, will result in higher corporate social performance as well as a competitive advantage over its peers (Turban & Greening, 1997; Waddock & Graves, 1997). In addition, reporting on material risks for the business is now becoming law, given the significance of these risks for investors.<sup>4</sup> Khan et al. (2015), with the use of MSCI’s KLD corporate responsibility data as well as the Sustainability Accounting Standards Board (SASB) Materiality Map™, identify material issues per industry and subsequently score firms on their material and immaterial performance. They analyse the performance of 2,307 firms over 13,397 unique firm-years and find that companies focusing on material sustainability factors at the disregard of immaterial sustainability factors significantly outperformed companies that: (1) do not focus on material sustainability factors and/or (2) focus on immaterial sustainability factors, or (3) focus very little on material and immaterial sustainability factors, by approximately 6%. Esty and Cort (n.d.) find that the overarching opinion of investors, market analysts, and data providers is that sustainability is not a material factor in determining financial performance. Though, as the authors note, this is due to confusion about the true meaning of sustainability, the lack of clarity about the goals of sustainability-oriented investors,

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<sup>3</sup> TSC Indus. v. Northway, Inc., 426 U.S. 438, 449 (1976)

<sup>4</sup> ClientEarth 2016, “ClientEarth triggers review of companies’ climate disclosures”, 22 August, <http://www.clientearth.org/clientearth-triggers-review-companies-climate-disclosures/>



and the methodological weakness of many ESG metrics used to gauge sustainability. Khan et al. (2015) highlight that this idea is derived due to the disregard of materiality of sustainability issues per industry, and that in fact sustainability-oriented investors are still seeking financial return. In addition, the use of MSCI, a large provider of academic research, ratings, and analysis, in this paper will negate any concerns with regard to methodological weakness of ESG metrics.

This paper aims to extend the research of Khan et al. (2015), and provide further verification on the value-adding properties of material sustainability performance on stock returns, as well as provide asset managers with a practical application to consequently integrate sustainable materiality into investment decision processes. It uses data available for most asset managers and provides a direct comparison of a material portfolio with that of a current active portfolio, to find whether materiality is a relevant factor that has a direct influence on the financial performance of firms. The rest of the paper is structured as follows. Section 2 will present the methodology and data used, section 3 will present the results as well as a discussion on the outcomes, and finally section 4 will provide a conclusion of this paper as well as areas of future research.

## 2. Research & Methodology

This section will discuss the research and methodology of this paper, outlining the step by step process of obtaining materiality scores and consequently testing for outperformance. First, an overview of SASB's Accounting Standards, which form the basis of this research will be given, outlining the classification of firms to different industries, and explaining how the materiality of firms is determined. Next, this section will focus on the data used, in particular the matching process of data with material issues. Then, the research question will be discussed. Afterwards, this section will outline the portfolio construction, estimation and optimisation process as well as identify numerous robustness checks.



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*“SASB standards serve two primary stakeholder groups, through SASB standards, corporations have a cost-effective way to manage and disclose on the sustainability issues that are most germane to their industry. Investors have decision useful-information that they can use to benchmark corporate performance on sustainability issues.”*

*~ Dr. Jean Rogers | Founder and Executive Director | SASB | (Gilman & Schulschenk, 2013)*

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### 2.1 SASB Accounting Standards

Despite the fact that 92% of the world's largest companies report on their sustainability performance<sup>5</sup>, companies struggle with increasing, more complex shareholders' demand for non-financial disclosure. This is primarily due to a lack of guidance on how to undertake integrated reporting, even though integrated reporting is central to understanding how material ESG issues create value for the firm (Serafeim, 2015). In the aim of guiding company disclosure and investor's assessment of sustainability data, the non-profit organisation *Sustainable Accounting Standards Board's (SASB)* has developed sector-specific sustainability accounting standards (Gilman & Schulschenk, 2013). SASB's sustainability accounting standards for 10 sectors and 79 unique industries are in line with mandatory SEC filings and intend to help companies disclose *material and decision-useful* information to investors (Bertocci, Kinstlick, & Underriner, 2016). SASB's framework allows large-scale trends to be quantifiable for each industry by identifying an issue's industry-specific impact.<sup>6</sup> Identified issues are likely to impact companies' financial condition and operational performance in a different manner depending on the specific industry (SASB, n.d.).

A sustainable issue's material importance is determined by SASB using three different components: evidence of interest, financial impact, and forward impact. For each issue, these components assess the interest from industry working groups, the evidence of any financial impact on revenues/costs,

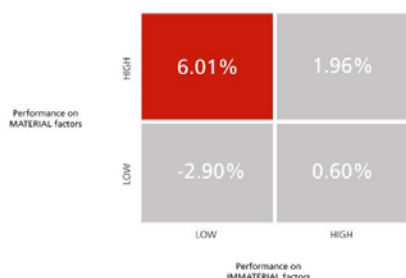
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<sup>5</sup> GRI, n.d., “GRI and Sustainability Reporting”, <https://www.globalreporting.org/information/sustainability-reporting/Pages/gri-standards.aspx>

<sup>6</sup> SASB, n.d., “For Investors: Why SASB”, <http://using.sasb.org/index/for-investors/>

assets/liabilities, or cost of capital, as well as assess the future probability and magnitude of a financial impact.<sup>7</sup> With the creation of its Materiality Map™ (appendix 1), SASB identifies these issues on an industry-by-industry basis, and consequently allow for integrated reporting that is comparable across industries.<sup>8</sup> This matrix can also be used as a playbook for engagement. This is particularly important considering that the largest number of shareholder resolutions are now concerned with social and environmental issues (Serafeim, 2016). Research has found that when investors raise ESG issues in shareholder proposals, the performance on that ESG issue for each firm generally increases, irrespective of whether the issue is material or immaterial. However, immaterial proposals subsequently experienced a decline in market valuation, whereas material proposals experienced an increase in market valuation (Serafeim, 2016).

Figure 2 - Khan et al. (2015) "Stock Returns (annualised alpha) by Type of Sustainability Performance"<sup>9</sup>



For this analysis, the paper looks at the benefits materiality brings to financial performance. As can be seen in figure 2 (Khan et al., 2015), those firms who score well on industry specific material issues outperform those who focus on immaterial material issues, very little on material issues, or very little on material and immaterial issues.<sup>9</sup> Firms used in the sample of this paper, will have their materiality determined by SASB's Materiality Map™.

In order to do so, each firm needs to be linked with a corresponding SICs industry classification as used by SASB. Developed by SASB, the Sustainable Industry Classification System (SICS) groups firms together based on a sustainability perspective. As such, SICS differentiates between 10 sectors and 79 unique industries. By using SASB classifications, investors are better able to understand the impacts of sustainability risks on particular industries and see where they are under- or overexposed. This is particularly important as up to 80% of a company's market valuation is determined by intangibles, including sustainable criteria.<sup>10</sup> In contrast, the classification used by MSCI and S&P, GICS, classifies companies in 11 sectors, 24 industry groups, 68 industries, and 157 sub-industries.<sup>11</sup> In this sample, each firm is manually looked up on the SICS database to determine their SICs industry classification.

Appendix 1 illustrates which sustainability factors are of material importance to each of the 10 sectors [key performance indicators (KPIs) are environment, social and human capital, business model & innovation, and leadership & governance] in terms of financial impact and opportunities for innovation. For example, Greenhouse Gas (GHG) Emissions are regarded as a material factor for companies operating in the Non-Renewable Resources and Transportation sectors, whilst GHG Scope 1 emissions are not of material importance for financial companies. Instead, systemic risk

<sup>7</sup> SASB, n.d., "Materiality: Why is it important?", <https://www.sasb.org/materiality/important/>

<sup>8</sup> SASB, n.d., "Innovation Behind the Scenes: SICS". <https://www.sasb.org/innovation-scenes-sics/>

<sup>9</sup> SASB, n.d., "For Investors: Why SASB", <http://using.sasb.org/index/for-investors/>

<sup>10</sup> SASB, n.d., "Innovation Behind the Scenes: SICS". <https://www.sasb.org/innovation-scenes-sics/>

<sup>11</sup> MSCI 2017, "GICS", <https://www.msci.com/gics>

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management, business ethics, and transparency should be regarded as materially important when evaluating the majority of financial companies. Because identified issues are likely to impact companies' financial condition and operational performance in a *different* manner depending on the specific industry (SASB, n.d.), in-depth industry research has identified industry-specific accounting metrics that can be used to quantify each material sustainability factor (Gilman & Schulschenk, 2013). Lifecycle impacts of products and services, for example, is of material importance for both, the health care and financial sector, but measured differently. Pharmaceutical companies are screened for take-back and/or safe permanent disposals of unused products at the end of its lifecycle, whereas commercial banks are screened for their ESG integration process and total loans granted to companies operating in the non-renewable resources sector. The data collection and subsequent portfolio formation is conducted in guidance of SASB's Materiality Map™.

## *2.2 Sustainability Data Collection and Matching Process*

In the search of optimised active management strategies, an active portfolio and its respective benchmark (MSCI Europe) are used in the remainder of the study. Industry-specific issues, as identified by SASB, are respectively matched with data received from MSCI ESG Research. MSCI ESG Research provides academic research, ratings, and analysis to institutional and financial companies (MSCI ESG Research, 2017). It measures the environmental, social, and governance performance of companies worldwide and allows asset owners to identify ESG related risks and opportunities of the respective portfolio. In conjunction with other services, MSCI identifies key issues for each industry, assesses company performance on applicable key issues, and monitors ESG controversies and violations of global norms (MSCI ESG Research, 2017). These key issues are weighted based on MSCI's materiality mapping framework, which as section 3.5 will demonstrate, weights the materiality of key industry issues differently than SASB.

Guidance is taken from SASB's accounting standards to (a) identify industry-level material issues and (b) match companies in the universe to one of the 79 identified industries. Industry-specific accounting metrics, as identified by SASB, are then matched with MSCI sustainability factors. Data is retrieved for 448 European companies and, amongst others, includes data points that are characterised as total scores, exposure scores, management scores, percentages of sales revenue [e.g., "the recent-year percentage of revenue (...) a company has derived from products, services, infrastructure, or technologies that proactively address"<sup>12</sup> certain issues; namely energy efficiency and clean sources of energy], controversies, and dummy scores (e.g., weapon involvement). To account for differences in accounting metrics between industries, company data on 74 unique sustainability factors is retrieved from MSCI. For example, as mentioned earlier, the SASB issue of lifecycle impacts of products and services, for pharmaceutical companies, relates to the safe permanent disposals of unused products at the end of its lifecycle. Accordingly, the MSCI data point

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<sup>12</sup> MSCI ESG Database 2017

“Chemical Safety” is matched to this SASB issue for the pharmaceutical industry. More information about material topics per industry can be retrieved from SASB’s Materiality Map™ online.<sup>13</sup>

Company *i*’s ESG data is matched with its respective industry’s material issues, enabling a company-level assessment on material and immaterial performance. Prior to assigning final scores to company *i*’s material and immaterial performance, data points are standardised from 0 - 10 (best performance). All of company *i*’s material/immaterial scores are subsequently summed up and weighted according to the respective industry’s number of material/immaterial sustainable issues to obtain a final (im)material ESG score that is fully comparable across all industries.

$$\text{Material Score}_{it} = \frac{\sum \text{Score on material issue}_{it}}{\text{No. of industry-specific material issues}} \quad (1)$$

$$\text{Immaterial Score}_{it} = \frac{\sum \text{Score on immaterial issue}_{it}}{\text{No. of industry-specific immaterial issues}} \quad (2)$$

The final Materiality ESG Score is weighted, due to large fluctuations in the amount of material sustainability issues across different industries. Appendix 3 lists the number of material and immaterial indicators *per industry*. The Food Retailers & Distributors, Biotechnology, and Pharmaceutical industries have the most classified material issues with 15, 12, and 12 issues respectively. When comparing material issues on a sector level, it becomes apparent that industries within a sector have similar material topics. However, small deviations in the number and type of material topics remain. In some cases these differences are vast. In the Consumption sector, for example, the number of industry-specific material issues ranges between 2 and 15. Consequently, standardising company scores relative to the industry’s number of material indicators becomes essential.

### 2.3 Research Question

Based on previous literature, this research aims to find an answer to the following two questions.

1. Do firms, which score high on materiality, outperform low-scoring material firms and high-scoring immaterial firms in Europe?

This question is an extension of the research performed by Khan et al. (2015), who found that firms with strong performance on material topics outperform firms with poor performance on material topics in the US. However, thus far, no research has looked at the European market. In addition, this research aims to use industry excess returns to counteract a potential overrepresentation of certain industries in the material and immaterial portfolios.

2. Keeping diversification constant, can a material portfolio constructed based only on materiality, outperform an active portfolio and the market?

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<sup>13</sup> SASB 2016, “SASB Materiality Map™”, <http://materiality.sasb.org/>

Thus far, research has only focused on top material performance against the market. However, the firms in the material portfolio that is used, are not an accurate reflection of a typical portfolio composition of a managed fund; they lack diversification. As a result, a material portfolio is constructed, based on the highest scoring material firms, for each industry that is represented in an ACTIAM actively managed fund. Consequently, the constructed portfolio is measured against the actively managed portfolio and its benchmark.

#### 2.4 Portfolio Construction

To test the impact of materiality on companies' financial performance, the paper considers the following portfolio constructions:

*Table 1 - The portfolio composition of the index and portfolios. The MSCI Europe Index and the Active Portfolio have stocks weighted according to the actual weighting used by MSCI and ACTIAM. Materiality portfolios' firms are assigned equal weighting*

	MSCI Europe Index	Active portfolio	High Materiality	Low Materiality	High Immateriality	Low Immateriality
No. of Companies	446	100	100	100	100	100
Nature of Portfolio	Index weight	Current weight at 30-06-16	Equally weighted	Equally weighted	Equally weighted	Equally weighted

The current active weightings of each stock in the MSCI Europe Index and the actively managed portfolio are taken, whereas equal weighting is used when constructing portfolios of the hundred best and worst performing companies in regard to (weighted) materiality and immateriality performance.<sup>14</sup> Companies excluded by ACTIAM as of September 2016, due to non-compliance to ACTIAM's Fundamental Investment Principles, are included in the MSCI Europe Index, but neglected in the subsequent portfolio constructions. This is done in order for the created portfolios to be as similar as possible to the active portfolio when comparing their results. The firms in the sample, range in the material score from 9,33 to 0,01, while in the immaterial score, these same firms range from 6,28 to 2,82. For the high material portfolio, the 100 highest scoring firms are taken ranging from a score of 9,33 to 6,18. In comparison, the 100 high-scoring immaterial firms range in material score from 9,14 to 1,72, while the active portfolio ranges from 9,33 to 1,80.

##### 2.4.1 Return Estimation

The time period from November 2011 to October 2016 is used, and monthly price data is obtained from the FactSet database. To account for certain industries being leaders in materiality, and as a consequence skewing the financial performance of the portfolios into the general performance of the industry itself, excess industry returns are used. Excess industry returns are calculated by obtaining

<sup>14</sup> Companies' material and immaterial performance is weighted according to the germane industry's number of material/immaterial issues. The top and bottom 100 ranked companies on material and immaterial performance are grouped into four respective portfolios.

a firm's monthly returns and subtracting the industry average return of the industry it finds itself in. Industry average returns are determined by taking the average return of all firms in that industry. The monthly financial performance between November 2011 to October 2016 for all four material/immaterial portfolios is estimated using the Carhart (1997) Four-factor model, where the MSCI Europe Index is the market proxy in all estimations. The Carhart (1997) model is preferred over the traditional Capital Asset Pricing Model (CAPM) given that it includes factors that control for market-wide risk. These include whether a portfolio tilts towards small or big companies (Small Minus Big, SMB), whether it tilts towards value or growth stocks (High Minus Low, HML), or whether the portfolio tilts towards stocks that have momentum (Winners Minus Losers, WML) and the relation these factors have to the portfolio's return (Fama & French, 2015). Factor data is obtained from the French Data Library<sup>15</sup> on a monthly basis and is based on stocks listed in all the major markets in Europe. The Carhart (1997) Four Factor model is used as follows:

$$R_i = r_i - r_F = \alpha + \beta_1(r_M - r_F) + \beta_2(\text{SMB}) + \beta_3(\text{HML}) + \beta_4(\text{WML}) + \epsilon_{it}$$

Where

- $\alpha$  = Intercept of the regression line
- $r_i$  = Return on asset i
- $r_F$  = Risk-free interest rate in government bonds
- $r_M$  = Return of the market portfolio
- SMB = Return of the size factor
- HML = Return of the value factor
- WML = Return of the momentum factor
- $\epsilon_{it}$  = residuals of the regression model

To ensure robustness, regression analysis on the financial performance of the portfolios is also estimated using the Fama and French (1993) Three Factor regression model. Like the Carhart (1997) model, it adds additional factors to the regression, however it does not focus on the momentum of stock. The Three Factor regression model is as follows:

$$R_i = r_i - r_F = \alpha + \beta_1(r_M - r_F) + \beta_2(\text{SMB}) + \beta_3(\text{HML}) + \epsilon_{it}$$

In contrast to the Carhart Four Factor and Fama French Three Factor regression models, the risk-free interest rate of government bonds is not subtracted from the return on asset i. Instead, as mentioned above, a company's return relative to its industry - 'excess industry return' - is used. In other words,  $R_F$  represents the average industry return.

#### 2.4.2 Portfolio Optimisation

In addition to the abovementioned portfolio constructions, three supplementary portfolios are created to further test the effect of sustainable materiality on financial performance and consequently optimise portfolio construction decisions. While the high materiality portfolio takes materiality into account, it lacks the amount of industry diversification that a regular actively

<sup>15</sup> French, K 2017, "Current Research Returns", [http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)  
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managed portfolio has. The three supplementary portfolios, Test 1, Test 2, and Test 3, are consequently based on the active portfolio used in this study to better represent the performance of materiality in a real-life situation. The objective is, when possible, to substitute current holdings with better performing companies with regard to their sustainable materiality performance, whilst holding the portfolio's industry diversification and weighting constant. The portfolio's diversification and weighting per industry and within an industry remain constant to allow a cross-portfolio performance comparison. In addition, financial performance is neglected in the substitution and selection of companies. Financial performance of supplementary portfolios is only analysed post portfolio construction.

The three portfolios differ in their nature of substitution. When constructing the adjusted portfolio Test 1, substitution occurs on a SIC5 industry-level, ensuring no change in industry representative germane to the active portfolio. Due to a limitation of companies included in the sample, and thus there being limited substitution prospects, industry-level substitution is not always feasible. Thereupon, for portfolio Test 2, the choice is made to substitute holdings on an industry level, when there are a minimum of 10 substitute prospects. Else, substitution occurs on a SIC5 sector-level. With regard to Test 3, substitution is executed on a sector-level only to further account for limited substitution opportunities in the universe.

Upon further consideration of the 'shunned stock hypothesis,' as explained by Derwall et al. (2011), companies with any relations to alcohol, gambling, tobacco, and/or weapons, are excluded from the investment universe. Such companies are referred to as 'sin-stocks'. Hong and Kacperczyk (2009) reason that those sin-stocks are shunned by norm-constrained investors resulting in an undervaluation, and thus achieving higher expected returns. Excluding 'sin-stocks' is merely a robustness check for the optimised portfolio. The MSCI Europe Index and the active portfolio are not adjusted for the 'shunned stock hypothesis. Through the exclusion of sin-stocks in this analysis, this robustness check is able to pinpoint any outperformance towards the effect of materiality, and not the effect of investing in sin-stocks.

As a final analysis, the average, weighted material ESG scores of each portfolio are determined. These are calculated by summing up the ESG scores of each firm multiplied by the weighting of that firm in the portfolio.

$$\text{Portfolio}_j \text{ Material ESG Score} = \sum (\text{Material Score Firm}_i \times \text{Weighting Firm}_i)$$

In addition, MSCI's Weighted-Average Key Issue Scores are obtained for each firm and the portfolio weighted average is determined in the same way as the material score. The MSCI Score represents the weighted average of the scores received on all the key issues contributing to the final rating of



the company.<sup>16</sup> MSCI's ESG rating identify these issues for firms on a sub-industry level based on the social and environmental externalities that industry is currently facing, and the unanticipated costs associated with these externalities (MSCI ESG Research, 2015). Estimated portfolio outperformance, market beta, and the material and MSCI scores are compared for each of the three portfolios as well as the active portfolio. This will give a first insight as to the link between changing material and MSCI scores and financial performance. The results are displayed and discussed in the subsequent chapter.

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<sup>16</sup> MSCI ESG Database 2017  
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### 3. Results & Discussion

The following section discusses the results for the different methodologies outlined above. First, this section will look at the performance of the material portfolio in comparison to the immaterial portfolio and the low material portfolio. Next, this section will focus on the performance of the material portfolio against the active portfolio and the market. Finally, this section analyses the performance of the three supplementary portfolios against the active portfolio and the market and the outcomes of the robustness checks.

#### 3.1 Materiality versus Immateriality

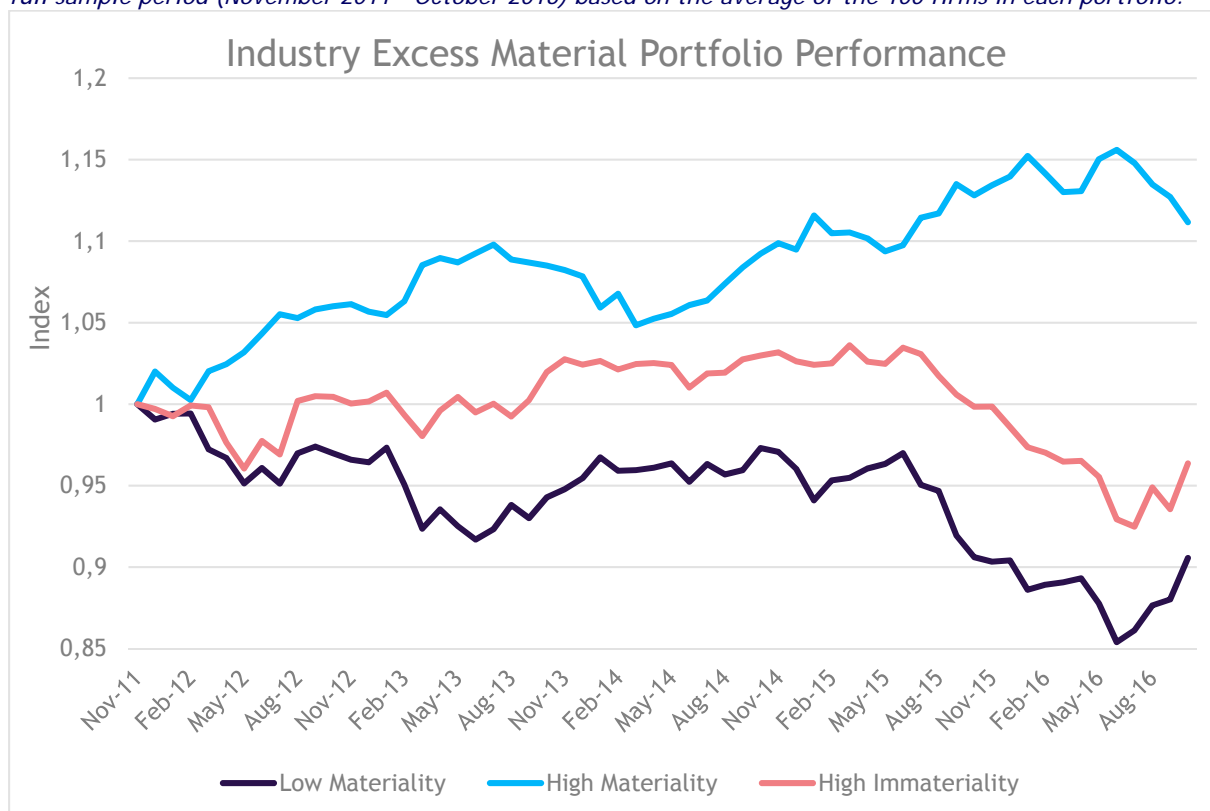
Table 2, lists the results of the regression analysis of the high material, low material, and high immaterial portfolio against the MSCI EU Market Index. Figure 3, shows a representation of the industry excess accumulated returns over the five-year period, between 2011 and 2016.

*Table 2 - Outlines Carhart (1997) Four Factor analysis for material and immaterial sustainable firms. It demonstrates high material, high immaterial, and low immaterial sustainability performance against the MSCI Europe Market Index. The alphas are monthly. Significance levels are denoted by \*, \*\*, and \*\*\* for 10%, 5%, and 1% respectively. Values in brackets indicate p-values.*

Material Portfolio Performance against the MSCI EU Index			
	High Material Performance	High Immaterial Performance	Low Material Performance
Parameter	Estimate <sup>17</sup>	Estimate <sup>17</sup>	Estimate <sup>17</sup>
Intercept	0,0021** (0,0486)	0,0001 (0,9609)	-0,0012 (0,3357)
MSCI EU Index	0,2305 (0,1719)	-0,2376 (0,2076)	-0.2431 (0,2210)
SMB	-0,0016** (0,0216)	-0,0018** (0,0234)	0.0002 (0,8235)
HML	-0,0020*** (0,0001)	0,0030*** (0,0000)	0.0030*** (0,0000)
WML	0,0004 (0,2786)	-0,0002 (0,6738)	-0,0006 (0,2210)
Adj R-squared	0,4868	0,4983	0,5052

<sup>17</sup> Values in brackets indicate p-values

Figure 3 - Accumulated returns of the materiality portfolios. Industry excess returns are determined by subtracting the relevant industry average return from each firm. Returns are accumulated monthly over the full sample period (November 2011 - October 2016) based on the average of the 100 firms in each portfolio.



### 3.1.1 High material against low material portfolio performance

As can be seen in the graph above, looking at past portfolio performance, the high material portfolio has clearly outperformed the portfolios consisting of the lowest material scoring firms. When looking at industry excess returns, the average returns of the portfolio minus the industry average return for each firm in the portfolio, the high material portfolio is the only portfolio, which positively increases in value, in the period between November 2011 and September 2016. This highlights that firms with a high material ESG score outperform their industry peers, on average, by 2.14% per annum. On the other hand, firms in the low scoring material portfolio experience, on average, show negative returns of -1.96% per annum over the same time period, compared to other firms in the industry. This outcome is a first step in the suggestion of high scoring material firms experiencing financial outperformance over firms with a low material score.

The apparent outperformance of high material firms against industry peers with low scores on sustainability issues is supported when the high and low material portfolios are regressed against the market. The first and third column in table 2 outline the results. Taking the Carhart (1997) four additional factors into consideration, high scoring material firms outperform the market by 21 basis points per month (2,52% per annum), significant at the 5% level. Meanwhile, the results show no significant outperformance of low material firms against the market. These findings are in support of Khan et al. (2015) who find that their sample of high scoring material firms also outperform low scoring firms. The results also show that high material firms are more likely to be large firms and growth stocks. This could suggest that firms who have a lot of capital and resources available, are

more capable to invest in sustainability issues. Thus the outperformance of material firms may be caused by the size of the firm. However, as Khan et al. (2015) show in their analysis, material firms still outperform significantly if portfolio allocations are value-weighted.

### *3.1.2 High material against high immaterial portfolio performance*

Similarly to the performance of low material firms, high immaterial firms experience a decrease in value compared to their industry peers, over the period between November 2011 and September 2016, by -0.74% per annum. While this result is an indicator that high immaterial firms perform less well than high material firms, it also shows that high immaterial firms seem to perform better than low scoring material firms. This suggests that for immaterial firms, while spending capital on immaterial sustainability issues will not increase firm value drastically, it is better than not spending on sustainability issues at all.

In line with the findings from section 3.1.1., the results from the estimation of high material performance and high immaterial performance against the market is presented in table 2 in columns 1 and 2. It finds that for high scoring immaterial firms, there too is not any significant outperformance against the market. Likewise, immaterial firms seem to be more value oriented as well as smaller, whereas material firms are more growth oriented and larger. This could be due to some immaterial CSR projects being very cheap to undertake, such as philanthropic donations to charities, and thus are more likely to be used by firms, who are small and do not have much capital yet. However, as the similar results between the outperformance over high immaterial and low material firms show, these CSR projects add little to the firm's value. In addition, high materiality seems to be linked more towards growth stocks, given these firms are more likely to invest in new innovative products that will have an impact on the market in the future; something that is widely expected of sustainability. Overall, the findings that high material firms outperform low scoring material and high scoring immaterial firms, are in support of Derwall et al. (2011) "errors in expectations hypothesis". Materiality is giving sustainability value-adding properties that are incorporated in the future cash flows of the firm.

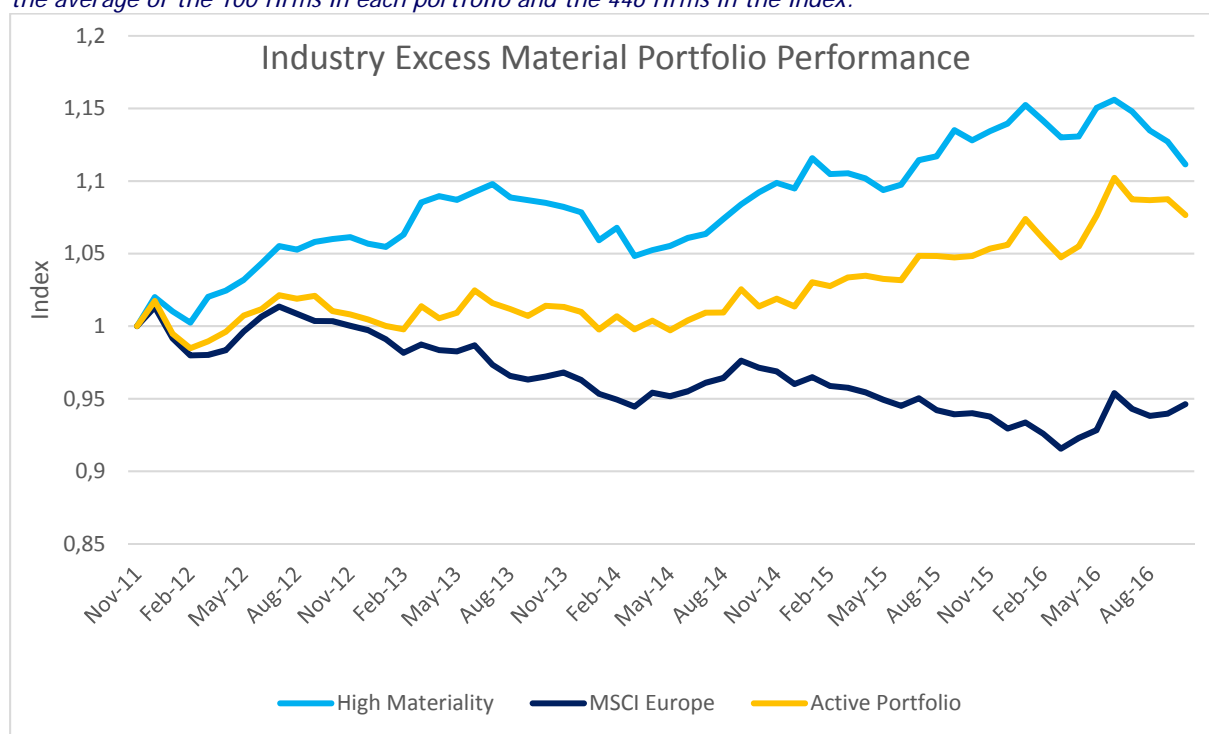
### *3.2 Materiality against the Active Portfolio and the Market*

Table 3 lists the results of the high material portfolio estimated against the market, as well as the active portfolio, managed by ACTIAM, estimated against the market for the period of five years. The MSCI Euro index is used as a market proxy, given that it is the market against which the active portfolio benchmarks itself. Figure 4 represents the accumulated industry excess returns of the portfolios mentioned, for the same time period of 5 years between 2011 and 2016.

Table 3 - Outlines Carhart (1997) Four Factor analysis for material sustainable firms and ACTIAM's active portfolio. It demonstrates high material sustainability performance and the active portfolio's performance against the MSCI Europe Market Index. The alphas are monthly. Significance levels are denoted by \*, \*\*, and \*\*\* for 10%, 5%, and 1% respectively. Values in brackets indicate p-values.

Portfolio Performance against the MSCI EU Index		
	High Material Performance	Active Portfolio Performance
Parameter	Estimate <sup>18</sup>	Estimate <sup>18</sup>
Intercept	0,0021** (0,0486)	0,0018** (0,0234)
MSCI Europe	0,2305 (0,1719)	1,0281*** (0,0000)
SMB	-0,0016** (0,0216)	0,0008 (0,1542)
HML	-0,0020*** (0,0001)	-0,0011*** (0,0045)
WML	0,0004 (0,2786)	0,0001 (0,7198)
Adj R-squared	0,4868	0,6981

Figure 4 - Accumulated returns of the high materiality and active portfolios as well as the MSCI Europe Market Index. Industry excess returns are determined by subtracting the relevant industry average return from each firm. Returns are accumulated monthly over the full sample period (November 2011 - October 2016) based on the average of the 100 firms in each portfolio and the 446 firms in the index.



<sup>18</sup> Values in brackets indicate p-values.

Looking at figure 4, which outlines the industry excess accumulated returns, while the active portfolio already shows a strong improvement on the index, the high material portfolio performs even better. Both the firms in the active portfolio and the high material portfolio increase in value compared its industry peers, on average, by 1,49% and 2,14% per annum respectively. On the other hand, the MSCI Europe Index declines in value by -1,10% per annum, over the period of 5 years. The fact that both the active portfolio and the high material portfolio perform better during this period, could be related to the value-adding properties behind sustainability issues. The active portfolio already invests in accordance with ACTIAM's ESG Policy, and ensures that the portfolio's ESG score, as measured by ACTIAM, is higher than the ESG score of the MSCI Europe index. However, what it does not fully account for is the materiality of ESG issues for firms, as suggested by SASB. This could explain the higher outperformance of the material fund.

The strong performance over the benchmark, for both the active and material portfolio, is justified in table 3. The active portfolio has an estimated outperformance of 18 basis points per month (2,23% per annum), significant at the 5% level. Meanwhile, the material portfolio has an estimated outperformance of 21 basis points per month (2,52% per annum). These outcomes again show support for the "errors in expectations hypothesis" in that sustainability is value-relevant information that is not yet included in stock prices. Additionally, since the material portfolio outperforms the index by a greater amount, this provides evidence for materiality being a better indicator in providing sustainability factors that maximise the value of the firm. As in the earlier analysis, material sustainable firms seem to be more heavily skewed towards growth stocks. This is most likely to be due to material stocks being expected to grow at a greater rate than the market as the unknown value of material sustainability issues become known.

### 3.3 Optimised Portfolio Performance

Table 4 identifies the number of industries represented in the active portfolio, as well as for each of the three optimised portfolios.

*Table 4 - Characteristics of the active and the optimised portfolios, which are adjusted for materiality performance.*

	Active Portfolio	Test 1	Test 2	Test 3
Nature of substitution	-	Industry level	Industry and Sector level	Sector level
No. Of SICS industries	40	40	33	31
No. Of GICS industries	22	23	20	22

Besides differences in the nature of substituting current holdings between Test 1, 2, and 3, the number of industries represented varies amongst optimised portfolios as well. The table above exhibits that the number of GICS industries presented in the adjusted portfolios remains relatively constant, whereas the number of SASB industries presented in the adjusted portfolios declines notably. This is explained by increasing substitution on a SICS sector-level as the portfolio construction process continues from test 1 to 3. GICS industries remain relatively constant however, as it is based on less industries than SICS and focuses on business activity rather than categorising firms that share

similar resource intensity like SICS.<sup>19,20</sup> As a result, all 3 portfolios appear to be comparable portfolios with the benchmark given the similarity in number of GICS industries, the standard most asset managers use today. Table 5 presents the financial performance of the active portfolio, Test 1, 2, and 3 relative to the MSCI Europe benchmark, while figure 5 indicates the accumulated industry excess returns for the aforementioned portfolios.

*Table 5 - Outlines Carhart (1997) Four Factor analysis for the three optimised portfolios and ACTIAM's active portfolio. It demonstrates the optimised portfolios' and the active portfolio's performance against the MSCI Europe Market Index. The alphas are monthly. The robustness check indicates whether alphas are still significant using the Fama and French (1993) Three Factor Model. Significance levels are denoted by \*, \*\*, and \*\*\* for 10%, 5%, and 1% respectively. Values in brackets indicate p-values.*

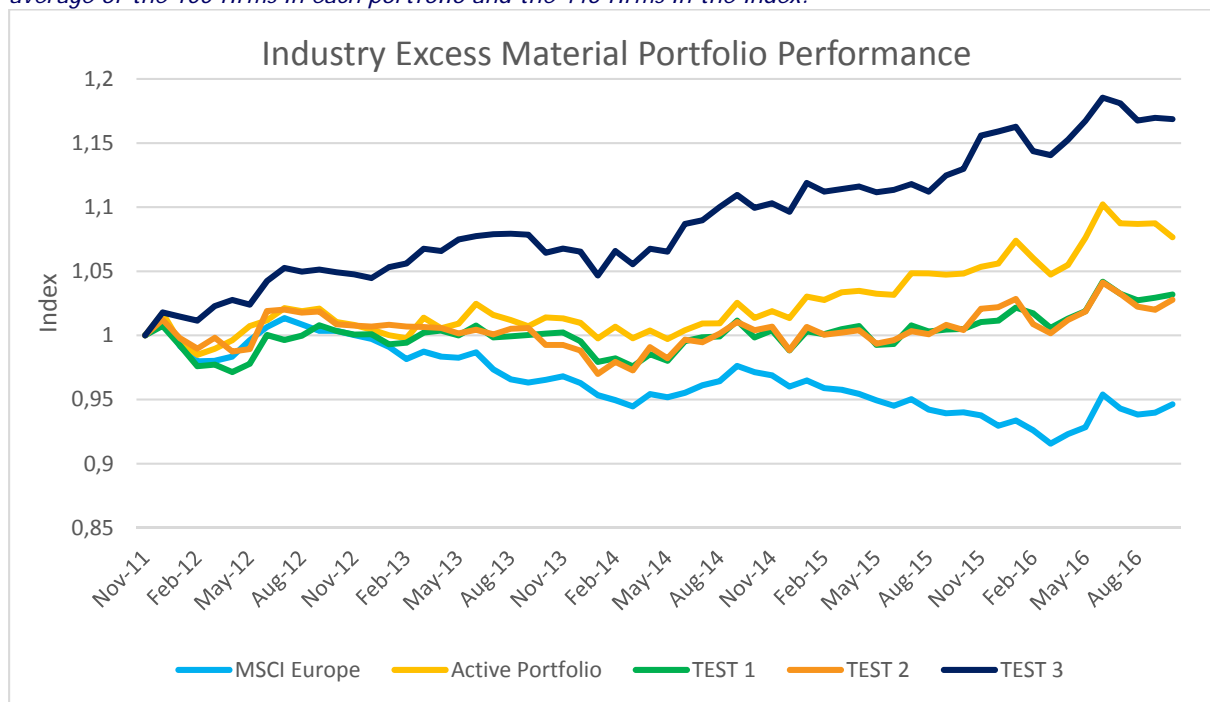
Optimised Portfolio Performance against the MSCI EU Index				
	Active Portfolio Performance	TEST 1 Performance	TEST 2 Performance	TEST 3 Performance
Parameter	Estimate <sup>21</sup>	Estimate <sup>21</sup>	Estimate <sup>21</sup>	Estimate <sup>21</sup>
Intercept	0,0018** (0,0234)	0,0020** (0,0194)	0,0021* (0,0588)	0,0040*** (0,0012)
MSCI Europe	1,0281*** (0,0000)	0,9003*** (0,0000)	0,7750*** (0,0000)	0,5181*** (0,0079)
SMB	0,0008 (0,1542)	-0,0002 (0,6750)	-0,0009 (0,2230)	-0,0010 (0,2056)
HML	-0,0011*** (0,0045)	-0,0003 (0,4036)	-0,0005 (0,2785)	-0,0014** (0,0141)
WML	0,0001 (0,7198)	-0,0006* (0,0825)	-0,0006 (0,1273)	-0,0004 (0,3858)
Adj R-squared	0,6981	0,5807	0,4326	0,3254
Sharpe Ratio	0,7432	0,6800	0,6397	0,8415
Robustness - Fama-French		NO	NO	YES

<sup>19</sup> SASB 2017, "Sustainable Industry Classification System™", <https://www.sasb.org/sics/>

<sup>20</sup> MSCI 2017, "GICS", <https://www.msci.com/gics>

<sup>21</sup> Values in brackets indicate p-values

Figure 5 - Accumulated returns of the optimised and active portfolios as well as the MSCI Europe Market Index. Industry excess returns are determined by subtracting the relevant industry average return from each firm. Returns are accumulated monthly over the full sample period (November 2011 - October 2016) based on the average of the 100 firms in each portfolio and the 446 firms in the index.



As can be seen in figure 5, the active portfolio has performed strongly compared to some of the optimised portfolios, having achieved higher industry excess returns over the five-year period than Test 1 and 2. This is in line with the portfolios' respective Sharpe ratios. While the MSCI Europe Index has a Sharpe ratio of 0.55, the active portfolio's Sharpe ratio is 0.74, giving an indication of risk-adjusted outperformance relative to the index. Further, Test 1 and Test 2 do not achieve a higher risk-adjusted return relative to the active portfolio. In regard to Test 3, the portfolio realises a return outperformance of 3,17% per annum, significantly higher than the returns over the same period by the high material portfolio (2,14%), even with it having greater diversification. Test 3's Sharpe ratio of 0.84 further confirms the portfolio's risk-adjusted outperformance.

Table 5 highlights further evidence of the benefits of optimising a portfolio to high materiality standards. Though, as mentioned earlier, the active portfolio significantly outperforms the benchmark by 18 basis points per month. Outperformance surges as the portfolio optimisation process continues. All else equal, the third optimisation strategy, which is implemented in Test 3, outperforms the benchmark by 40 basis points per month in the same time period, significant at the 1% level. Per annum, Test 3 outperforms the index by 4,87%. In addition, as outperformance increases significantly from the active portfolio to test 1, 2, and 3, market risk concurrently declines. When comparing the active portfolio and the third optimised portfolio (Test 3), one can see that the active portfolio, with a beta of 1,0281, close to perfectly moves in line with market fluctuations. At the same time, Test 3's market risk has declined by half (beta: 0,5181), making the Test 3 portfolio a much better investment. The finding, that materiality-focused portfolios generate abnormal risk-adjusted returns, is in line with Wheelan and Responsible Investor (2008) who state that ESG investing actually improves



the risk and return information, and are more likely to contain well-run, stable firms that outperform the broader market in the long run (Barnett & Salomon, 2006). It further suggests that asset managers, who incorporate companies' material performance into investment decisions can considerably optimise their current portfolio and improve performance and exposure relative to the respective index. All else equal, portfolios adjusted for sustainable materiality yield higher risk-adjusted returns.

### 3.4 Robustness

Robustness checks, as described in Chapter 2.3.1 are performed, by using the Carhart *and* Fama French model in the regression analysis. After estimating the performance of each portfolio using the Fama French model, merely the significance of Test 3 is ensured. Due to data limitations, only 448 unique companies are considered in the study. Consequently, limitations in substitution prospects are likely to have impacted the robustness of portfolio Test 1 and 2.

While material sustainable outperformance has largely been explained through the “errors in expectations hypothesis”, it has not accounted for the effect of the “shunned stock hypothesis”: the newly optimised portfolios are generating outperformance due to a large presence of sin stocks. Subsequently, companies that have any ties to alcohol, gambling, tobacco, and/or weapons are excluded from possible substitution options and therefore the portfolio. Substitution is still based on previously stated assumptions in Chapter 2.3.2.

*Table 6 - Outlines robustness test for Carhart (1997) Four Factor analysis of the Test 3 optimised portfolios and ACTIAM's active portfolio. It demonstrates Test 3's and the active portfolio's performance against the MSCI Europe Market Index. The Sin-Adjusted Test 3 excludes all sin-stocks from the portfolio and replaces them with the highest ranked material non sin-stock. The alphas are monthly. The robustness check indicates whether alphas are still significant using the Fama and French (1993) Three Factor Model. Significance levels are denoted by \*, \*\*, and \*\*\* for 10%, 5%, and 1% respectively. Values in brackets indicate p-values.*

Robust Portfolio Performance against the MSCI EU Index			
	Active Portfolio Performance	TEST 3 Performance	Sin-Adjusted Test 3
Parameter	Estimate <sup>22</sup>	Estimate <sup>22</sup>	Estimate <sup>22</sup>
Intercept	0,0018** (0,0234)	0,0040*** (0,0012)	0,0046*** (0,0000)
MSCI Europe	1,0281*** (0,0000)	0,5181*** (0,0079)	0,5066*** (0,0043)
SMB	0,0008 ( 0,1542)	-0,0010 (0,2056)	-0,0001 (0,8187)
HML	-0,0011*** (0,0045)	-0,0014** (0,0141)	-0,0006 (0,1748)
WML	0,0001 (0,7198)	-0,0004 (0,3858)	-0,0001 (0,6977)

<sup>22</sup> Values in brackets indicate p-values

	Active Portfolio Performance	TEST 3 Performance	Sin-Adjusted Test 3
Parameter	Estimate	Estimate	Estimate
Adj R-squared	0,6981	0,3254	0,2319
Sharpe Ratio	0,7432	0,8415	0,9575
Robustness - Fama-French		YES	YES

The results in table 6 display that the sin-adjusted Test 3 outperforms the index by 45 basis points per month, significant at the 1% level. Per annum, the sin-adjusted Test 3 outperforms the index by 5.63%. By excluding sin-stocks that are said to be trading at a discount and consequently are generating abnormal returns, this paper is able to pinpoint any outperformance towards the effect of materiality, and not the effect of investing in sin stocks. This is verified by surging Sharpe ratios as the portfolio optimisation process continues: excluding sin-stocks leads to a Sharpe ratio of 0.95 for the adjusted Test 3. Investors are often concerned about the significant risk associated with excluding sin-stocks. However, as table 6 shows, excluding these sin-stocks, and thus reducing the total investment universe, actually decreases the market beta to 0,5066, significant at the 1% level.

### 3.5 MSCI Score and Materiality Score: A Link to Outperformance?

*Table 7 - Financial performance and ESG scoring of the active and optimised portfolios.*

Relationship between ESG scores and financial performance				
	Active Portfolio	Test 1	Test 2	Test 3
Market Outperformance	2,23% p.a.	2,41% p.a.	2,52% p.a.	4,87% p.a.
Market Beta	1,028	0,900	0,775	0,518
Materiality Score	5,23	6,26	6,71	7,21
MSCI ESG Score	5,83	5,99	5,87	5,93

Table 7 lists the financial performance and ESG scores of the four differing portfolios, with all returns and betas being significant. This table illustrates that as a portfolio increases its materiality score, the subsequent outperformance over the market increases. At the same time, the market beta decreases to that of nearly half the market risk. This finding has vast implications for asset managers: by increasing the materiality of holdings in a portfolio, whilst maintaining the same diversification, the portfolio will consequently achieve greater returns while decreasing the overall risk. On the other hand, the findings show that the MSCI Weighted Average Key Issue Score remains largely the same, regardless of materiality increasing. This suggests that the material ESG score is a better indicator of financial performance, linking sustainable materiality with risk and returns. On the other hand, the MSCI ESG score is more oriented towards the performance of firms on ESG issues that are generating large externalities in their respective industry.

## 4. Conclusion & Areas of Future Research

### 4.1 Conclusion

Aggregated evidence of over 2000 empirical studies have found that nearly all research finds, at the minimum, non-negative performance, with the majority finding outperformance of ESG impact on corporate financial performance (Friede et al., 2015). However, there are still large discrepancies in the findings of each study, dependent on the ESG data that is used. This research uses the materiality framework of the Sustainability Accounting Standards Board (SASB) to identify the effect of materiality on ESG performance by classifying material ESG issues for firms on an industry level. By classifying material ESG issues on an industry level, this paper takes into account that varying sustainable issues are likely to impact companies' financial condition and operational performance in a different manner depending on the specific industry (SASB, n.d.). In guidance with data supplied by MSCI ESG Research, material issues, as defined by SASB, are matched to MSCI data points and firms' material performance is quantified in order to measure the financial performance of material firms against ACTIAM's active portfolio and the benchmark. The findings provide evidence that firms with superior performance on material sustainability issues outperform the active portfolio and the benchmark in Europe. In addition, material firms outperform firms who score low on material issues, as well as outperform firms who score high on immaterial issues. These results are a further confirmation to the study performed by Khan et al. (2015), who also found material firm outperformance over firms with low material scores.

The findings are the first of its kind to provide a practical explanation, for asset managers, on how they can improve the financial risk and returns of their portfolios while simultaneously improving their sustainability performance. While keeping diversification constant, replacing firms from the active portfolio with similar firms that have a higher material score, will consequently raise the financial returns and concurrently decrease market risk. In fact, using industry excess returns, the Test 3 portfolio significantly outperforms the market by 22 basis points per month more than the active portfolio, while having half the market risk. These findings are robust to multiple factor models as well as to the exclusion of undervalued sin-stocks. Overall, the results are in accordance with the findings of Khan et al. (2015) and strongly advise asset managers to use SASB's materiality framework in their portfolio management and engagement strategies.

### 4.2 Areas of Further Research

The aim of this paper is to provide a start for the vast amount of additional research available in the field of material sustainability. While the results are comprehensive and robust, researchers are encouraged to expand on this study and provide more evidence on the financial benefits of material sustainability. One area of further research would be to measure the direct relationship between a firm improving its material score and the resultant increase in financial performance of that particular firm. This research only finds causation that firms with high scores on material sustainability topics have greater risk-return properties. To continue this research, historical MSCI data will need to be obtained and used. Finding outperformance for individual firms that increase their material score will be of particular importance for engagement purposes. One such study which looks at this, is by

Chaudhry et al. (2016), who test the performance of stocks with changing ESG momentum. Firms that have rising ESG performance outperform those with falling ESG momentum. This same method could be applied to test the performance of firms with rising material ESG momentum. At the same time, future research is encouraged to investigate the additional financial benefits of firms who have a high material score, and a low immaterial score at the same time, as first highlighted by Khan et al. (2015). A further area of research would be to optimise the back testing used in this analysis. While this research uses the holdings of the active portfolio and MSCI Europe Index as of 30 June 2016, and keeps them fixed when analysing past performance, it is beneficial to use the historical positions and weightings of both the fund and index, updating them on a monthly basis. This will account for survivorship bias as well as give a more accurate reflection of past fund performance. Finally, this paper experienced difficulty in finding high scoring material substitutions for the Test 1 and 2 portfolios, given the relatively small sample available. In order to find the most appropriate material substitutes on an industry level, further research should cover a broader sample, such as all mid cap and large cap firms in developed Europe.

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## 6. Appendix

*Appendix 1 - SASB Materiality Map per sector level. Dark (light) grey colour means that for more (less) than 50% of the industries within the sector the issue is material. White means that the issue is not material for any industry within the sector. The materiality map on an industry level is available on [materiality.sasb.org](http://materiality.sasb.org)*



### SASB Materiality Map™

SASB's Materiality Map identifies likely material sustainability issues on an industry-by-industry basis. Click on a highlighted cell at the sector-level and then on any highlighted cell at the industry-level to see suggested accounting metrics and additional information for each issue.

#### Sector Level Map

- Issue is likely to be material for more than 50% of industries in sector
- Issue is likely to be material for less than 50% of industries in sector
- Issue is not likely to be material for any of the industries in sector

#### Industry Level Map

- Not likely a material issue for companies in the industry
- Likely a material issue for companies in the industry

ISSUES	Health Care	Financials	Technology and Communications	Non-Renewable Resources	Transportation	Services	Resource Transformation	Consumption	Renewable Resources & Alternative Energy	Infrastructure
	Click to expand	Click to expand	Click to expand	Click to expand	Click to expand	Click to expand	Click to expand	Click to expand	Click to expand	Click to expand
<b>Environment</b>										
GHG emissions										
Air quality										
Energy management										
Fuel management										
Water and wastewater management										
Waste and hazardous materials management										
Biodiversity impacts										
<b>Social Capital</b>										
Human rights and community relations										
Access and affordability										
Customer welfare										
Data security and customer privacy										
Fair disclosure and labeling										
Fair marketing and advertising										
<b>Human Capital</b>										
Labor relations										
Fair labor practices										
Employee health, safety and wellbeing										
Diversity and inclusion										
Compensation and benefits										
Recruitment, development and retention										
<b>Business Model and Innovation</b>										
Lifecycle impacts of products and services										
Environmental, social impacts on assets & operations										
Product packaging										
Product quality and safety										
<b>Leadership and Governance</b>										
Systemic risk management										
Accident and safety management										
Business ethics and transparency of payments										
Competitive behavior										
Regulatory capture and political influence										
Materials sourcing										
Supply chain management										

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Source: Sustainability Accounting Standards Board 2016. [materiality.sasb.org](http://materiality.sasb.org)

*Appendix 2 - The number of firms, from the sample, categorised by SICs sector*

#### Frequency by Sector

Sector	# unique firms
Services	43
Financials	86
Infrastructure	47
Consumption	66
Resource Transformation	72
Health Care	26
Non-Renewable Resources	39
Transportation	29
Technology and Communications	35
Renewable Resources and Alternative Energy	5
<b>Total</b>	<b>448</b>

*Appendix 3 - The number of material and immaterial SASB issues per SIC classified industry*

Industry	Sector	Materiality Indicators	Immateriality Indicator
Food Retailers & Distributors	Consumption	15	15
Meat, Poultry & Dairy	Consumption	11	19
Processed Foods	Consumption	10	20
Non-Alcoholic Beverages	Consumption	9	21
Multiline and Specialty Retailers & Distributors	Consumption	8	22
Alcoholic Beverages	Consumption	7	23
E-Commerce	Consumption	7	23
Drug Retailers & Convenience Stores	Consumption	6	24
Household & Personal Products	Consumption	5	25
Building Products & Furnishings	Consumption	4	26
Apparel, Accessories & Footwear	Consumption	3	27
Tobacco	Consumption	3	27
Appliance Manufacturing	Consumption	2	28
Toys & Sporting Goods	Consumption	2	28
Asset Management & Custody Activities	Financials	6	24
Commercial Banks	Financials	6	24
Insurance	Financials	5	25
Investment Banking & Brokerage	Financials	5	25
Consumer Finance	Financials	4	26
Security & Commodity Exchanges	Financials	3	27
Biotechnology	Health Care	12	18
Pharmaceuticals	Health Care	12	18
Medical Equipment & Supplies	Health Care	11	19
Health Care Delivery	Health Care	9	21
Electric Utilities	Infrastructure	10	20
Engineering & Construction Services	Infrastructure	7	23
Water Utilities	Infrastructure	6	24
Home Builders	Infrastructure	5	25
Real Estate Owners, Developers & Investment Trusts	Infrastructure	4	26
Gas Utilities	Infrastructure	2	28
Oil & Gas - Exploration & Production	Non-Renewable Resources	11	19
Metals & Mining	Non-Renewable Resources	10	20
Construction Materials	Non-Renewable Resources	9	21
Oil & Gas - Refining & Marketing	Non-Renewable Resources	9	21
Iron & Steel Producers	Non-Renewable Resources	8	22
Oil & Gas - Services	Non-Renewable Resources	8	22
Oil & Gas - Midstream	Non-Renewable Resources	5	25
Pulp & Paper Products	Renewable Resources and Alternative Energy	6	24
Wind Energy	Renewable Resources and Alternative Energy	5	25
Chemicals	Resource Transformation	10	20
Containers & Packaging	Resource Transformation	10	20
Aerospace & Defense	Resource Transformation	8	22
Electrical & Electronic Equipment	Resource Transformation	7	23
Industrial Machinery & Goods	Resource Transformation	4	26
Cruise Lines	Services	10	20
Restaurants	Services	10	20
Hotels & Lodging	Services	7	23
Cable & Satellite	Services	5	25
Casinos & Gaming	Services	5	25
Media Production & Distribution	Services	5	25
Leisure Facilities	Services	4	26
Professional Services	Services	4	26
Advertising & Marketing	Services	3	27
Semiconductors	Technology and Communications	9	21
Software & IT Services	Technology and Communications	7	23
Internet Media & Services	Technology and Communications	6	24
Hardware	Technology and Communications	5	25
Telecommunications	Technology and Communications	5	25



Marine Transportation	Transportation	8	22
Air Freight & Logistics	Transportation	7	23
Auto Parts	Transportation	6	24
Rail Transportation	Transportation	6	24
Airlines	Transportation	5	25
Automobiles	Transportation	5	25

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