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Doing well while doing what?

An empirical analysis of exclusionary screening of the Norwegian Pension Fund Global on excluded companies' returns from 2005 to 2022

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Acknowledgments

This thesis was written as the final part of our Master's degree in Economics and Business Administration at the Norwegian School of Economics, with a specialization in Financial Economics.

In collaboration with the Office of the Supervisory Council in Norges Bank, we aimed to shed light on the Norwegian Government Pension Fund Global as a responsible investor. While writing this thesis, we have acquired valuable information on responsible investing and how the Fund is operated. We wanted to contribute to the existing literature on the ethical guidelines and examine how companies' financial performance relates to the exclusionary screening of the GPFG.

Our analysis has required knowledge of financial and econometric theory as well as knowledge in both R-Studio and Microsoft Excel. The process of completing this thesis has been challenging, nonetheless highly educational and interesting. Hopefully, our work is of value and interest for both investors and academics.

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Abstract

This thesis investigates whether the excluded companies from the Norwegian Government Pension Fund Global ("GPFG" - "The Fund") investment universe delivers superior excess returns (alpha). The ethical-based exclusionary screening of the GPFG, as the world's largest stock owner and one of the most transparent sovereign wealth funds in the world, provides a sample of stocks that face widespread exclusions by other institutional investors. We construct sub-portfolios based on criteria for exclusion, if companies belong to developed or emerging markets, and economic sector affiliation. The performance implications of these portfolios are investigated from September 2005 to August 2022.

In our performance regressions, we apply the Fama-French five-factor model to estimate superior excess returns (alphas) and to control for possible differences in risk exposure between the excess returns of sub-portfolios and the market index used by the GPFG. We find statistically significant and positive alpha estimates of 19 out of 26 sub-portfolios. The results of this thesis indicate that companies excluded based on their products delivers superior excess returns, and the outperformance cannot be explained by sector-specific effects. Altogether, our findings are in line with previous research suggesting that exclusionary screening harms financial performance in this period, and thus the GPFG as a responsible investor are sacrificing financial returns. Our analysis suggest that the Fund has had a loss of USD 8.24 billion from 2005 to 2022. We note that the findings of this paper may be affected by the methodological choice.

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1. Introduction

The Norwegian Government Pension Fund Global ("GPFG" - "The Fund") is the largest stock owner globally, owning approximately 1.3% of all publicly listed stocks (NBIM, 2022a). Accordingly, the Fund is part-owners of thousands of companies worldwide and is arguably partly responsible for the actions of companies they own. Norway's GPFG seeks to be a responsible investor and to live up to the ethical standards and norms expected of them by the public. The Fund's ethical guidelines allow them to exclude companies from their equity investment universe[1] which produce certain types of products or violates ethical principles (NBIM, 2021a). Exclusion of companies is chosen only in a minority of cases and is viewed as a reaction of last resort relative to active ownership. The GPFG's exclusions can be viewed as a list of "worst offenders", which are by many institutional investors used as a model, typically following their decision on exclusion.

The statutory objective of the Fund is to achieve the highest possible return with an acceptable level of risk, as outlined in the mandate by the Ministry of Finance ("MoF") (The Norwegian Government, 2021). For this thesis, the essential part of this mandate is that it specifies a target portfolio for its equity part. This equity portfolio is a weighted average of the world's stock markets, close to a world portfolio together with a maximum allowed tracking error[2] (NBIM, 2021b). Furthermore, the mandate instructs the GPFG to have an active strategy attempting to achieve returns above those of the target portfolio within specific risk limits. Exclusions of companies from the Fund's equity universe will lead to deviations from a well-diversified market portfolio and are consequently a financial cost of the GPFG.

Our thesis builds on existing literature assessing the financial performance implications of exclusionary screening. In the most recent study of the GPFG from 2022, Berle, He, and Ødegaard found that excluded companies deliver superior returns (alpha) and the effect is mostly driven by conduct-excluded companies. However, previous studies have not investigated other sub-portfolios. Literature shows that exclusionary screening and particularly screening based on industries that offer products and services considered as "sinful", and/or unethical, financially harms investors as these stocks tend to offer superior

[1] All the companies the Fund is allowed to invest in
[2] Tracking error is the difference between the return of the target portfolio and the Fund's portfolio

financial performance (e.g., Fabozzi et al. 2008; Hong and Kacperczyk 2009). Additionally, there is a study showing the ambiguity of using ESG information in emerging markets compared to developed markets (Junttila et al., 2022), and another study suggesting that the effect of herding behavior is larger in emerging markets (Harto et al., 2021). Hence, it is interesting to further investigate the consequences on returns of sub-portfolios of the excluded companies, to better understand where the superior returns are created.

We analyze this objective by looking at a fourfold research question, seeking to answer if there are performance differences between i) developed and emerging markets, ii) sub-periods, iii) economic sectors, and iv) criteria for exclusion. We use performance tests to analyze our sub-portfolio's return in excess of the market or sector return. Additionally, we use the global version of the Fama and French five-factor model and measure the excess return relative to GPFG's equity benchmark. Our results show that the excluded companies deliver superior excess returns (alpha). The annualized alpha estimates are statistically significant and positive between 4.9% to 39.3% of 19 out of 26 sub-portfolios. We find significant alpha estimates for all sub-periods in developed and emerging markets, but conflicting results about which exclusion criteria that delivers superior excess returns. Companies excluded for both product and conduct are significant in emerging markets, while only companies excluded for products are significant in developed markets. Furthermore, when splitting the companies into economic sector affiliation to investigate sector-specific effects, we find that five out of six portfolios deliver superior excess returns with only product-based exclusions being significant. These findings suggest that sector-specific effects cannot explain the performance results. Additionally, our results imply that these product excluded stocks have common firm- or industry-specific characteristics which may explain the returns and not explicitly the exclusion announcement made by the GPFG.

The remainder of our thesis is structured as follows. Chapter two provides background information on the GPFG as a responsible investor, the relevant literature on our topic, and a presentation of research questions. Chapter three will explain the data gathering, the adjustments made during this process, and how the exclusion sub-portfolios were constructed. Chapter four describes the methodology used in our analysis, model testing, and potential weaknesses of the applied models. The results of the performance regressions are presented in chapter five, and furthermore discussed in chapter six. Lastly, chapter seven will provide our conclusion and raise suggestions for further research.

2. Background

In this chapter we will start by enlightening what is meant by responsible investing and how Norway's GPFG accommodates this area in its investment strategy. This implies elaborating on the Fund's ethical guidelines, the institutional organization behind the identification and compliance of these guidelines, and to what extent the Fund influences other investors by its ethical investment focus. Thereafter, we will review relevant literature on this topic before we present our research question at the end of the chapter.

2.1 Responsible investments

Responsible investing can be viewed as a term defining an investor's search for both return and sustainable value. This implies that the investor considers environmental and ethical aspects in their investment decisions, as well as stock's financial features (MBN, 2022). Responsible investing strategies and focus areas are numerous[3] and for the purpose of this thesis and its analysis, the focus will be on the ethical aspects including ESG, being that environmental, social, and governance factors, are viewed as ethical responsibilities.

The GPFG seeks to integrate these ethical considerations into its responsible investment management. As the Fund has continuously grown since its establishment, its investments have also expanded across companies, countries, and regions. Throughout the Fund`s existence, the political and economic conditions have additionally altered worldwide, and can impact the Fund’s financial risk and further affect its long-term performance (NBIM, 2020a, NBIM, 2022b). To combine the GPFG’s goal of being both a global and a responsible investor, the investments are well-regulated and continuously adapting to safeguard the value and performance for future generations (NBIM, 2020a; NBIM, n.d.).

[3] For more information we refer to Cambridge Institute of Sustainability leadership (University of Cambridge, 2014)

2.1.1 Ethical guidelines

The GPFG's investments have been subject to formally designed ethical guidelines since 2004, but the first exclusion from the investment universe took place as early as 2002 (Council on Ethics, 2005; NBIM, 2006). The exclusion of Singapore Technologies Engineering in 2002 was determined by the Council on Ethics forerunner, the Petroleum Fund Advisory Commission (NBIM, 2020a). This decision set the fundament for the outline of ethical guidelines and the exclusions from the Fund's investment universe.

The guidelines are defined to identify sectors and companies' activities and behavior that are not in line with the ethical view among the Norwegian public and the beliefs of what could deliver sustainable economic growth (NBIM, 2019a; NOU, 2020:7). The guidelines are aimed to safeguard both the present and future perspective of which companies the GPFG should refrain from investing in and be aware of how our descendants would want the Fund to be invested today (NOU 2003: 22, p.48). This implies that companies violating ethical norms, and companies representing an unacceptable high future ethical risk to the Fund are excluded from the investment universe.

These guidelines further map whether a company should be excluded or placed on the observation list (NBIM, 2019a). Exclusion of a company removes it from the Fund's investment universe and is referred to as exclusionary or negative screening, i.e., removing the "worst offenders". When there exist uncertain grounds for exclusion, the company can be placed on the observation list (NOU 2020:7, p.4). Companies can be excluded or put under observation based on two different criteria. The first criterion is product-based, currently including the production of tobacco, cannabis, certain types of weapons, E&P companies within oil and gas, and coal. Exclusion based on products will often lead to an entire industry being excluded and can be viewed as industry-specific screens. The second criterion is conduct-based, currently including violation of human rights, environmental damage, unacceptable levels of greenhouse gas emissions, corruption, and sale of weapons to specific states (Council on Ethics, 2021a). The two criteria differ as the product-criterion is seen as a "shall" criterion. In contrast, the conduct-criterion is referred to as a "can" criterion (E.A. Lund, Head of Secretariat CoE, personal interview, October 26, 2022). Companies may be excluded based on this conduct-criterion if there is an unacceptable risk of conduct considered to constitute a particularly serious violation of ethical norms. These differences imply that if

a company produces tobacco, it *shall* be excluded, but if a company is involved in corruption or other violations of the conduct-criterion, it *may* be excluded.

Even though the official term “ethical guidelines'” was left formally in 2010, the guidelines' substance is however retrained in other provisions (NOU 2020:7). The guidelines have aimed to accommodate relevant trends since its convention was amended. Particularly, the increased consciousness towards environmental, social, and governance as aspects of responsible investing has forced the guidelines to continuously develop and improve to reflect this awareness.

The most recent change affecting the guidelines happened in September 2022, when recommendations made by the 2020-committee reviewing the guidelines were implemented in the mandate for the management of the Government Pension Fund Global (Ministry of Finance, 2022a; Ministry of Finance, 2022b; NOU 2020:7). One of the changes was to include the United Nations Guiding Principles on Business and Human Rights (UNGP) in §4-2 (3). These principles deliver guidelines supported by national and international consensus, as they are embedded by international standards (NOU 2020:7; NBIM, 2020b). The UNGP-principles are seen to provide the essence of the S (Social) in ESG (UN, 2021), where integration in financial markets is seen to be one of the key aspects to accelerate the improvement of human rights (UN, 2021; Mazars LPP & Shift, 2015).

The guidelines for exclusion and observation will continue to change and set the fundament for future decisions. In addition to these historically identified criteria for exclusions and observations, other areas can be the targeted focus in the future. The Fund’s planned reduction of companies in its investment universe could also ease the investigation of unethical behavior and production among the remaining companies (The Storting, 2021; E.A. Lund, Head of Secretariat CoE, personal interview, October 26, 2022).

2.1.2 Institutional Background

There are three main institutions that govern the ethical guidelines of the GPFG. The first is the Ministry of Finance (MoF), which is the official institution that owns the Fund and is responsible for its investment policies. The ethical guidelines are determined by the MoF.

The second institution is the Council on Ethics (CoE). The CoE was established in November 2004, following the establishment of the ethical guidelines (Council on Ethics, 2005). The purpose and primary function of the CoE are to make independent ethical assessments of companies while ignoring the economic aspect. Hence, the CoE provides recommendations for observation or exclusion from the Fund of individual companies, subject to the guidelines provided by the MoF (E.A. Lund, Head of Secretariat CoE, personal interview, October 26, 2022).

The third institution is the Executive Board of Norges Bank. Norges Bank is the institution managing and operating the GPFG. When the CoE concludes that a company has breached the Fund's ethical guidelines, it presents a recommendation to the Executive Board of Norges Bank. As the operational manager of the GPFG, the executive board reviews the CoE's recommendations and makes the final decision to exclude firms, have them under observation, and/or exercise ownership rights[4].

This tripartite process has existed since 2015. Prior to 2015, the CoE would give recommendations to the MoF which made the final decisions. Norges Bank was then responsible for acting on the decision taken by the MoF. This change was implemented with the ambition of increased coordination of exclusion and engagement initiatives (Council on Ethics, 2014).

2.1.3 Exclusion, observation, and active ownership

The process of identifying and deciding on companies to exclude, put under observation, or execute active ownership, is dynamic. The threshold for excluding companies from the Fund's investment universe is particularly high, as this action may affect both the company itself and the Fund. For the former, the reason for their exclusion is made public for everyone to view, and for the latter, it misses out on investment opportunities (NOU 2020: 7, p.5).

[4] Norges Bank can exclude companies without recommendations from the CoE based on the coal-criterion §3(2) and greenhouse gas emissions-criterion §4 f in the *Guidelines for observation and exclusion from the Government Pension Fund Global* (Ministry of Finance, 2021).

A company is not excluded or put under observation permanently. The decision can be revoked as soon as the grounds of exclusion or observation cease to exist. The CoE examines whether the respective company still operates in a way or in a business leading to its exclusion or observation on an annual basis (Council on Ethics, 2021a). When reviewing the new information, the CoE may recommend that Norges Bank revoke an observation or exclusion decision (NBIM, 2016a). The final action is grounded by a discussion with Norges Bank which has information about the company's corporate interactions (Ministry of Finance, 2021).

In addition to the two most prominent measures, exclusion or observation, the ethical guidelines allow Norges Bank to consider exercising active ownership rights rather than following the advice of the CoE. This targets to influence the flagged company to change and further sufficiently reduce the risk of continuing its violation of the Fund's ethical norms (NOU 2020: 7, p.3).

The Fund provides considerable information to the public on its decisions to exclude, observe, take active ownership, or re-include companies due to ethical reasons. However, the announcement of the decision is first published by the CoE after Norges Bank has agreed to proceed with their recommendation. In the case of an exclusion decision, the process provides the GPFG time to divest any firms in which they own shares prior to publishing information to the public. In occasions where a company is divested, the exact sale date(s) are not publicly announced and remain unclear.

The Fund also conducts its own risk-based divestments (NBIM, 2020a). These divestments are part of the Fund’s risk management[5] but are not published. The underpinnings of such decisions are transparent. Though, these divestments made by the Fund itself will not be analyzed in our thesis.

[5] These divestments are made from a financial point of view only. Removing companies with possible elevated long-term risks where the business is not considered sustainable and could have financial consequences (NBIM, 2019b).

2.1.4 Norway's GPFG as an influential investor

At last, we seek to enlighten to what extent decisions made by Norway's GPFG can influence other investors' investment decisions. The GPFG is the largest stock owner globally, a large institutional investor, and is currently ranked as the largest sovereign wealth fund in the world (Statista, 2022). The Fund is also ranked to be one of the most transparent sovereign wealth funds, particularly with respect to its responsible investments (GPTB, 2022). In July 2006, the Fund became a signatory to the UN Principles of Responsible Investment (PRI). Consequently, the Fund has become a global leader in responsible investing (Milhench, 2016).

One can dispute whether the Fund's product exclusions are revealing any new information about a company's behavior, as investors presumably would be aware of which companies produce coal, tobacco, or other harmful outputs. The announcements may, however, frame the company's behavior as unethical. As a large institutional investor, the GPFG could therefore play a part in monitoring unethical behavior for investors with limited resources or where information is less transparent. Furthermore, it is familiar to most large investors the superior amount of resources the GPFG uses both on the recommendations made of the CoE and the final decisions of exclusion or observation. Thus, these are seemingly well grounded as a foundation for responsible investments.

Some of the largest institutional investors in Norway have publicly stated that they will follow both the decisions made by the GPFG on exclusions of companies, in addition to establishing identical or similar criteria for their own exclusions[6]. The extent this applies outside the Norwegian border appears to be relatively widespread. For example, the Fund's exclusions are making headlines in international papers such as the Financial Times (Financial Times, 2019). Additionally, there are several examples of herding behavior[7] among large Scandinavian pension funds (e.g., AP2, 2006; IPE, 2020). Evidently, the GPFG has the potential to influence other investors.

[6] E.g., KLP, DNB, Storebrand, and Sparebank1

[7] "This effect is evident when people do what others are doing instead of using their own information or making independent decisions" (Behavioral Economics, n.d).

2.2 Literature review

Our thesis is an investigation of exclusionary screening of companies based on the GPFG's ethical guidelines and how these screened companies are impacted in terms of returns. Before presenting our research question, the following section presents existing theories and literature on subjects relevant to our analysis.

2.2.1 Performance Effects of Exclusionary Screening

There is various literature looking for links between ESG characteristics and company performance. The theoretical model of Pástor et al. (2021) argues that when there is a portion of investors who get utility from high-ranked ESG companies beyond the pure monetary return, these companies can sustain lower returns. Pástor et al. 's (2021) framework asserts that higher ESG quality of a company decreases the expected return when the market is ESG-aware. When norm-constrained influential investors such as the GPFG shun controversial stocks which can be viewed as the worst offenders, it leads to limited risk sharing among those investors that hold these companies. Consequently, investors require higher returns for holding the controversial stocks (Derwall et al., 2011; Hoepner & Schopohl, 2018).

Another recent study by Avramov et al. (2021), points to a moderating effect on the ESG-return relationship, which is the uncertainty around ESG itself. There is empirical evidence showing that ESG ranking providers do not agree on their ESG rankings, which introduces noise in estimation of ESG-return relationship (Berg et al., 2022). Thus, an announcement by the GPFG may, according to the model by Avramov et al. (2021), trigger a re-evaluation of required returns for the respective company.

As this thesis looks directly at the stocks in question, the exclusionary screening of the GPFG stands closer aligned to the literature investigating what is called "sin" stocks[8]. When the GPFG excludes companies, it reduces its feasible set of investment portfolios and worsens the risk/return trade-off. This kind of reasoning was behind some of the early empirical work on "sin" stocks, finding evidence of superior returns for industries commonly excluded by ESG

[8] "A sin stock is typically a publicly traded company involved in or associated with an activity that is considered unethical or immoral. Sin stocks are generally in sectors that deal directly with morally dubious actions" (Kenton, 2020).

screens (e.g., tobacco and weapons). A pioneering study on "sin" stocks by Hong and Kacperczyk (2009), investigated 156 U.S. companies that operate in sectors related to typical "sinful" industries[9]. They found evidence of a positive abnormal return relative to industry-comparable stocks over the period 1965–2006.

Fabozzi et al. (2008) found that "sin" stocks outperform common benchmarks due to several reasons. One important explanation pointed at was the often monopolistic nature of these "sin" industries and the related headline risk. It is argued that "sin" stocks are systematically underpriced because many investors actively avoid these stocks. Hence, those that are willing to invest in "sin" stocks will be compensated for it.

In a similar sense, newer studies look at wider definitions of "sin" closely aligned with our investigation. Chava (2014) investigates the effects of concerns on environmental issues and further advocates that stocks excluded by screens based on environmental matters have higher expected returns. In line with these findings, Bolton and Kacperczyk (2021) found evidence that stocks with higher carbon emissions, i.e., both in terms of levels and innovations, earn higher returns.

Whether or not there exists a "sin" premium is, however, ambiguous. Blitz and Fabozzi (2017) revisit the "sin" anomaly and conclude that there are no abnormal returns related to "sin" investing when controlling for other factors, such as profitability and investment strategy. However, they do not benchmark companies against matched samples, as in the case of Hong and Kacperczyk (2009). Capelle-Blancard and Monjon (2014) investigates both sector- and conduct-based screening but finds no association between other screening mechanisms and lower expected fund returns except for the exclusion of typical "sin" stocks. Furthermore, there are studies that find that the extent to which investors avoid "sin" stocks significantly varies across markets, and that markets with more restrictive social norms show a stronger ‘‘sin" effect (e.g., Salaber, 2013; Adamsson & Hoepner, 2015).

There is also literature studying the impact on firm values of negative announcements concerning environmental incidents, human and labor rights, which can be viewed in context

[9] They investigated tobacco, alcohol, and gambling.

of conduct-based exclusion. Research shows that breaches of norms and unethical business practices are less visible to the market (Kappel et al., 2009; Flammer, 2013; Hirch and Cha, 2015). Peculiarly due to the fact companies have a high incentive to obscure the real extent of the specific incident. Predominantly, results show a loss in firm value around the announcement date indicating that the market previously mispriced the risk of the company. On the other hand, it may be costly to implement and uphold social and environmental standards. Hence, to comply with these norms will decrease a firm's profits. Especially if the cost of complying with norms is higher than the costs of breaking the standards (e.g., reputational cost). Non-compliant companies are therefore expected to show higher future profits and cash flows (Fabozzi et al., 2008)

Previous research suggests that the impact of exclusionary screening on performance is conditional on the reason for exclusion. As our analysis looks at both product- and conduct-based screening, we expect that investors are compensated differently depending on which of these screening criteria companies are excluded on. Particularly, it is interesting to investigate if superior excess returns of excluded companies of the GPFG are driven by sector effects rather than an ESG risk premium, as we predominantly look at specific firms within industries typically labeled as “sinful”.

2.2.2 Responsible Investments in Developed and Emerging markets

The attention towards responsible investment and particularly ESG has been growing much faster in developed markets[10]. Reasonably, this development can be related to, inter alia, emerging markets[11] companies’ different ownership structures, institutional context[12], the risk profile of companies[13], limited disclosure, and undeveloped capital markets (Odell & Ali, 2016; Garcia et al., 2017). Garcia et al. (2017) emphasize that developed countries' ESG initiatives are both encouraged and even pressured, whereas responsible investments in

[10] A developed market is a country that is most developed in terms of its economy and capital markets (Boyle, 2022).

[11] An emerging market is generally considered a market that is transitioning into a developed market economy (Scott, 2022).

[12] Institutional context refers to the evidence of emerging markets having limited prosecution of liability laws and that dissemination of information is on a considerably lower level.

[13] Risk profile refers to that in emerging markets investors have only little trustworthy information about companies whereas in developed countries investors have free access to trustworthy and accurate information.

emerging markets remain at a quite low level. Harto et al. (2021) suggests that emerging markets as a collective are more vulnerable to the consensus view. Viewing this in line with the literature of Garcia et al. (2017), it is interesting to see if the effect on returns of the announcement made by the GPFG differs between emerging and developed markets.

Our research thus intersects with literature linking ESG to differences between developed and emerging markets. ESG has been the subject of extensive research, yet no consensus has been reached on the performance of investments based on ESG criteria. To the best of our knowledge, there is only one similar study to ours that looks at performance implications of screenings in connection to ESG in both developed and emerging markets.

Junttila et al. (2022) examines the implications on performance of a long-short strategy based on ESG-ratings in both markets. In their study, they challenge the claim that the simple pursuit of a high ESG investment strategy leads to outperformance. By examining investment performance based on ESG in 48 countries their findings show positive abnormal returns for both high and low ESG-rated portfolios in emerging markets from 2016 to 2020. These results indicate both the potential and ambiguity of using ESG information in these markets. Inconsistency in the firm-level information reflected in ESG metrics from different data sources is emphasized, which may give different outcomes when considered in investment decisions. In contrast, developed markets' high ESG-rated portfolios underperform compared to low-rated portfolios. Junttila et al. (2022) findings in developed markets are thus in line with investors' demands for higher returns as compensation for exposure to ESG-related risk.

2.2.3 Prior studies of the GPFG

A recent study by Berle, He, and Ødegaard (2022) investigates the expected return of the excluded companies of the GPFG. They measure performance as alpha relative to the Fama-French five-factor model similar to the applied methodology in our analysis. Results show that the value-weighted portfolio of all excluded companies has a significantly superior performance by about 6.9%, and 7.2% for the U.S. portfolios. Further, conduct-based excluded companies have an annual highly significant alpha of 11.3%, while product-based excluded companies have an annual significant alpha of 4.6%. Particularly the last few years seem to be driving the higher alpha estimates for the conduct-based portfolio according to their analysis. Beyond this, Berle et al. (2022) do not present any clear explanation for the higher alpha estimate.

Berle et al. (2022) claim that the most prominent effect of the observed superior return is not the announcement itself, but that the GPFG identifies companies which are irresponsible, and thus have a return premium connected to being low quality ESG. This can be viewed in light of the findings by Atta-Darkua (2020). Her findings suggest that the effects are more likely to be driven by the ethics component of the announcement rather than the news that the Fund will no longer own shares in the company. Results in her study show that companies for which an exclusion recommendation was published but where the final decision was not to exclude, have similar cumulative abnormal returns to excluded firms.

Both Atta-Darkua (2020) and Eriksen et al. (2020) researched the short-term price reaction to the GPFG's announcements. The former study provides insightful information regarding the implications for firm equity value and ownership structure. For firms excluded under the product-criterion, the effect seems to be driven by the divesting behavior of ethics-sensitive investors, particularly those under the coal-criterion. However, it is emphasized that it cannot be concluded that coal exclusions in particular cause a stronger return reaction than non-coal exclusions as the difference could be due to firm characteristics.

The latter event study by Eriksen et al. (2020) finds that the GPFG immediately influences market prices negatively through its announcements. The price reactions do not appear to be permanent and are insignificant beyond the announcement date, as in opposition to the findings by Atta-Darkua (2020). Conforming with the Berle et al. (2022), they find that companies announced for their conduct face a larger magnitude of price reaction than those announced for their product. Additionally, they find evidence implying that more recent announcements are associated with more negative abnormal returns. Berle et al. (2022) found positive but lower and not always significant alpha estimates, when splitting the estimation period into two sub-periods, 2005-2015 and 2016-2021.

There are in addition studies like ours and Berle et al. 's (2002) that look beyond the immediate market reaction and investigate the returns of the stocks excluded of the GPFG[14]. In relation to our analysis, the most prominent study was by Beck and Fidora (2008). The duo investigated stock returns of the excluded companies in connection to a sector-specific index capturing

[14] E.g., Hoepner and Schopohl (2018)

sector-specific developments. Their results showed no significant effects. However, this was an early study making use of a considerably smaller sample (i.e., 20) of exclusion than our thesis, as well as using a different methodology than us[15]. This provides an interesting insight for this thesis to revisit these findings.

[15] They use CAPM that relates the return of a given equity r to two explanatory factors: (i) the return of a domestic equity index RM, capturing financial market developments in the economy, and (ii) the return of a sector-specific index RS, capturing sector-specific developments.

2.3 Research question

The literature review highlights the inconclusiveness of the prior literature about the performance effects of exclusionary screening in general and of the GPFG. Given the special role of the GPFG, shedding light on these topics is not only of relevance to the Fund itself, but also to other global market players, policymakers, and the Norwegian public. In our thesis we will mainly focus on answering the following research question:

Do the excluded companies of the GPFG deliver superior excess returns, and where, when, and why are these returns created?

Based on the presented literature, we believe excluded companies will deliver superior excess returns, but the effect will differ between markets, timespan, sectors, and exclusion criteria. The main research question can therefore be decomposed into four different sub-questions.

i) Are there differences between developed and emerging markets?
ii) Are there differences between sub-periods in these two markets?
iii) Are there differences between economic sector affiliation?
iv) Are there differences between exclusion criteria?

Firstly, for the first sub-questions, the literature review highlights in sub-section 2.2.2 that there seems to be differences in using and disclosing ESG information in markets. Hence, we believe there will be differences in the screening impact of the GPFG on companies' returns in developed and emerging markets.

Secondly, the attention towards using ESG-information when making investment decisions seems to have grown in recent years for emerging markets, whereas this focus has been established for decades in developed markets. Therefore, it is interesting to analyze if there are differences between selected sub-periods.

Thirdly, previous studies have conflicting conclusions regarding premiums related to "sin" stocks. Most exclusions made by the GPFG can be categorized as industry-specific screens, and these industries can be categorized in the same economic sectors. Hence, it is interesting to investigate if returns can be explained by sector affiliation and sector effects.

Lastly, we want to investigate if the performance implications of exclusionary screening differ across product-based versus conduct-based screens. We want to revisit former findings on performance implications of these sub-portfolios. Berle et al. (2022) found that the alphas of the conduct-based exclusion portfolios are double those of the alphas for the product-based exclusion portfolios, which makes it interesting to see if we find similar results when investigating market- and sector portfolios.

These questions will be explored by estimating alphas (superior excess return) through statistical models. The following chapters will outline how we constructed the exclusion portfolios and the statistical models we will apply to them.

3. Data

This chapter presents the data fundament of the thesis, describing the process of selecting, extracting, and preparing the data for our analysis. All the extracted data and additional information used in our analysis are publicly available. We will start by covering our methods of data extraction, and further how we selected and sorted the stocks into sub-portfolios for more detailed analysis purposes. This implies explaining how we identified the current and historically excluded companies which are included in our portfolios, and further how we assigned them to different markets and economic sectors. We will further outline how we constructed our portfolios and the choice of benchmarks in terms of return comparison. The final section of this chapter will present concerns regarding our data set and method of data retrieval.

3.1 Data Selection

3.1.1 Identification of excluded and revoked companies

Our primary source of data is the announcements and the date for the news release from the CoE and the GPFG on the decision of excluding companies. The data retrieval started with "downloading" an overview of all of these companies listed on GPFG's own website over "Observation and exclusion of companies" (NBIM, 2022c). This site holds a list of release dates and companies currently categorized as excluded from or put under observation in the Fund's investment universe. However, this list does not include previously excluded and revoked companies. To get a full overview of the complete list of excluded companies since the beginning of practicing the guidelines and to carry out our analysis, we retrieved this information from public announcements made by the Executive Board of Norges Bank.

After composing a complete list of excluded companies, we gathered monthly stock market returns and market capitalizations of the companies from Refinitiv financial data provider Eikons' Datastream.

All data is extracted in dollars (USD). The currency adjustment is done to isolate the stock performance returns, by controlling for currency fluctuations which could obfuscate the

performance results making them less or more profitable than the initial returns would show (Christy, 2019).

As table 3.1 shows, we managed to identify 192 excluded companies in the total timespan of the exclusion practice, in the years 2005-2022[16]. Seven of the companies were not found in Datastream, and an additional nine companies were removed from our sample for other reasons. The full list of excluded companies and its corresponding information is found in Appendix.

Table 3.1: Overview of the excluded companies

Table 3.1 show the overview of the data sample in this thesis. 192 companies were identified, and 30 of these were revoked in the sample period. One company was re-excluded, BAE Systems which was excluded the first time in 2006, revoked in 2013, and re-excluded in 2018. Seven of the companies were not found in Refinitiv, and we did not manage to find any other information about these. *Nine of the companies were removed for other reasons, which are outlined in the Appendix.

Status	
Identified exclusions since 2005	192
Revoked companies	30
Re-excluded	1
Not found in Refinitiv	7
Removed for other reasons*	9
Our sample	**176**

3.1.2 Selection of time span

The most recent exclusion of companies from the investment universe was published on the 7th of September 2022. Due to the lack of publicly available Fama-French factors from September 2022, in addition to the short timespan since this publication, we choose to not include these excluded companies in our total sample.

Our selected time span is therefore set from 01.09.2005 until 31.08.2022. As mentioned in sub-section 2.1.1, the consciousness towards ESG has ascended. Therefore, we also want to separate the total timespan we analyze into two sub-periods. This gives us the opportunity to

[16] The first ethically motivated exclusion happened in 2002, when the MoF excluded Singapore Technologies. This observation is removed from our sample as shown in the Appendix.

compare them and explore if there are indications that the return could differ between the periods.

The two chosen sub-periods are 1) 01.10.2005 - 31.12.2016 for developed markets and 1) 01.04.2007 - 31.12.2016 for emerging markets[17], and 2) 01.01.2017 - 31.08.2022 for both markets. This split is made based on multiple considerations. Firstly, many emerging market economies had limited available ESG data before the year 2015, and it is therefore interesting to investigate whether this development could give us decisive results (Järvinen, 2022). Secondly, the accelerating pace of ESG-integration in the latest years can be seen in relation to multilateral and international goals and agreements such as UNs Sustainable Development Goals in 2015, and the signed Paris Agreement in 2016, to mention some (Gratcheva et al., 2020). Therefore, we chose to start our second period in the following year, 2017, of the implementation of the Paris Agreement to cover the latest worldwide agreement that has been established (European Commission, 2022).

Third and last, our timespan also includes one crisis and the aftermath of a crisis each, both [18]the financial crisis in 2008 and 2009, and the COVID-19 crisis in 2020. This implies that our timespan enables us to explore if these excluded companies, which are typically labeled as "sin stocks", are recession-resistant, as Chen's (2020a) definition of defensive stocks suggests.

3.1.3 Separating countries in developed and emerging markets

Based on differences in awareness towards ESG in developed and emerging markets from sub-section 2.2.2, we wanted to see if the performance results would differ across these two markets.

To conduct this analysis on developed and emerging markets, we identified which countries our companies were registered in by using Datastream. We further identified if the respective country was categorized as either a developed or emerging market at the time of exclusion based on the FTSE Russell's historical classifications. These market classifications are in line

[17] The first exclusions were in developing markets in 2005, and later in emerging markets in 2007

with GPFG's own market-specification guidelines, mentioned in their asset management mandate §2-3 (2) outlined by the MoF (Ministry of Finance, 2022b).

As the market categories were assigned to each country at the date of exclusion, it implies that some countries could change market status throughout the investigated timespan. However, there exists only one example of this case in our dataset. South Korea was classified as an emerging market in December 2006 when the first companies in emerging markets were excluded. In 2009, South Korea was classified as a developed market, implying that the rest of the excluded South Korean companies are assigned to this market category (FTSE Russell, 2013).

Table 3.2: Geographical distribution of companies in our sample

Table 3.2 shows the country distribution of the excluded companies in the exclusion portfolios, divided into whether the country was classified as a developed market or an emerging market at the time of exclusion. *South Korea is the only country with changing status in our data sample and is present in both columns.

Distribution of Markets and Countries in our sample			
Developed		**Emerging**	
Australia	4	Brazil	5
Canada	9	Chile	2
France	2	China	17
Germany	1	Czech Republic	1
Hong Kong	10	Egypt	1
Ireland	1	Greece	1
Israel	9	India	13
Italy	1	Indonesia	1
Japan	8	Malaysia	7
Netherlands	1	Mexico	1
Singapore	1	Peru	1
South Korea*	4	Philippines	2
Sweden	1	Poland	4
Switzerland	1	Russia	1
United Kingdom	10	South Africa	3
USA	46	South Korea*	1
		Taiwan	3
		Thailand	3
Total	**109**	**Total**	**67**

3.1.4 Selection of sectors

As many of the exclusions made of the GPFG can be categorized as industry-specific screens as pointed out in 2.1.1 and in view of the literature on "sin" premiums, it is interesting to investigate if returns can be explained by sector affiliation and thus sector effects. Research also shows that sector exposure is one of the most significant drivers of equity market returns (Fidelity, 2013). To identify whether superior excess returns are driven by sector effects or not, the excluded companies were divided based on their economic sector affiliation.

The classification system we have used is The Refinitiv Business Classification (TRBC). This system was chosen based on two different reasons. Firstly, TRBC delivers a five-level hierarchical structure where our thesis has allocated each company to the highest level, the economic sector. This is chosen on the basis that there exist reliable sector benchmarks at this hierarchical level (Utilities, Industrials, Basic materials, etc.).

Secondly, TRBC's ability to classify a wider range of stocks and the use of a more robust process to determine a company's sector classification compared to its peers. Additionally, its availability on Datastream (ETF, 2015). The economic sector information was extracted in Datastream by retrieving the company's economic sector name, to further compose sector portfolios.

TRBC is a market-based framework, implying that business classifications are tied to the market the companies serve, and not the products or services offered. An illustration of how this market approach is practiced is that airline catering service companies are not classified as restaurants, but as airport services due to their financial performance being linked to the market for airline services (Refinitiv, 2022a).

Our portfolio analysis is limited to sectors with more than 10 companies. This implies that we do not look at companies allocated to the Health, Finance, Real Estate, and Technology sectors.

Table 3.3: Distribution of economic sectors

Table 3.3 shows an overview of the total number of companies within each economic sector. These are classified by the TRBC-classification system. Our further analysis only includes the sectors with more than 10 companies over the total sample period.

Distribution of Sectors	
Economic Sector	
Basic Materials	24
Consumer Cyclicals	11
Consumer Non-Cyclicals	20
Energy	23
Financials	1
Healthcare	4
Industrials	36
Real Estate	2
Technology	1
Utilities	54
Total	**176**

3.1.5 Benchmarks and the risk-free rate

Table 3.4: Overview of benchmark choice

Table 3.4 shows an overview of the chosen benchmark index for each portfolio. These benchmarks are chosen to reflect the portfolios respective markets or sector index for return comparison. The FTSE Global All Cap index is used as the reference index and the basis for the construction of the GPFG's own benchmark index. The benchmarks and portfolios are market value-weighted, in line with GPFG's equity portfolio.

Benchmarks	
The Government Pension Fund Global	FTSE Global All Cap
Markets	
Developed Markets	FTSE Developed markets
Emerging Markets	FTSE Emerging markets
Economic Sectors	
Basic Materials	FTSE World Basic Materials
Consumer Cyclical	Refinitiv Global Cyciclical Consumer Goods and Services
Consumer Non-Cyclical	MSCI World Non-Cyclical Sectors
Energy	FTSE World Energy
Industrials	FTSE World Industrials
Utilities	FTSE World Utilities

To compare our portfolio results, we downloaded suitable benchmarks for each individual portfolio based on the accessible benchmarks in Datastream at market- and economic sector-level.

As the companies are divided into developed and emerging markets based on FTSE Russell's classifications, it seemed natural to use FTSEs market indices as our suitable benchmarks. FTSE benchmarks are also used for the Basic Materials, Utilities, Energy, and Industrials sector. There did not exist suitable FTSE benchmarks for the Non-Cyclicals and Cyclicals sectors, so we have used MSCI Non-Cyclical for the Non-Cyclical portfolio, and Refinitiv Global Cyclical Consumer Goods and Services for the Consumer Cyclicals portfolio. All the benchmarks are value-weighted by using market capitalization in the same way as our constructed portfolios.

We have also downloaded the FTSE Global All Cap index which is used as the reference index and the basis for the construction of the GPFG's own benchmark index and investment universe. The FTSE Global All Cap index is market value-weighted, and the return from holding large-, mid- and small-cap stocks. This global index is therefore used as a proxy on how the GPFG otherwise are invested to make any comparisons.

To calculate each portfolio's market premium, we set our risk-free rate to the equivalent of a 1-month Treasury bill. This data was retrieved from the U.S. Department of the Treasury (2022).

3.2 Portfolio Construction

To conduct our analysis, we constructed portfolios based on monthly closing prices and market capitalization data from Datastream. We then structured this data into suitable portfolios for the thesis purpose, based on the companies' markets, economic sectors, and reason for exclusion. All portfolios are value-weighted based on market capitalization.

We choose to value-weight our portfolios because we want larger stocks' return to be given more weight in the total portfolio, and smaller stocks' return to be given less weight. This is done on the basis that the value-weights better represent each company's economic importance, meaning how much each company contributes to the economy. Moreover, to

particularly respect the fact that this is the method used by the GPFG on its equity portfolio and will further allow a more meaningful evaluation of the exclusion's returns effects.

We let a stock enter the exclusion portfolios the month after the company has been excluded from the investment universe. If an exclusion is revoked, the stock is removed from their respective exclusion portfolio the same month as the Executive Board of Norges Bank announces their decision. This implies that if a company is excluded in January, it will be included in the portfolio from February, and if an exclusion was revoked in January, the last month the respective company is represented in the exclusion portfolio is December. The reasoning behind this approach is to eliminate any short-terms effect on returns on the excluded companies as shown by Eriksen et al. (2020) and Atta-Darkua (2020), and the return effects found by Berle et al. (2022) on revoked companies' returns falling back immediately after being re-included in the investment universe.

To demonstrate how we constructed our portfolios, we will describe the portfolio construction in general and not each individual portfolio as this information would be redundant.

3.2.1 Calculating stock return

The retrieved monthly stock data from Datastream are based on closing prices and are adjusted for both dividends and stock splits (Refinitiv, 2022b). We did not do any adjustments to this data. How the stock return values are calculated from Datastream is illustrated in equation 3.1.

$$r_t = \frac{P_t}{P_{t-1}} - 1 \qquad (3.1)$$

Where

$r_t =$ Return at month t

$P_t =$ Adjusted stock price at month t

$P_{t-1} =$ Adjusted stock price at previous month, $t-1$

3.2.2 Market Capitalization and Value-Weighted Return

To create value-weighted portfolios, we calculated company's weighted market capitalization in its corresponding portfolio. We calculated each stocks' market capitalization weight, shown in equation 3.2. The aggregated stock weights in each portfolio always sum to one.

$$w_{i,t} = \frac{mc_{i,t}}{\sum_{i=1}^{N} mc_{i,t}} \qquad (3.2)$$

After identifying each company's market capitalization weight, we multiplied this weight by its corresponding stock return. The accumulated weighted return gives us the respective portfolios' value-weighted return, as shown in equation 3.3.

$$r_{p,t} = \sum_{i=1}^{N} (mc_{i,t} * r_{i,t}) \qquad (3.3)$$

Where

$w_{i,t} =$ Market capitalization weight for company i at month t

$mc_{i,t} =$ Market capitalization for company i at month t

$r_{p,t} =$ Portfolio return for portfolio p at month t

$r_{i,t} =$ Market capitalization weighted return for company i at month t

3.2.3 Exclusion portfolios

After organizing the market capitalization and stock return data, we created 26 portfolios to investigate superior excess returns, as shown in table 3.5. All the 26 portfolios were constructed by using the same approach.

Table 3.5: Overview of the number of companies in each portfolio

Table 3.5 shows an overview of the total number of companies in each constructed sub-portfolio. The total portfolio and product portfolio of the Consumer Non-Cyclicals sector is coinciding and therefore only counted as one portfolio, but visible in both columns. In total there are 26 portfolios.

Portfolio distribution of companies					
Market	**Total**	**Product**	**Conduct**	**2005-2016**	**2017-2022**
Developed markets	109	86	23	79	30
Emerging markets	67	44	23	43	24
Economic Sector					
Basic Materials	24	12	12		
Consumer Cyclicals	11	3	8		
Consumer Non-Cyclicals	20	20			
Energy	23	18	5		
Industrials	36	24	12		
Utilities	54	51	3		

3.2.3.1 Developed and emerging markets portfolios

The developed and emerging markets portfolios were created as illustrated above. We isolated the relevant companies and applied the above-mentioned step-by-step method.

3.2.3.2 Product and conduct portfolios

In addition to the market portfolios, we separated the companies into whether they were excluded based on the product or conduct criteria. The relevant companies were isolated once again, and the same method were applied.

3.2.3.3 Sector portfolios

The same approach was used on the economic sector portfolios, after dividing the total exclusion portfolio into the six different economic sectors we identified in our data set.

3.3 The Fama-French Factors

Dahlquist et al. (2015) recommended using the global Fama-French factors when evaluating the GPFG's equity portfolio and is therefore used in this thesis. The factors were downloaded from the Kenneth French Data Library (Fama & French, 2022a). We managed to retrieve the five-factor data from the first month of exclusions, September 2005, to August 2022, which set the end date of our period under investigation. The Fama-French five-factors are constructed by using six market capitalization-weighted portfolios, which are formed on size and book-to-market values, on size and operating profitability, and size and investment (Fama & French, 2022b).

3.4 Concerns about the dataset

The list of excluded companies that are currently excluded from the GPFG's investment universe, do not include revoked companies. To retrieve this, we identified these companies through announcements made by the Executive Board of Norges Bank. This implies the possibility to have overlooked some companies. Our list of identified companies are, nevertheless, in line with what Berle et al. (2022) found.

The size of the companies in our sample has a large variety of market capitalization. This is later illustrated in table 5.2. This could be a concern if a small number of companies in one of our portfolios is weighted much higher than the others, meaning that our results could be skewed. Berle et al. (2022) showed that despite Walmart having a very large weight in their constructed exclusion portfolio, they found that their results did not change when removing Walmart from their portfolio.

When retrieving data for the identified companies from Datastream, we found a mismatch in some companies' industry classifications and reasons of exclusion. This implied further investigation and caused us to go thoroughly through all identified companies and correctly classify them.

Some companies went through M&A in the period of exclusion, implying that historically retrieved data could be obfuscated. These companies are identified and highlighted in section A2 in the Appendix.

4. Methodology

In this chapter, we will describe the methodology we have used to investigate the return of the excluded companies. First, we will start with a presentation of the capital asset pricing model ("CAPM") that is the fundament of the multifactor models used in this thesis. As the GPFG almost exclusively relies on publicly traded securities, at the same time being constrained to low deviations (i.e., the tracking error limit) from the benchmark portfolio, the CAPM and extended factor models which measure performance relative to a benchmark, capture this management style. We will present the Fama-French five-factor model, which adds various company-specific risk factors to the fundamentals of CAPM (Hayes, 2020). This model is used in our analysis to compute alphas and investigate superior performance. At the end of the chapter, we will explain the tests we have performed to ensure robustness in our results and discuss potential weaknesses regarding the applied regression model.

4.1 Testing Methodology

4.1.1 Cumulative returns

A simple way to compare the returns of two portfolios is using the geometric mean return, also called time-weighted return. This methodology is in line with GPFG's own performance results calculations, where the Fund claims to follow the Global Investment Performance Standard (NBIM, 2022d; GIPS, 2011).

The geometric mean return puts fitting weights according to the duration of the sub-period and assumes that all cash distribution is reinvested into the portfolio. These returns are geometrically linked to calculate the cumulative return, by using the following equation:

$$CR_{p,t} = \prod_{t=1}^{T}\left(1 + r_{p,t}\right) \qquad (4.1)$$

Where

$CR_{p,t} =$ Cumulative return for portfolio p at month t

$r_{p,t} =$ Portfolio return for portfolio p at month t

The comparison of cumulative returns of two portfolios should not be used to argue about expected return differences. To formally make a return comparison between portfolios it is necessary to further account for risk differences through a performance estimation in the setting of an asset pricing model.

4.1.2 CAPM and Jensen`s Alpha

CAPM describes a linear relationship between systematic risk and expected return (Bodie et al. 2011). The model is used in financial modeling due to its accuracy and insight (Bodie et al. 2011). The rationale of the CAPM is that investors should get higher returns as compensation for higher systematic risk[19], as this risk cannot be diversified.

All expected returns should present an alpha of zero if the CAPM holds (Mullins Jr., 1982). A continuation of the CAPM is Jensen's Alpha (hereafter referred to as "alpha"), which represents the average return on a portfolio or investment in excess of what is predicted by the CAPM (Jensen, 1969). If an investment or portfolio performs significantly better (worse) than the market, the applied asset pricing model delivers a significant positive (negative) alpha. This is often referred to as abnormal or superior return. Alternatively, the alpha represents a pricing error if incorrect factors are being used or if constant betas are employed in the model instead of time-varying betas (Jarrow & Protter, 2013). The CAPM and Jensen's alpha, i.e., a portfolio's return, are shown in equation 4.2:

$$r_{p,t} - r_{f,t} = \alpha_p + \beta_{mrkt}(r_{m,t} - r_{f,t}) + \epsilon_{p,t} \qquad (4.2)$$

Where

$r_{p,t} =$ Return on portfolio p at time t

$r_{f,t} =$ Risk free rate at time t

$\alpha_p =$ Jensen′s alpha, i. e. , the abnormal/superior return

$\beta_{mrkt} =$ Exposure to the market risk factor (often reffered to as market beta)

[19] Systematic risk is defined as the total risk that is caused by external factors which are not possible to control for a company or organization (CFI, 2022).

$r_{m,t} =$ Market return at time t

$\left(r_{m,t} - r_{f,t}\right) =$ Excess return of the market portfolio m

$\epsilon_{p,t} =$ Error term for portfolio p at time t

4.1.3 Fama-French Five-Factor Model

Since the development of CAPM, studies have found that other factors besides the market risk are priced in the cross section of returns. A financial multifactor model analyzes the relationship between several risk factors and the return on a portfolio (Bodie et al. 2011).

Fama and French (1993) presented a three-factor model expanding the CAPM with two additional factors, which was believed to be significantly more robust than the CAPM. The duo argued that the size (SMB) and value (HML) represented risk factors that were not captured by the CAPM's market beta, and that have historically outperformed the market. Fama and French expanded their three-factor model in 2014 by adding two new factors: a profitability factor (RMW) and an investment factor (CMA) (Fama & French, 2014a).

To make sure that any performance differences is not purely driven by different loadings on these risk factors, we add these factors to our market model. Additionally, in accordance with Blitz and Fabozzi (2017), we replace the risk-free rate on the left-hand side from the CAPM in equation 4.2, with the return of the respective market or sector index. This is done to analyze our portfolio's return in excess of the market/sector return. Further, as recommended by Dahlquist et al. (2015), we will use the global version of the Fama and French five-factor model and measure the excess return relative to GPFG's equity benchmark. Hence, we will on the right-hand side use the FTSE Global All Cap Index as the market portfolio return, as this index is used to construct GPFG's own equity benchmark (NBIM, 2021c).

The five-factor model used in our regressions can therefore be expressed in the following way:

$$r_{p,t} - r_{m,t} = \alpha_p + \beta_{mrkt}\left(r_{M,t} - r_{f,t}\right) + \beta_1 SMB + \beta_2 HML + \beta_3 RMW + \beta_4 CMA + \epsilon_t \quad (4.3)$$

Where

$r_{m,t} =$ Return on the market or sector index $r_{m,t}$ at time t

$r_{M,t}$ = Return on the FTSE Global All Cap index $r_{M,t}$ at time t

$\beta_1, \beta_2, \beta_3, \beta_4$ = Factor coefficients

SMB, HML, RMW, CMA = Fama French risk factors

The size factor (SMB) is short for "small minus big". SMB is the return spread[20] of small minus large stocks (Fama & French, 2022b).

The value factor (HML) is short for "high minus low". HML is the return spread of high book-to-market stocks (value stock) minus low book-to-market stocks (growth stocks) (Fama & French, 2022b).

The profitability factor (RMW) is short for "robust minus weak". RMW is the return spread of the most profitable firms minus the least profitable (Fama & French, 2022b).

The investment factor (CMA) is short for "conservative minus aggressive". CMA is the return spread of firms of a diversified portfolio of low investment companies in excess of the return on a diversified portfolio of high investment companies (Fama & French, 2022b).

4.2 Model Testing

To check that the coefficients in our regressions are effective and unbiased, we applied the ordinary least squares method. This is to control for the factors impact on the portfolio return as a response variable. Ordinary least squares ("OLS") and multiple linear regression is used to estimate our portfolio's monthly excess risk premium against the market factor established in the CAPM, in addition to the multiple factors defined in the Fama-French five-factor model. This method calculates and minimizes the sum of the squared differences between the values we observe and our predicted values (Xlstat, 2022). OLS is illustrated in equation 4.4.

$$\sum_{t=1}^{n} \widehat{u_t^2} = \sum_{t=1}^{n} (y_t - \widehat{\beta_0} - \widehat{\beta_1} x_{t,1} - \ldots - \widehat{\beta_k} x_{t,k})^2 \quad (4.4)$$

[20] The return spread of a long-short investing strategy: long positions in stocks that are expected to appreciate and short positions in stocks that are expected to decline (Chen, 2020b).

Where

$y_t =$ Response variable

$x_k =$ Explanatory variable

$\widehat{\beta_0} =$ Estimated intercept

$\widehat{\beta_k} =$ Estimated coefficient

$\hat{u} =$ Error term

$k =$ Integer factor

$t =$ Time

$n =$ Number of observations

There are five Gauss-Markov assumptions that needs to be fulfilled for us to trust the results retrieved from the ordinary least squares regressions: i) linear parameters, ii) no perfect collinearity, iii) zero conditional mean, iv) homoscedasticity and v) no serial-/autocorrelation (Wooldridge, 2012). It is assumed that the first three assumptions are fulfilled.

Autocorrelation and heteroskedasticity in the error terms can create biased regression results and invalidate inference (Wooldridge, 2012). We therefore test the presence of autocorrelation and heteroskedasticity by conducting a Breush-Godfrey and Breush-Pagan test. Our regressions had occasional cases of autocorrelation, initially. For these regressions, we did a Cochrane-Orcutt transformation to adjust the regressions for this autocorrelation (Wooldridge, 2012). After the transformation, the new estimates showed no cases of autocorrelation. These final test results are shown in the Appendix.

Most real-world data is most likely heteroskedastic (Glen, n.d). One can still conduct ordinary least squares without homoscedasticity. The variance of the least squares estimates may be sufficiently small enough to obtain precise estimates, in the cases where the sample size is large enough. We set our significance level at 5% for the heteroskedasticity test. The results for the tests indicate that autocorrelation is not a concern in our models and can be found in the Appendix.

To summarize, all five Gauss-Markov assumptions are satisfied, and we can use the OLS regression without any further adjustments, tests, or restrictions. In addition to the five Gauss-

Markov assumptions, stationarity in the time series is an important precondition when analyzing this type of data. A time series process is stationary if the probability distribution is stable over time (Wooldridge, 2012). If our time series data does not fulfill this requirement, the results may be spurious. We test for stationarity by running an augmented Dickey-Fuller test for unit root. The results from the tests indicate that we do not need to worry about non-stationarity in our data.

4.3 Model Weaknesses

The biggest weakness regarding model choice is that including risk factors is not necessarily a risk adjustment, because it is uncertain whether these factors are idiosyncratic[21] mispricing or actual risk[22]. In our case, factor analysis is an alternative to a comparable analysis where you make an "apples to apples" comparison: finding two or three companies that are otherwise similar to each of our excluded companies but have not been excluded of the GPFG. By using the Fama-French five-factor model we are unable to capture any firm-specific effects.

The Fama-French five-factor model has also received additional criticism throughout the years. Blitz, Hanauer and Van Vliet (2018) argued that adding more explanatory variables to a model is always risky. Fama and French (2014b) emphasized this issue themselves, referring to the fact that the value factor can become redundant when the profitability and investment factors are included. If the purpose is to estimate abnormal returns, the model performs similarly well with and without the value factor. We have therefore chosen to use the five-factor model in our thesis.

[21] Idiosyncratic risk is defined as a type of investment risk that is endemic to an individual asset (e.g., company's stock), a group of assets (e.g., sectors), or in some cases a very specific asset class (e.g., mortgage obligations) (Chen, 2022c).

[22] We refer to A Census of the Factor Zoo by Harvey & Liu (2019)

5. Analysis and results

In this chapter we present the results of our analysis, seeking to answer our main research question:

Do the excluded companies of the GPFG deliver superior excess returns, and where, when, and why are these returns created?

In the first section, we will start by visualizing the number of excluded companies throughout our sample period. Furthermore, we will present how the sub-portfolios performed through descriptive statistics. Thereafter, the cumulative excess returns of the portfolios are presented. In the last section, we will present the regression results. The analysis is followed by a discussion in chapter six, where the findings are discussed in relation to the thesis' main research question, sub-questions, and previous research.

5.1 Descriptive analysis

5.1.1 Portfolio Overview

Figure 5.1: Excluded companies within markets and exclusion criteria

Figure 5.1 illustrates the annual accumulated number of excluded companies in markets and exclusion criteria in our selected period September 2005 to August 2022. The numbers are adjusted by removing revoked companies. The first exclusions in developed markets happened in 2005, and later in 2007 for emerging markets.

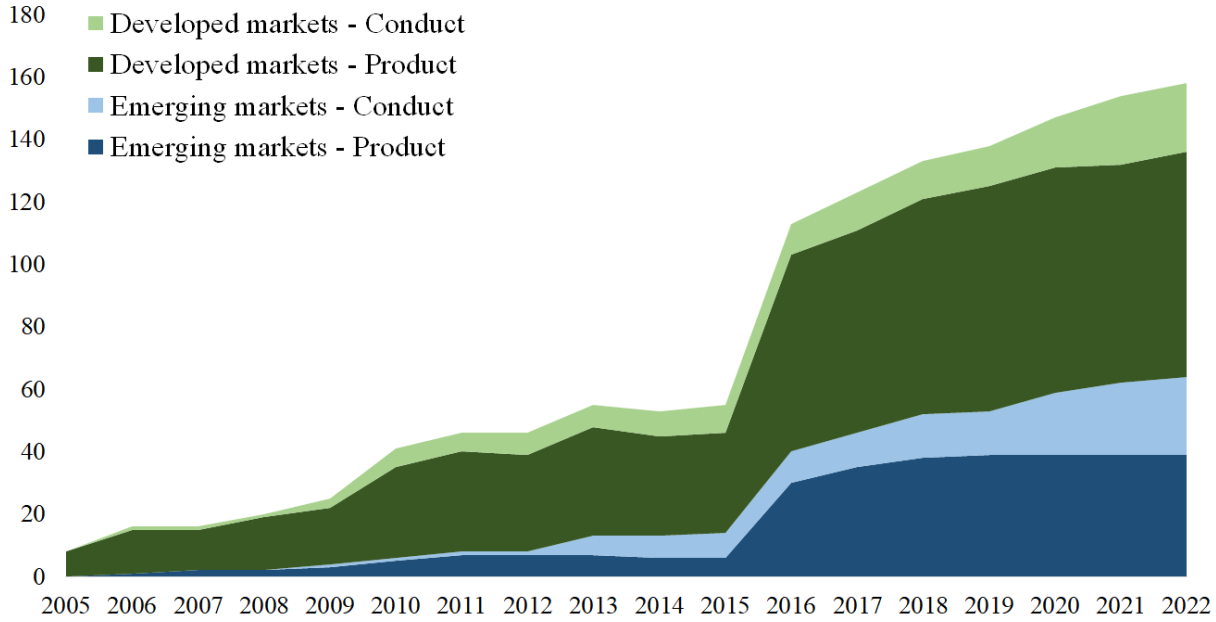


Figure 5.2: Excluded companies within the economic sectors

Figure 5.2 illustrates the annual accumulated number of excluded companies within each economic sector. Our analysis excludes sectors with less than 10 companies. Thus, we do not include Healthcare, Technology, Financials, and Real estate.

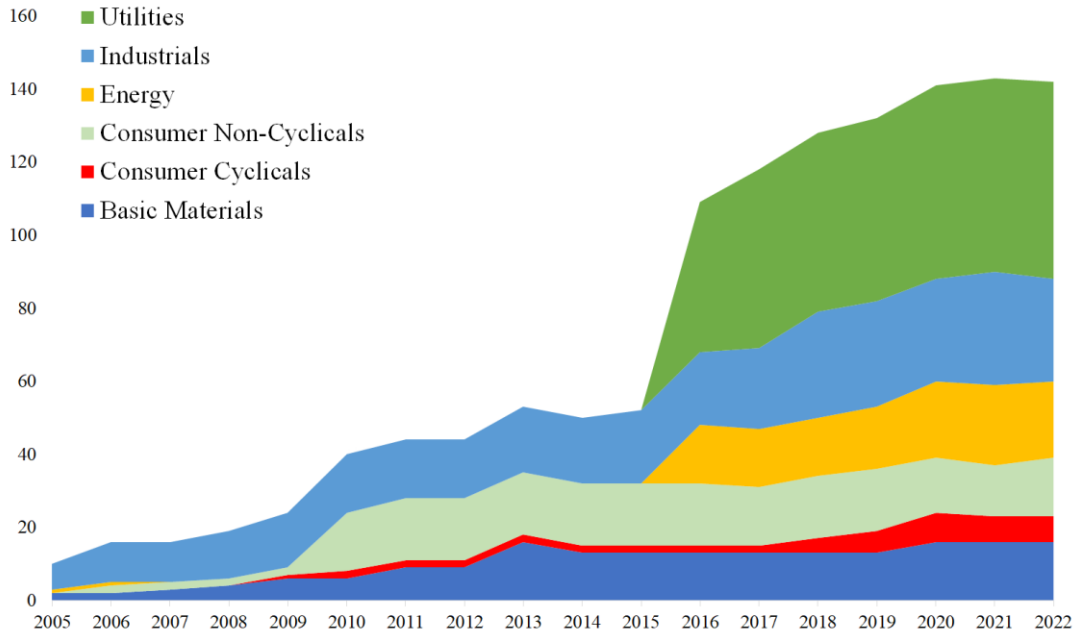


Figure 5.3: Excluded companies based on reasons of exclusion

Figure 5.3 illustrates the annual accumulated number of excluded companies based on its reason for exclusion. Only the six largest categories with more than five companies excluded are illustrated.

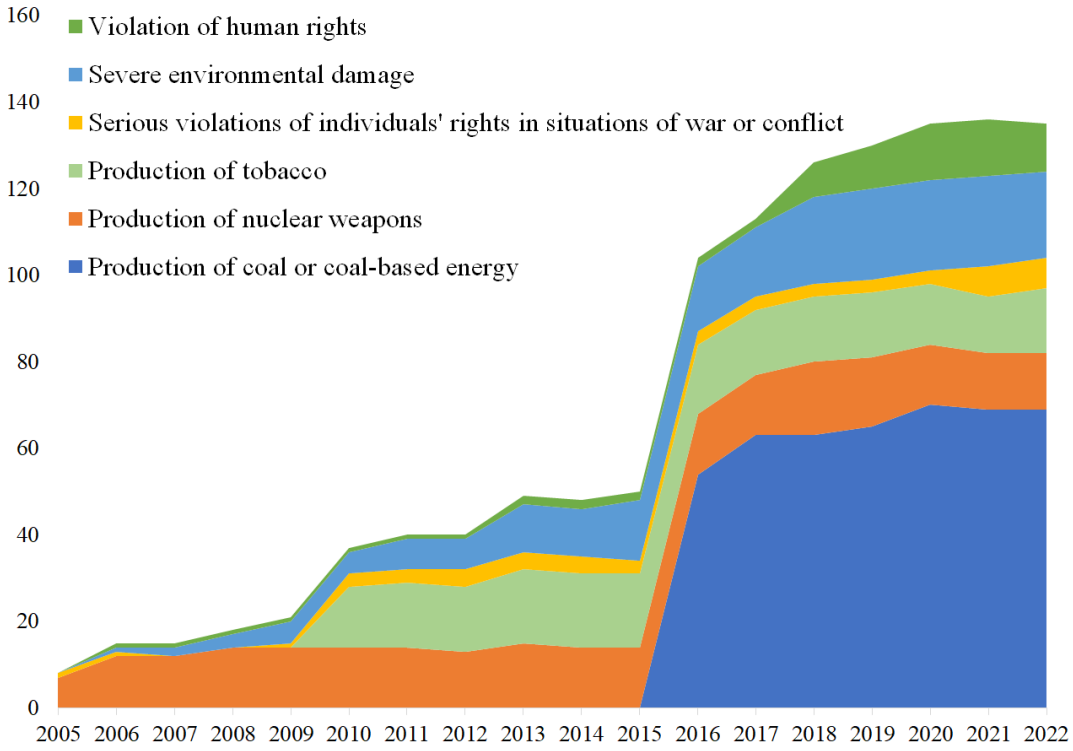


Figure 5.1 shows that the number of exclusions has increased since the beginning of practicing ethical guidelines, with a particularly steep increase between the years 2015 to 2016. This is not surprising, as figure 5.3 illustrates the implementation of excluding companies based on production of coal in 2016. This reason for exclusion caused the total portfolio to increase by 53 companies. At this time, this implied a 90% increase in the total number of excluded companies. These exclusions are found in the product portfolio in both markets and is furthermore visible in both the Utilities- and Energy sectors portfolios in figure 5.2.

Secondly, we can see that conduct-based exclusions have increased in size. This can possibly be viewed in line with the increased awareness of ESG in the ethical guidelines in recent years. One example, is the increase in companies excluded based on violation of human rights, as shown in figure 5.3. Another example is the serious violations of individual rights in situations of war and conflicts. This reason of exclusion consists of 70% Israeli companies, which are based on activities in occupied areas such as the West Bank (Council on Ethics, 2009; Council on Ethics, 2021b).

As for the other sectors, the Consumer Non-Cyclicals sector consists mostly of tobacco-companies, where most of these exclusions took place in 2010. Approximately 50% of the Industrials sector portfolio consists of exclusions based on the reason of production of nuclear weapons. Exclusion based on production of nuclear weapons constituted the first of the Fund's exclusions in 2005 and is therefore prominent in the early years. The Consumer Cyclicals and the Basic Materials sector consists of several different companies, both in terms of exclusion criteria and reasons.

To summarize, the distribution of reasons and criteria for exclusion and the focus of the ethical guidelines has changed throughout the years. However, these figures do not say anything about the size of the excluded companies (market capitalization) or return distribution. Hence, it is interesting to furthermore investigate these areas.

5.1.2 Descriptive statistics

5.1.2.1 Return distribution

Table 5.1: Descriptive statistics for portfolio returns

Table 5.1 illustrates the annual geometric mean return of the exclusion sub-portfolios and their respective market value-weighted index. The FTSE Global All Cap index is shown to illustrate how the exclusion portfolios has done relatively to the market value-weighted global index the GPFG uses to construct their own equity benchmark index. The geometric mean return is calculated as follows: $AR = [\prod_{t=1}^{T}(1 + r_i)]^{\frac{1}{T}} - 1$, where r_i is the annual returns and T are number of excluded years of the respective sub-portfolio. The minimum (maximum) values are the smallest (largest) annual return over each portfolio's timespan. The table also includes each portfolio's standard deviation. All return data are retrieved from Datastream.

Portfolio return distribution				
	Total exclusion period			
Market Portfolios	**Mean**	**Min**	**Max**	**St.dev**
FTSE Global All Cap	6.3 %	-17.6 %	37.0 %	18.8 %
FTSE Developed Markets	6.4 %	-48.8 %	32.5 %	18.3 %
Developed markets portfolio	**14.7 %**	**-22.9 %**	**34.6 %**	**14.3 %**
FTSE Emerging Markets	2.4 %	-54.9 %	85.2 %	30.9 %
Emerging markets portfolio	**18.4 %**	**-48.5 %**	**348.6 %**	**88.5 %**
	Total exclusion period			
Sector Portfolios	**Mean**	**Min**	**Max**	**St.dev**
FTSE World Basic Materials	4.0 %	-52.2 %	74.4 %	28.6 %
Basic Materials portfolio	**12.9 %**	**-78.0 %**	**146.2 %**	**52.0 %**
Refinitiv Global Cyclical Consumer Goods and Services	5.3 %	-44.3 %	42.8 %	22.3 %
Consumer Cyclical portfolio	**13.1 %**	**-46.0 %**	**44.3 %**	**23.3 %**
MSCI World Non-Cyclicals	5.8 %	-48.6 %	39.4 %	22.1 %
Consumer Non-Cyclical portfolio	**10.3 %**	**-19.9 %**	**27.2 %**	**12.8 %**
FTSE World Energy	3.7 %	-27.9 %	34.3 %	20.3 %
Energy portfolio	**15.4 %**	**-16.4 %**	**69.3 %**	**23.5 %**
FTSE World Industrials	5.4 %	-19.3 %	34.7 %	20.5 %
Industrials portfolio	**11.4 %**	**-5.2 %**	**74.6 %**	**22.8 %**
FTSE World Utilities	7.6%	1.9 %	20.7 %	9.0 %
Utilities portfolio	**11.7 %**	**2.6 %**	**25.7 %**	**9.1 %**

Table 5.1 presents the descriptive statistics of the exclusion portfolios, the respective indices, and the FTSE Global All Cap Index used by the GPFG. The table indicates that the emerging markets portfolio generated the highest average annual return of all portfolios over the total exclusion period. As one might expect, the statistics show that the emerging markets portfolio held the most extreme maximum and minimum annual returns, in addition to the highest standard deviation. This is in line with emerging markets being more volatile and riskier as

investments due to several reasons, such as unstable governments and political unrest, economic risk, unregulated markets, and unsound monetary policies (Ameriprise Financial Services, n.d).

When looking closer at the sector portfolios, the average returns are remarkably similar. There is, however, more variation when looking at the minimum, maximum, and standard deviation. We see that the Basic Materials portfolio holds both the lowest and highest values, in addition to the highest standard deviation. This implies that the excluded companies' returns in this sector are most volatile and thus have the highest risk. This sector portfolio has the largest variety both in terms of reasons for exclusion and types of companies excluded, as pointed out in section 5.1.1, which might explain these results. The Utilities sector portfolio has the lowest range of observed returns and is the only portfolio with exclusively positive annual returns. Though, 52 out of 55 companies in this portfolio are excluded based on coal and are presumably operating in the same or similar industries. These coal companies' returns are most likely closely linked and could explain the shorter range of distribution and the positive returns.

In sum, we see that all the exclusions sub-portfolios have higher annual average return than both their respective index and the GPFG's own benchmark.

5.1.2.2 Market capitalization

Table 5.2: Descriptive statistics of excluded companies' market capitalization

Table 5.2 shows monthly market capitalization of the excluded companies within each sub-portfolio: the arithmetic mean, minimum, maximum, median, and standard deviations. The table also show descriptive statistics of the FTSE Global All Cap index to illustrate how the market capitalization varies in this index compared to our sub-portfolios. However, this only gives an illustration of the differences as these numbers are based on how the global index was constructed in November 2022. We retrieved this data from FTSE Global All Cap Factsheet and were not able to retrieve any data on standard deviation. The other values are calculated based on retrieved data from Datastream. All values are in USD billion.

Market Capitalization Excluded Companies (Billion USD)					
	Total exclusion period				
	Mean	**Min**	**Max**	**Median**	**St.dev**
FTSE Global All Cap	**6.90**	**0.00**	**2,261.33**	**0.90**	
Market Portfolios	**Mean**	**Min**	**Max**	**Median**	**St.dev**
Developed markets portfolio	23.80	0.00	315.80	3.10	58.80
Emerging markets portfolio	6.70	0.03	119.30	1.90	12.20
	Total exclusion period				
Sector Portfolios	**Mean**	**Min**	**Max**	**Median**	**St.dev**
Basic Materials portfolio	15.90	0.03	119.30	5.50	22.10
Consumer Cyclicals portfolio	24.20	0.10	161.40	4.10	39.40
Consumer Non-Cyclicals portfolio	47.80	0.00	315.80	12.80	65.20
Energy portfolio	6.40	24.00	77.20	3.20	9.70
Industrials portfolio	18.40	0.19	120.70	9.10	22.50
Utilities portfolio	8.10	0.04	41.10	4.10	8.80

The descriptive statistics in table 5.2 show that the average market capitalization ("market cap") differs considerably across the FTSE Global All Cap index, markets, and sectors. The average market cap in our exclusion portfolios is in the interval of USD 6.4 to 47.8 billion. Additionally, the standard deviation varies between USD 8.8 to 65.2 billion. Likewise, we can see that the companies included in the FTSE Global All Cap index varies, but to a greater extent. The highest market cap in the index is USD 2 261.3 billion and the median is USD 0.9 billion. These results are not surprising as this market index consist of approximately 9 500 companies with a wider range of characteristics compared to our total exclusion portfolio consisting of only 176 companies.

We can see that the Consumer Non-Cyclicals sector have highest average of the six sectors, as well as holding the companies with the highest and lowest market cap. The median value

for all sub-portfolios tells us that most of the observed returns are closer to the minimum values, implying that presumably a few companies with higher market caps are weighing up the average. The exclusion of Walmart Inc is one example of this in the Consumer Non-Cyclicals sector, as this company historically[23] holds the highest market cap in the total exclusion portfolio of USD 315.8 billion. From figure 5.3 we could see that companies excluded based on tobacco were one of the overrepresented reasons for exclusion, which all belong to the Consumer Non-Cyclicals sector. However, these tobacco companies are overall small-cap[24] companies, which should not have such a large impact on the total value of the market value-weighted portfolio.

From the illustration in figure 5.3 we could see that the total exclusion portfolio is overrepresented by companies excluded based on coal. However, this illustration does not give an accurate picture of the weights these companies constitute in terms of market cap of the exclusion portfolio. The coal companies are undoubtedly the largest in terms of grounds for exclusion, however it is also one of the categories that consists of many small- to mid-cap companies. Most coal companies belong to either the Utilities or Energy sector, and these sectors are on average the smallest, with the lowest variation in market caps. In the Utilities sector, these coal companies are mostly mid-cap with a couple companies qualified as large-cap. In the Energy sector the coal companies are mostly mid-cap between USD 2 to 8 billion. The Energy sector also consists of a large fraction of E&P companies within the oil and gas industry, which are mostly large-cap. The Industrials sector consist mostly of the companies excluded based on production of nuclear weapons. These companies are mostly large-cap companies excluded at the beginning of the practise of ethical guidelines and more likely to have a greater impact on returns.

Despite the results from the descriptive statistics, we cannot conclude on anything based on these alone. That leads us to compare the exclusion portfolios' returns to their respective market or sector index. Furthermore, analyze the excess returns to the GPFG's own benchmark index and to control for different risk factors before concluding on potential differences in the risk-adjusted return.

[23] Walmart Inc was revoked in 2019

[24] Small-cap: USD 0.3 – 2 billion, Mid-cap: USD 2 – 10 billion, Large-cap: USD 10 > billion, (Jackson, 2022).

5.1.3 Excess returns

5.1.3.1 Cumulative excess returns of sub-portfolios

Table 5.3: Annual cumulative excess returns

Table 5.3 shows the annual cumulative excess returns in percentage of the excluded companies' sub-portfolios. The cumulative excess returns are calculated as: $CR_{p,t} = \prod_{t=1}^{T}(1 + (r_{p,t} - r_{m,t}))$, where $r_{p,t} - r_{m,t}$ is the excess return of the exclusion portfolio, and $r_{p,t}$ is the market value-weighted return of portfolio p in year t minus the market value-weighted return of the respective market/sector index m in year t. We let a stock enter the exclusion portfolio the month after the company has been excluded of the GPFG. If an exclusion is revoked, the stock leaves the exclusion portfolio at the end of that month, and thus not included on the portfolio's return. The grey areas means that there were no excluded companies within this sub-portfolio in this year. Green represents positive excess returns (the portfolio did better than the comparable index), yellow represents no excess returns (the portfolio and market did as good/bad, thus no change in cumulative returns), and red represents negative excess returns (the portfolio did worse than the index). All return data is retrieved from Datastream.

Year	Developed Markets	Emerging Markets	Basic Materials	Consumer Cyclicals	Consumer Non-Cyclicals	Energy	Industrials	Utilities
2005	117%						96%	
2006	118%		94%	107%	84%		99%	
2007	126%	78%	121%	148%	84%		99%	
2008	163%	83%	62%	149%	175%		116%	
2009	164%	213%	88%	145%	113%		107%	
2010	172%	324%	106%	168%	117%	79%	94%	
2011	205%	395%	106%	194%	163%	99%	110%	
2012	205%	441%	111%	197%	155%	101%	112%	
2013	207%	434%	114%	219%	137%	91%	150%	
2014	212%	464%	113%	235%	145%	122%	158%	
2015	230%	519%	104%	242%	150%	188%	193%	
2016	250%	547%	152%	267%	151%	148%	197%	105%
2017	269%	546%	162%	291%	151%	169%	233%	107%
2018	273%	591%	174%	292%	135%	163%	264%	112%
2019	274%	574%	248%	317%	126%	137%	263%	105%
2020	252%	607%	355%	295%	102%	173%	217%	103%
2021	255%	856%	402%	257%	102%	219%	229%	115%
2022	323%	1136%	473%	317%	138%	237%	276%	123%

For our two investigated markets, we can see indication of the exclusion portfolio in developed markets portfolio having a steadily annual increase in returns. It seems that the exclusion portfolio in developed markets increased the most during the first sub-period, 2005-2016. Additionally, when taking a closer look at the years of the two large crises in our timespan, the financial crisis and the pandemic, it is only the latter crisis which had negative returns.

Emerging markets shows other tendencies. It seems the excess returns are larger in size and more volatile. This agrees with our results of returns and standard deviation in table 5.1. Moreover, we observe that the cumulative excess return of the emerging markets portfolio has increased considerably after the pandemic. This can probably be related to the 84% increase of companies excluded within the conduct-criterion in 2020 and 2021 as shown in figure 5.1, especially due to the claims of severe environmental damage visible in figure 5.3. Moreover, we can see that the exclusion portfolio in emerging markets has the highest cumulative excess return over the whole timespan and is seemingly the portfolio that stands out the most in terms of return differences of all our exclusion portfolios.

Considering it is the sector portfolios that will capture any sector-specific effects, it is particularly interesting to look more closely at these portfolios. We can see that the returns of the sector portfolios show different results.

Table 5.1 showed that the Consumer Non-Cyclicals portfolio sector is the single sector with both higher average return and lower standard deviation compared to their respective sector index. The excess returns show that the Consumer Non-Cyclicals sector seemingly had most periods with underperformance relative to their index of all the sectors. As pointed out in sub-section 5.1.1, this sector mostly consists of tobacco companies.

We can see that all sectors included during the financial crisis seemingly underperformed in one of the two years compared to their index. In the pandemic, all the sector portfolios besides the Basic Materials and Energy sector visibly underperformed their sector index. To all appearances, from the cumulative excess returns it seems like the exclusion portfolio in the Industrials sector experienced the biggest decrease in returns when the pandemic hit out of all the sector portfolios. This sector mostly consists of industries which most likely experienced either production stops or negative shocks in demand during this period[25]. As the exclusions of the GPFG often are industry-specific screens, these observations contradict with “sin stocks” typically being recession-resistant (Chen, 2020a).

In our second sub-period, 2017-2022, all exclusion portfolios except the Basic Materials portfolio seems to underperform in several years. In addition, it looks like the excluded companies within the Basic Materials sectors has had the best performance out of the six

[25] E.g., Aerospace & Defense (nuclear weapons) and Constructing & Engineering

sectors. Furthermore, our figure indicates a pattern where in general our sector portfolios underperform in several of the same years. Thus, it might be that the excluded companies are affected by the same trends or other common factors.

5.1.3.2 Excess returns in USD

Figure 5.4: Market value of the cumulative excess returns

Figure 5.4 shows the monthly market value of the cumulative excess returns of the sub-portfolios from 2005 to 2022. This is calculated as: $MV_{p,t} = [\prod_{t=1}^{T}(1 + (r_{p,t} - r_{m,t}))]\ x\ MC_{p,t}$, where $r_{p,t} - r_{m,t}$ is the excess return of the exclusion portfolio, the market value-weighted return of portfolio p in month t minus the return of the respective market/sector index in month t, and $MC_{p,t}$ is the market capitalization of the exclusion portfolio p in month t. All return and market cap data is retrieved from Datastream. All values are in USD billions.

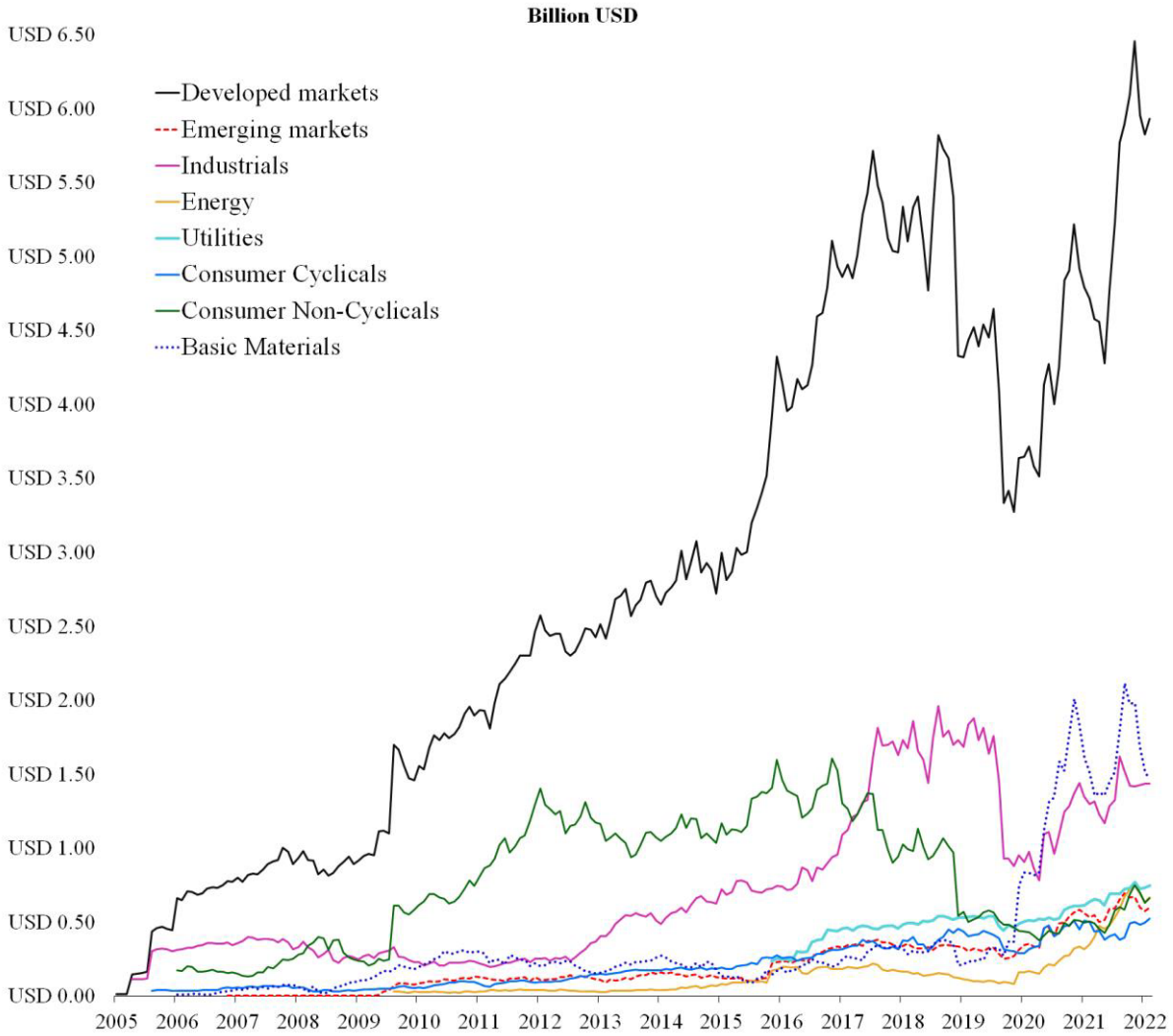


Figure 5.4 shows the market value of the cumulative excess returns of the sub-portfolios' over the period of exclusionary screening. We see that the developed markets portfolio has been the largest in market value, which are expected as the largest number excluded companies are within this portfolio. The descriptive statistics in table 5.2 showed that companies in developed

markets are considerably larger in size compared to the excluded companies within emerging markets. The steep increase in returns from 2015 to 2016 can probably be seen in connection with the exclusion of coal companies as highlighted in sub-section 5.1.1. During the two crises, the decline in the developed markets portfolio seems more prominent relative to the other sub-portfolios. However, as table 5.3 shows, the excluded companies in developed markets seemingly outperformed their market index. The figure indicates that the market value of the cumulative excess returns in developed markets was approximately USD 6 billion in the end of our timespan.

The portfolio in emerging markets shows a more moderate increase in market value over the timespan, less than USD 1 billion. This could be explained by the observed market caps in table 5.2, which showed that the average market cap for excluded companies in emerging markets are in general much smaller than the ones in developed markets and most sectors.

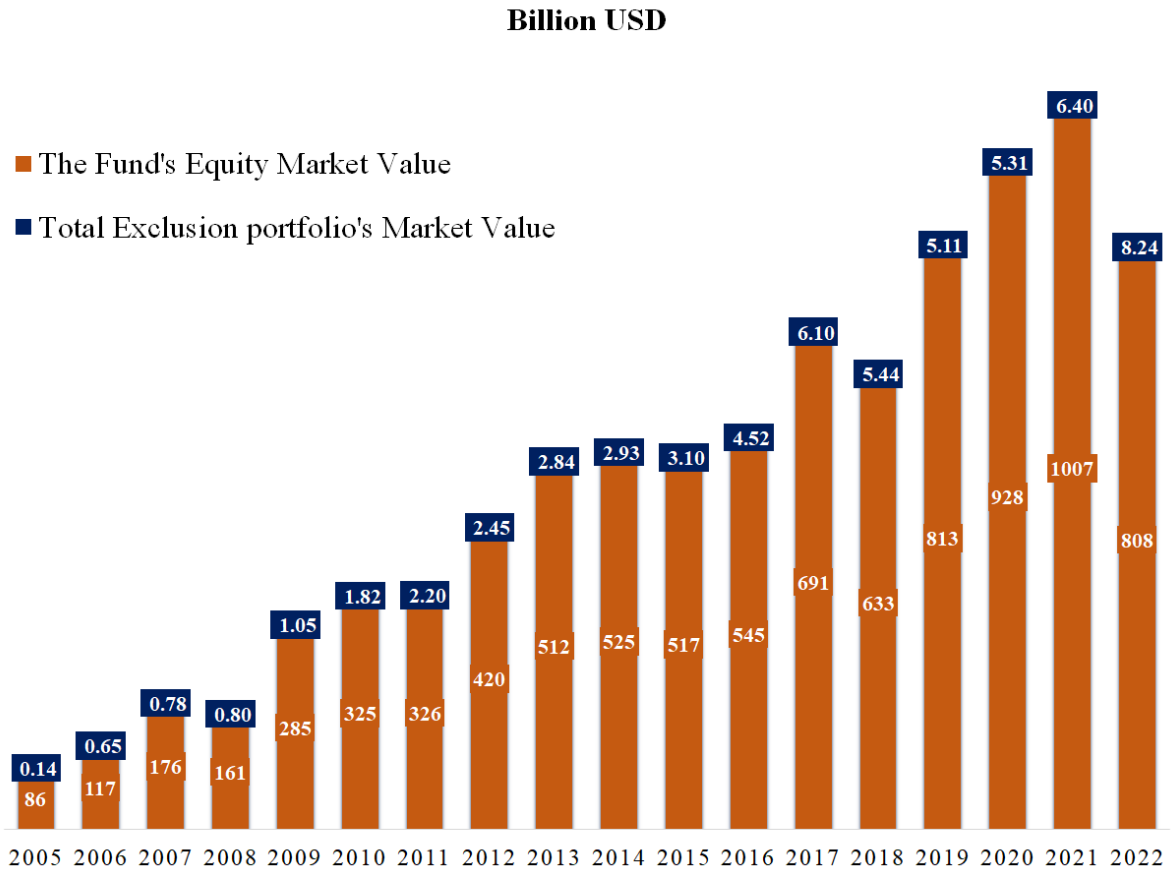
Of the sector portfolios, the Consumer Non-Cyclicals sector has seemingly had the highest market value in the first sub-period but are prominent declining in 2019. This sudden decline can probably be explained by Walmart Inc being revoked in 2019. However, in the second and most recent sub-period, the Basic Materials and Industrials sectors seem to have had a substantial increase in market value. The steep increase in the Industrial sector can probably be viewed in context of the increased exclusions of different types of companies in this sector from 2017, which has increased the total market cap. Similarly, the observed increase in market value in 2020 in the Basic Materials sector may be explained by the exclusion of five new companies. Where the exclusion of Vale SA at that point and currently is the biggest excluded company within Basic Materials and in emerging markets.

Altogether, it seems all the sub-portfolios has had an increase in market value over the timespan. However, these values say nothing about the relative importance of the increase in market values compared to the Fund itself, and thus the financial cost of the GPFG.

5.1.3.2 The GPFG's cost of exclusionary screening

Figure 5.5: Market value of total exclusion portfolio and the Fund's equity portfolio

Figure 5.5 shows the annual market value of the cumulative excess return of the total exclusion portfolio, i.e., all excluded companies (blue), and the market value of the GPFG's equity portfolio (orange) at years end from 2005 to 2022. Thus, the blue box represents the accumulated monetary loss for the GPFG of exclusionary screening. The exclusion portfolio's market value is calculated as: $MV_{p,t} = [\prod_{t=1}^{T}(1 + (r_{p,t} - r_{m,t}))]\ x\ MC_{p,t}$, where $r_{p,t} - r_{m,t}$ is the excess return, calculated as the market value-weighted return of portfolio p in year t minus the return of the respective market/sector index in year t, and $MC_{p,t}$ is the total market capitalization of the total exclusion portfolio p in year t. All return and market cap data is retrieved from Datastream. The Fund's Equity portfolio's market value is calculated based on the first half of 2022 and retrieved from the Norges Bank Investment Management's website (NBIM, 2022a). All market values are in USD billion.



We can see that the market value of the excluded companies makes up a small amount of the total market value of the GPFG, both over the whole timespan and especially in recent years. This is probably due to the GPFG's investment universe and assets has grown considerably. The market value of the Fund's equity investments is USD 808 billion, and the investment universe consist of over 9 000 companies (NBIM, 2022a). Our portfolio of the excluded companies of the GPFG, on the other hand, consists of 176 companies. The proportion of excluded companies in our portfolio amounts to only around 2% of the Fund's own investment universe.

It seems like the Fund since the inception of exclusionary screening has had a total loss of approximately USD 8.24 billion[26], which makes up approximately 1% of the Fund's equity market value. In other words, for a large institutional investor like the GPFG, this accounts for a very small fraction of total fund value. Thus, for Norway's GPFG, it seems possible to exclude whole industries and companies violating with ethical norms without affecting returns noteworthy.

5.2 Factor regression results

While the descriptive analysis allows a first assessment of the performance of the exclusion portfolios, they do not account for different exposures to risk. In this section, we present the results of our performance regressions.

As previously mentioned, the objective of this thesis is to analyze if excluded companies of the GPFG's investment universe deliver superior excess returns and how these may be explained. To achieve this, we estimate alphas using the Fama-French five-factor model. If alpha estimates from these regressions show a positive and significant estimate it indicates that the exclusion portfolios outperform the GPFG's equity benchmark. Thus, excluding these companies from the GPFG's investment universe has financially hurt the Fund. Our result from sub-section 5.1.3 suggests that the Fund had a total loss of USD 8.24 billion in our investigated period. If we find no significant performance difference, we can conclude that the GPFG can meet their obligations as a responsible investor without sacrificing returns. We start off by examining developed and emerging markets, before analyzing economic sector affiliation of the excluded companies.

[26] Our presented numbers are quite similar with previous number presented on the Fund's loss of exclusionary screening from 2006-2020 (NBIM, 2020c). We also note that these numbers are affected by the methodological choice.

5.2.1 Markets

5.2.1.1 Sub-periods

Developed markets

Table 5.4: Estimates of annualized alpha of sub-periods in developed markets

Table 5.4 reports estimates of the Fama-French five-factor model regression, $(r_{p,t} - r_{m,t}) = \alpha_p + \beta(r_{M,t} - r_{f,t}) + b^{SMB}SMB_t + b^{HML}HML_t + b^{RMW}RMW_t + b^{CMA}CMA_t + \varepsilon_t$. The dependent variable, $(r_{p,t} - r_{m,t})$, are the monthly return of the developed markets exclusion portfolio minus the FTSE Developed markets index monthly returns. $r_{f,t}$ is the risk-free rate, SMB, HML, RMW, CMA are the Global Ken French factors. The explanatory variable $r_{M,t} - r_{f,t}$ (Rm-Rf) is the FTSE Global All Cap index (used as the basis for the equity benchmark of the GPFG) minus the risk-free rate. The exclusion portfolios are constructed from shares excluded from the GPFG's investment universe. All portfolios are market value-weighted with monthly data from 2005 to 2022. Observations are the number of months in each exclusion sub-portfolio. The asset pricing factors used for all regressions in this section are from Ken French's data page: SMB (small minus big) captures the portfolio's exposure to small market cap stocks. HML (high minus low) captures the portfolio's exposure to high book-to-market stocks. RMW (robust minus weak) captures the exposure to companies with robust profitability. CMA (conservative minus aggressive) seizes the exposure to a conservative investment strategy. Standard errors in parenthesis are Newey-West adjusted. Annualized alphas are calculated from monthly alphas as $Annual\ \alpha = (1 + \alpha_i)^{12} - 1$. Significance levels are indicated as: $* p < 10\%$, $** p < 5\%$,$*** p < 1\%$.

	2007 - 2022	**2007 - 2016**	**2017 - 2022**
Alpha	0.005***	0.007***	0.005**
	(0.002)	(0.002)	(0.002)
Rm-Rf	-0.138***	-0.148***	-0.069
	(0.036)	(0.046)	(0.058)
SMB	-0.303***	-0.452***	-0.209
	(0.100)	(0.120)	(0.169)
HML	0.169*	-0.116	0.237
	(0.097)	(0.130)	(0.153)
RMW	0.347**	0.353*	0.053
	(0.143)	(0.195)	(0.204)
CMA	0.433***	0.266	0.547**
	(0.136)	(0.164)	(0.230)
Annualized Alpha	**6.5%**	**8.2%**	**6.0%**
Adj. R^2	0.323	0.320	0.529
Observations	206	138	68

Firstly, the five-factor model estimates positive and significant alphas for all periods of the developed markets portfolio. The three alpha estimates are almost identical, and the same size as those of Berle et al. (2022) estimated. The alpha of the total period, 2005-2022, is 6.5% annualized and significant on a 1% level, the first sub-period, 2005-2016, is 8.2% annualized and significant on a 1% level, while the latest period, 2017-2022, is 6.0% annualized and significant on a 5% level. Our results are in line with what we found in table 5.3, where the

exclusion portfolio in developed markets increased the most during the first sub-period. Worth mentioning, is that the number of observations (months) for the latter period are less than half the observations of the former, which can influence the results. However, 68 observations should still be enough to get adequate statistical power (Wooldridge, 2012). Based on the performance results we can therefore conclude that the excluded companies in the developed world deliver a premium relative to the GPFG's equity benchmark, FTSE Global All Cap Index, over all periods.

Secondly, the table report estimates of the factor loadings. The market risk factor (Rm - Rf) are statistically significant at 1% for two out of three periods. Given the negative sign of the coefficient, the regression model suggests that the portfolio of excluded stocks in developed markets mostly consists of low-beta stocks relative to the market index used by the Fund.

Further, the size factor (SMB) captures the portfolio's exposure to small-cap stocks. The coefficient is negative for all periods, and statistically significant for the whole period and the first period. This implies that the total exclusion portfolio and the excluded companies in the first period in the developed markets are exposed to larger companies compared to the market. This substantiates the findings from the descriptive statistics in table 5.2 of the exclusion portfolio in developed markets having a higher average market cap than the global index. Additionally, we see that the whole timespan has a significant exposure towards the value factor (HML), which indicates that the total exclusion portfolio has a loading towards companies with a high book-to-market value.

The regression model shows that the first sub-period and the total period loads positively on the profitability factor (RMW), indicating that these portfolios consist of companies with robust profitability. The second sub-period and the total period have an exposure toward companies with a conservative investment strategy (CMA). These results can be viewed in connection with companies often reducing their investments if being negatively screened as the cost of capital rises. Companies being positively screened will, on the other hand, increase their investments (Johnsen, 2020). Hence, we would expect the excluded companies of the GPFG to have a positive exposure towards the investment factor.

Considering the differences in coefficient significance of the risk factors, the characteristics of the companies in developed markets in our data set seems to have changed during the timespan, illustrated in sub-section 5.1.1. However, based on the total portfolio having a

positive and significant exposure to large companies, value stocks, and companies with robust profitability, it seems like the portfolio in developed markets has had an overweight of companies with monopolistic features over the total timespan. It appears that the exclusions of companies producing nuclear weapons has played a decisive role, as these was the first companies excluded, and all these companies are within the Industrials sector and developed markets.

Finally, the explanatory power (Adj. R^2) is in the interval 32.0% to 52.9%, and the five-factor model seems to explain a somewhat part of the variation in the data set for the developed market.

Emerging markets

Table 5.5: Estimates of annualized alpha of sub-periods in emerging markets

Table 5.5 reports estimates of the Fama-French five-factor model regression, $(r_{p,t} - r_{m,t}) = \alpha_p + \beta(r_{M,t} - r_{f,t}) + b^{SMB}SMB_t + b^{HML}HML_t + b^{RMW}RMW_t + b^{CMA}CMA_t + \varepsilon_t$. The dependent variable, $(r_{p,t} - r_{m,t})$, are the monthly portfolio returns of the emerging markets exclusion portfolio minus the FTSE Emerging markets index monthly returns. $r_{f,t}$ is the risk-free rate, SMB, HML, RMW, CMA are the Global Ken French factors. The explanatory variable $r_{M,t} - r_{f,t}$ (Rm-Rf) is the FTSE Global All Cap index minus the risk-free rate. All portfolios are value-weighted with monthly data from 2007 to 2022. Observations are the number of included months in each exclusion sub-portfolio. Standard errors in parenthesis are Newey-West adjusted. Annualized alphas are calculated from monthly alphas as $Annual\ \alpha = (1 + \alpha_i)^{12} - 1$. Significance levels are indicated as: $* p < 10\%$, $** p < 5\%$,$*** p < 1\%$.

	2007 - 2022	**2007 - 2016**	**2017 - 2022**
Alpha	0.019**	0.028**	0.010***
	(0.007)	(0.011)	(0.003)
Rm-Rf	-0.205	-0.470*	-0.060
	(0.155)	(0.253)	(0.072)
SMB	-0.013	-0.201	-0.715***
	(0.447)	(0.694)	(0.200)
HML	0.544	0.485	0.172
	(0.422)	(0.730)	(0.201)
RMW	-0.254	-1.296	0.225
	(0.621)	(1.09)	(0.245)
CMA	-0.763	-1.741*	1.070***
	(0.595)	(0.988)	(0.268)
Annualized Alpha	**25.3%**	**39.3%**	**12.7%**
Adj. R^2	0.018	0.045	0.091
Observations	184	116	68

Our regression models show that the three periods in emerging markets deliver an annualized alpha between 12.7% to 39.3% in excess of the market. Based on these performance

regressions, we can conclude that the excluded companies of the GPFG in emerging markets deliver a premium relative to the GPFG's equity benchmark.

The market risk factors indicate that the exclusion portfolios of all three periods consist of low-beta stocks. However, the market factor is only significant for the second sub-period. A possible explanation for this finding, is that the excluded companies in this period belong to industries which are more predictable and stable than the overall market. This can be viewed in context of the increased exclusions of coal companies in the second sub-period within the Utilities sector with corresponding low betas.

For the latter period, 2017-2022, the tilt towards the size factor indicates that companies excluded in the last sub-period have been bigger in size. Additionally, the investment factor indicates that the first sub-period was significantly exposed to companies with an aggressive investment style, while the second sub-period was significantly exposed to companies with a conservative investment style. Thus, for the second period, it seems as these companies in a similar way as for developed markets, may have reduced their investments compared to the market after being negatively screened.

As highlighted in sub-section 5.1.1, the composition of excluded companies in the two sub-periods have changed considerably within emerging markets. 68% of companies in the first sub-period are coal companies under the product-criterion. The newest period, on the contrary, consists of an increased variety of companies within both product and conduct, and reasons within exclusion criteria. However, from our regression models, it is seemingly difficult to tell if the characteristics of the excluded companies have changed during our timespan or whether the companies are more alike. The more significant tilt towards larger and more conservative companies for the second sub-period may indicate that the excluded companies in recent time have had more common characteristics than the earlier period. Additionally, the exposure towards these two factors may indicate that companies in the recent sub-period have more monopolistic features, such as companies excluded within developed markets.

We note that the explanatory power for all three regression is considerably lower in emerging markets compared to the developed markets regressions. This might be expected as the FTSE Global All Cap index is used as the market portfolio. For example, in 2022, this index had only an exposure towards emerging markets of 9.5% (FTSE Russell, 2022). Thus, it might be

other unexpected factors apart from these Fama-French risk factors that may interfere in affecting the excluded companies' stock returns[27]. Thus, also the observed alphas.

5.2.1.2 Exclusion criteria

Developed markets

Table 5.6: Estimates of annualized alpha of exclusion criteria in developed markets

Table 5.6 reports estimates of the Fama-French five-factor model regression, $(r_{p,t} - r_{m,t}) = \alpha_p + \beta(r_{M,t} - r_{f,t}) + b^{SMB}SMB_t + b^{HML}HML_t + b^{RMW}RMW_t + b^{CMA}CMA_t + \varepsilon_t$. The dependent variable, $(r_{p,t} - r_{m,t})$, are the monthly returns of the exclusion criteria in the developed markets exclusion portfolio minus the FTSE Developed markets index monthly returns. $r_{f,t}$ is the risk-free rate, SMB, HML, RMW, CMA are the Global Ken French factors. The explanatory variable $r_{M,t} - r_{f,t}$ (Rm-Rf) is the FTSE Global All Cap index minus the risk-free rate. All the exclusion sub-portfolios are market value-weighted with monthly data from 2005 to 2022. Observations are the number of included months in each exclusion sub-portfolio. Standard errors in parenthesis are Newey-West adjusted. Annualized alphas are calculated from monthly alphas as $Annual\ \alpha = (1 + \alpha_i)^{12} - 1$. Significance levels are indicated as: $* p < 10\%$, $** p < 5\%$,$*** p < 1\%$.

	Product	**Conduct**
Alpha	0.005***	0.004
	(0.002)	(0.004)
Rm-Rf	-0.153***	-0.019
	(0.036)	(0.102)
SMB	-0.333***	0.144
	(0.103)	(0.286)
HML	0.125	0.796***
	(0.100)	(0.269)
RMW	0.381**	0.257
	(0.148)	(0.404)
CMA	0.561***	-1.146***
	(0.144)	(0.383)
Annualized Alpha	**6.0 %**	**5.4 %**
Adj. R^2	0.370	0.044
Observations	206	199

From presented literature in 2.2.1, one would expect that being invested in companies that violate ethical norms (conduct) may expose investors to different risk than investing in companies that operate in "sinful" industries (product). A large proportion of companies excluded under the product-criterion consist of stocks typically labeled as "sinful". For

[27] Unstable governments, political unrest, economic risk, insufficient labor and/or raw materials, high inflation or deflation, unregulated markets, and unsound monetary policies. Or other model weaknesses as pointed out in section 4.3.

example, weapons constitute 23% and coal 40% of the total product portfolio in developed markets. Thus, our analysis indicates that product-based exclusion in developed markets delivers a premium compared to the market and is therefore consistent with the literature on "sin" stocks (e.g., Hong and Kacperczyk, 2009; Fabozzi et al., 2008; Capelle-Blancard and Monjon, 2014).

There are, however, striking similarities between the two sub-portfolios annualized alpha estimates, 6.0% and 5.4%. These results differ from the presented literature on previous research of the GPFG, which found that exclusions based on conduct delivered superior returns, and these estimates were double those for the product (Berle et al., 2022). Both alpha estimates from our regressions are, on the other hand, quite identical to Berle et al.'s (2022) value-weighted alpha estimate of the total exclusion portfolio of 6.9%.

The two criteria have different exposure to the risk factors. The market risk factor is statistically significant and negative for the product-criterion. Additionally, this product portfolio has a significant negative exposure towards the size factor and loads positively and significantly on both the profitability and investment factor. These findings contradict with Blitz and Fabozzi (2017) concluding no abnormal returns related to "sin" investing when controlling for profitability and investment strategy. The conduct portfolio has a significant loading towards value stocks and is exposed to companies with an aggressive investment strategy. Thus, it seems as if the characteristics of the excluded companies based on the two criteria differ.

Lastly, the models explain a far greater part of the variation of the product- than conduct-based exclusions.

Emerging markets

Table 5.7: Estimates of annualized alpha of exclusion criteria in emerging markets

Table 5.7 reports estimates of the Fama-French five-factor model regression, $(r_{p,t} - r_{m,t}) = \alpha_p + \beta(r_{M,t} - r_{f,t}) + b^{SMB}SMB_t + b^{HML}HML_t + b^{RMW}RMW_t + b^{CMA}CMA_t + \varepsilon_t$. The dependent variables, $(r_{p,t} - r_{m,t})$, are the monthly portfolio returns of the exclusion criteria in the emerging markets exclusion portfolio minus the FTSE Emerging markets index monthly returns. $r_{f,t}$ is the risk-free rate, SMB, HML, RMW, CMA are the Global Ken French factors. The explanatory variable $r_{M,t} - r_{f,t}$ (Rm-Rf) is the FTSE Global All Cap index minus the risk-free rate. All the exclusion portfolios are market value-weighted with monthly data from 2007 to 2022. Observations are the number of included months in each exclusion sub-portfolio. Standard errors in parenthesis are Newey-West adjusted. Annualized alphas are calculated from monthly alphas as $Annual\ \alpha = (1 + \alpha_i)^{12} - 1$. Significance levels are indicated as: $* p < 10\%$, $** p < 5\%$,$*** p < 1\%$.

	Product	**Conduct**
Alpha	0.016**	0.015***
	(0.007)	(0.005)
Rm-Rf	-0.250	0.086
	(0.159)	(0.120)
SMB	-0.329	0.551
	(0.459)	(0.357)
HML	0.515	0.493
	(0.435)	(0.345)
RMW	-0.146	-0.022
	(0.640)	(0.468)
CMA	-0.709	-0.129
	(0.615)	(0.518)
Annualized Alpha	**21.0%**	**19.6%**
Adj. R^2	0.019	0.078
Observations	186	155

In emerging markets, the product and conduct portfolio deliver an annualized alpha of 21.0% and 19.6% respectively. Both portfolios deliver superior excess returns, but conduct being the most significant one. These findings are in line with what Berle et al. (2022) found on the total portfolio, but our alpha estimates being larger in magnitude and notably similar.

In accordance with literature by Chava (2014) and Bolton and Kacperczyk (2021), we could expect that companies excluded due to environmental issues will generate higher returns. This is seemingly correct, as more than half (i.e., 64%) of companies within the conduct-criterion in emerging markets are due to environmental issues. In addition, our finding of significant

alpha of the product portfolio substantiates the early literature on "sin" stocks (Hong & Kacperczyk, 2009).

Neither of the two exclusion portfolios have a significant exposure to any of the risk factors. As for the regressions on the periods in emerging markets, the Fama-French five-factor model also seems to explain a very small part of the variation for product- and conduct-exclusions in emerging markets. Again, as highlighted in the analysis of the sub-periods, it might be other exogenous variables which may explain the observed return but are not captured by the risk factors.

5.2.2 Sectors

5.2.2.1 Portfolios

Table 5.8: Estimates of annualized alpha of the economic sector portfolios

Table 5.8 reports estimates of the Fama-French five-factor model regression, $(r_{p,t} - r_{m,t}) = \alpha_p + \beta(r_{M,t} - r_{f,t}) + b^{SMB}SMB_t + b^{HML}HML_t + b^{RMW}RMW_t + b^{CMA}CMA_t + \varepsilon_t$. The dependent variable, $(r_{p,t} - r_{m,t})$, are the monthly returns of the economic sector exclusion portfolio minus the respective sector index monthly returns. $r_{f,t}$ is the risk-free rate, SMB, HML, RMW, CMA are the Global Ken French factors. The explanatory variable $r_{M,t} - r_{f,t}$ (Rm-Rf) is the FTSE Global All Cap index minus the risk-free rate. All the exclusion portfolios are market value-weighted with monthly data from 2005 to 2022. Observations are the number of included months in each exclusion sub-portfolio. Standard errors in parenthesis are Newey-West adjusted. Annualized alphas are calculated from monthly alphas as $Annual\ \alpha = (1 + \alpha_i)^{12} - 1$. Significance levels are indicated as: $* p < 10\%$, $** p < 5\%$,$*** p < 1\%$.

	Basic Materials	**Consumer Cyclicals**	**Consumer Non-Cyclicals**	**Energy**	**Industrials**	**Utilities**
Alpha	0.011***	0.006**	0.001	0.009**	0.007***	0.004**
	(0.004)	(0.003)	(0.003)	(0.004)	(0.002)	(0.001)
Rm-Rf	-0.011	0.129*	-0.406***	-0.445***	-0.113*	-0.092*
	(0.092)	(0.066)	(0.059)	(0.103)	(0.059)	(0.046)
SMB	0.179	-0.284	-0.440**	-0.707**	-0.292*	0.128
	(0.263)	(0.185)	(0.169)	(0.305)	(0.166)	(0.130)
HML	0.559**	0.233	-0.292*	-0.599**	0.216	0.088
	(0.245)	(0.175)	(0.159)	(0.291)	(0.157)	(0.113)
RMW	-0.148	-0.102	0.806***	0.121	-0.153	0.051
	(0.362)	(0.259)	(0.235)	(0.390)	(0.231)	(0.158)
CMA	-1.051***	0.243	1.672***	0.418	0.224	0.113
	(0.349)	(0.247)	(0.225)	(0.436)	(0.224)	(0.169)
Annualized Alpha	**14.0%**	**8.2%**	**1.2%**	**11.4 %**	**8.2 %**	**4.9 %**
Adj. R^2	0.057	0.066	0.602	0.227	0.101	0.127
Observations	194	199	194	151	203	76

First and foremost, we observe that the alpha estimates of the economic sector portfolios show similarities. Five out of six sector models returned a statistically significant annualized alpha between 4.9% to 14.0%. Evidently, based on these sector models we can in contrast to the early study by Beck and Fidora (2008) conclude that sector-specific screens do deliver superior

returns. For the sixth sector, the Consumer Non-Cyclicals, our results contradict with the pioneering study on "sin" stocks by Hong and Kacperczyk (2009). As of all companies excluded based on tobacco from figure 5.3 are in the Consumer Non-Cyclicals sector, which do not outperform the market. These results might be expected as table 5.3 showed that the Consumer Non-Cyclicals sector seemingly had most periods with underperformance relative to their index of all the sectors.

Secondly, the market risk factor is positive and statistically significant for five out of six models. The results suggest that the Consumer Cyclicals sector consist of high-beta stocks, while the other sectors consist of low-beta stocks. A possible explanation for the difference in the beta could be that companies excluded in the Consumer Cyclicals sector are stocks in industries more affected by macroeconomic changes.

Thirdly, the size factor is negative and statistically significant across three out of six models. "Sin" stocks are likely to belong to monopolistic industries (Fabozzi et al. 2008), and it might be that these industries are dominated by companies with large market caps. It seems like companies excluded within the Consumer Non-Cyclicals, Industrials, and Energy sector are larger than companies in the overall market. Typical companies excluded in these three sectors are within industries such as tobacco, nuclear weapons, coal, and E&P within oil and gas, which may be viewed as industries consisting of large monopolistic companies.

Further, the value factor is positive and statistically significant for the Basic Materials sector, indicating that the exclusion portfolio consists of more value stocks compared to the market. The value factor is negative and statistically significant for the Consumer Non-Cyclicals and Energy sector, which indicate that these sector portfolios consist of more growth stocks.

It is only the Consumer Non-Cyclicals sector which has a significant exposure to the profitability factor. The exclusions within the Consumer Non-Cyclicals sector are mainly tobacco companies. Tobacco companies are typically categorized as "sin" stocks, and these stocks are often within industries which have existed for decades. Thus, it can be reasonable to assume that these companies are at a mature stage of their life cycle and therefore have more robust profitability than the rest of their sector (Kenton, 2019). The highly significant and positive investment factor can be seen in connection with "sinful" companies often reducing their investments after being negatively screened as highlighted earlier in sub-section 5.2.1.

On the other hand, the portfolio consisting of stocks in the Basic Material sector has an exposure towards companies with an aggressive investment style compared to the market.

Lastly, the five-factor model seems to explain parts of the variation in the data set for the different sectors. The explanatory power varies between 5.7% to 60.2%, depending on the sector. This is probably expected as some of the sectors are often typically overrepresented by one specific reason of exclusion, while others have several reasons of exclusion in their sector, as pointed out in section 5.1. For example, the explanatory power is highest for the regression model of the Consumer Non-Cyclicals sector, which mostly consist of tobacco-companies excluded based on the product-criterion.

5.2.2.2 Exclusion criteria

Table 5.9: Estimates of annualized alpha of exclusion criteria in sector portfolios

Table 5.9 reports estimates of the Fama-French five-factor model regression, $(r_{p,t} - r_{m,t}) = \alpha_p + \beta(r_{M,t} - r_{f,t}) + b^{SMB}SMB_t + b^{HML}HML_t + b^{RMW}RMW_t + b^{CMA}CMA_t + \varepsilon_t$. The dependent variable, $(r_{p,t} - r_{m,t})$, are the monthly returns of the exclusion criteria within each economic sector exclusion portfolio minus the monthly returns of the respective sector index. $r_{f,t}$ is the risk-free rate, SMB, HML, RMW, CMA are the Global Ken French factors. The explanatory variable $r_{M,t} - r_{f,t}$ (Rm-Rf) is the FTSE Global All Cap index minus the risk-free rate. All the exclusion portfolios are market value-weighted with monthly data from 2005 to 2022. Observations are the number of included months in each exclusion sub-portfolio. The Consumer Non-Cyclicals sector is not included, as all companies excluded in this sector are based on the product-criterion. Standard errors in parenthesis are Newey-West adjusted. Annualized alphas are calculated from monthly alphas as $Annual\ \alpha = (1 + \alpha_i)^{12} - 1$. Significance levels are indicated as: $* p < 10\%$, $** p < 5\%$,$*** p < 1\%$.

	Basic Materials		**Consumer Cyclicals**		**Energy**		**Industrials**		**Utilities**	
	Product	**Conduct**	**Product**	**Conduct**	**Product**	**Conduct**	**Product**	**Conduct**	**Product**	**Conduct**
Alpha	0.017*	0.008	0.005**	-0.004	0.016*	0.004	0.006***	0.009	0.004**	-0.003
	(0.007)	(0.004)	(0.003)	(0.006)	(0.009)	(0.005)	(0.002)	(0.007)	(0.002)	(0.005)
Rm-Rf	-0.248	0.029	0.129*	0.407**	-0.796***	-0.353***	-0.125**	0.039	-0.087	-0.090
	(0.155)	(0.101)	(0.066)	(0.157)	(0.098)	(0.124)	(0.060)	(0.160)	(0.052)	(0.082)
SMB	-0.299	0.496*	-0.330*	1.166**	0.588	-1.033***	-0.303*	0.352	0.111	-0.011
	(0.447)	(0.289)	(0.187)	(0.482)	(0.548)	(0.371)	(0.166)	(0.452)	(0.148)	(0.243)
HML	0.747*	0.411	0.212	0.290	-0.321	-0.728**	0.260	-0.319	0.100	0.033
	(0.423)	(0.270)	(0.176)	(0.464)	(0.485)	(0.355)	(0.158)	(0.429)	(0.128)	(0.216)
RMW	-1.374**	-0.006	-0.158	0.8290	0.576	0.019	-0.138	-0.768	0.023	0.186
	(0.622)	(0.399)	(0.262)	(0.591)	(0.685)	(0.480)	(0.233)	(0.636)	(0.179)	(0.307)
CMA	-1.052*	-0.786**	0.234	1.065	-0.184	0.688	0.196	0.265	0.069	0.329
	(0.596)	(0.380)	(0.250)	(0.668)	(0.730)	(0.533)	(0.223)	(0.609)	(0.192)	(0.325)
Annualized Alpha	**21.8%**	**10.0%**	**6.2%**	**-0.9%**	**20.3%**	**4.9%**	**7.4%**	**11.4%**	**4.9%**	**-3.5%**
Adj. R^2	0.047	0.042	0.065	0.114	0.213	0.162	0.110	0.015	0.072	0.024
Observations	184	194	199	144	77	151	203	199	76	76

As it will be the product-criterion that captures any industry-specific effects from their sector index, it is interesting to further look at the two exclusion criteria separately. The first noticeable finding is that all alpha estimates of the product portfolios are significant, while none of the alpha estimates are significant of the conduct portfolios. Our regression results for the product portfolios shows significant annualized alphas between 4.9% to 21.8%, but with

different significance levels. Our regression results indicate that exclusionary screening based on products outperforms the GPFG's equity benchmark.

The market factor is only significant for the Energy and Industrials sector, which consist of mostly low-beta stocks. The Consumer Cyclicals sector and the Industrials sector portfolios consist of larger companies compared to the market. As expected, the model shows that the Industrials sector has a significant tilt towards larger companies, as all the excluded companies producing nuclear weapons belong to this sector.

It is only the product portfolio within the Basic Materials sector which has a significant exposure to the other risk factors. This portfolio consists of value stocks, companies with weak profitability, and an aggressive investment strategy. Particularly the significant exposure towards companies with weak profitability and an aggressive investment style indicate other features of this exclusion portfolio than typically monopolistic characteristics expected of "sin" stocks (Fabozzi et al., 2008).

Finding almost similar alpha estimates of the sectors and relatively low explanatory power for most of the models, supports the suspicion that there may be other unobserved factors influencing the excess returns. This is substantiated by the fact that the portfolios show different exposure to the risk factors, with relatively few factors being significant. Consequently, we are careful with fully trusting the interpretations of the coefficients of the regressions, especially those with lower explanatory power as this may indicate that the model works poorly in these regressions.

6. Discussion

This thesis aims to answer whether excluded companies from the GPFG's investment universe deliver superior excess returns and how these returns may differ between i) markets, ii) sub-periods, iii) economic sectors, and iv) exclusion criteria. This chapter presents a further discussion of our findings presented in the previous chapter. As we discuss these findings, it should be kept in mind that an alpha different from zero might represent a pricing error and suggest that an inadequate asset pricing model has been applied[28]. Nevertheless, this discussion is based on the interpretation that our estimated alphas represent superior excess returns.

6.1 Markets

Table 6.1: Summary of the estimated annualized alphas of the markets

The annualized alpha estimates in percentages are from the regression results in Table 5.3 to 5.6 from sub-section 5.2.1. Significance levels are indicated as: $* p < 10\%$, $** p < 5\%$, $*** p < 1\%$.

Annualized Alpha				
Markets		**Total**	**Product**	**Conduct**
Developed markets	*2005 - 2022*	6.5%***	6.0%***	5.4%
Developed markets	*2005 - 2016*	8.2%***		
Developed markets	*2017 - 2022*	6.0%**		
Emerging markets	*2007 - 2022*	25.3%**	21.0%**	19.6%***
Emerging markets	*2007 - 2016*	39.3%**		
Emerging markets	*2017 - 2022*	12.7%***		

Firstly, we find that the exclusion portfolio of both markets outperforms for all periods with the first sub-period having the highest alpha estimate when controlling for the Fama-French risk factors. These alpha estimates indicate that investors, such as the GPFG, abstaining from these excluded companies in both markets, pay a significant financial cost by doing so (e.g., Pástor et al., 2021).

[28] As pointed out in Model Weaknesses in section 4.3

The finding of superior excess returns for excluded stocks of the GPFG supports the findings of Berle, He, and Ødegaard (2022). As these researchers analyzed the total portfolio, exclusion criteria, and the U.S. market, our study contributes by confirming similar results for developed and emerging markets. Our results for emerging markets are, however, of greater magnitude to the alphas found by Berle et al. (2022).

There are several possible explanations for the findings of significant alphas in both markets but of different magnitude. One explanation can be viewed in relation to Fabozzi et al. 's (2008) argument that investors willing to take on the risk related to investing in unethical companies will be compensated for it. It might be that investing in typical "sinful" companies faces a bigger headline risk in emerging markets than developed markets.

Another important reason for the observed returns is that there exists a flora of systems for ESG-rating (Johnsen, 2020). When various rating agencies give inconsistent assessments on their ratings of companies, this can create uncertainty around ESG itself, as pointed out by Avramov et al. (2021). Junttila et al. (2022) also emphasized that inconsistency in the firm-level information reflected in ESG metrics from different data sources may give different outcomes when considered in investment decisions. Therefore, the exclusionary screening made of the GPFG works rather as a clearer indication that these companies are worst offenders. Thus, it is rather this "framing effect" that makes investors retain from these excluded companies, than the announcement itself, which was also pointed out by both Berle et al. (2022) and Atta-Darkua (2020). Additionally, this effect may differ more in magnitude in emerging markets than developed markets, as there might be even more inconsistency in firm-level information in emerging markets (Odell and Ali, 2016; Garcia et al., 2017). The difference in magnitude could also be that the effect of herding behavior is greater in emerging markets. Emerging markets, as a collective, may therefore be more vulnerable to the "consensus" among institutional investors following the GPFG's decisions to exclude companies (Harto et al. 2021).

While previous research of the GPFG found superior performance (alpha) of both the conduct- and product-criterion, but conduct being the most significant and double the size (Berle et al., 2022), our results demonstrate conflicting findings. For emerging markets, companies excluded of the GPFG based on both product and conduct deliver superior excess returns. However, the alpha estimates are quite similar and conduct the most significant one. For developed markets, our alpha estimates show that only companies excluded of the GPFG

based the product-criterion deliver superior excess returns. Nonetheless, as for emerging markets, both criteria deliver quite identical alpha estimates.

Junttila et al. (2022) highlighted both the potential and ambiguity of using ESG information in emerging markets. A possible explanation for the results is that it can be challenging to identify which companies are behaving unethically in emerging markets, because of reasons pointed out by Garcia et al. (2017). Such as the risk profile of companies, limited disclosure, and undeveloped capital markets. All of which may influence the visibility of breaches of norms and unethical business practices to greater extent compared to developed markets (Kappel et al., 2009; Flammer, 2013; Hirch and Cha, 2015). Thus, the announcement made by the GPFG on exclusions might have a higher framing effect on companies excluded based on conduct compared to products, and therefore investors require higher returns for holding these stocks (Derwall et al., 2011; Hoepner & Schopohl, 2018). Additionally, it seems like companies screened for conduct in emerging markets may have more similar characteristics particularly regarding geography, time of exclusion, industry, and reason of exclusion compared to those in developed markets. All of which are not captured by the risk factors used in our regression models. Therefore, we cannot conclude that the observed alphas in emerging markets are not due to other characteristics.

If viewing countries in developed markets as countries with more restrictive social norms, our findings are in line with literature showing that these countries show a stronger ‘‘sin” effect (e.g., Salaber, 2013; Adamsson & Hoepner, 2015). Another plausible reason for the observed alpha is that the ascending focus on ESG and sustainable investments may disturb the traditional primary focus of a company, which is to generate returns (Boffo & Patalano, 2020). Particularly in developed markets, with their strong awareness and focus on ESG-investments over decades. Thus, these companies excluded for their products typically belonging to “sinful” industries might outperform the market because these companies have found a winning strategy that they stick to. This is substantiated by the product-based exclusion portfolio in developed markets having a significant exposure to larger companies and companies with robust profitability, which might be viewed as typical monopolistic features (Fabozzi et al., 2008). Thus, these companies are presumably larger companies within industries known to generate stable cash flows, probably because of consistent consumer demand. Therefore, based on our findings, we cannot rule out the possibility of superior excess returns being explained by other common characteristics than market affiliation and the use of ESG information.

6.2 Sectors

Table 6.2: Summary of the estimated annualized alphas of the sector portfolios

The annualized alpha estimates in percentages are from the regression results in Table 5.7 and 5.7 from sub-section 5.2.2. Significance levels are indicated as: $* p < 10\%$, $** p < 5\%$, $*** p < 1\%$.

Annualized Alpha			
Economic Sector	**Total**	**Product**	**Conduct**
Basic Materials	14.0%***	21.0%*	10.0%
Consumer Cyclicals	8.2%**	6.2%**	-0.9%
Consumer Non-Cyclical	1.2%	1.2%	
Energy	11.4%**	21.0%*	4.9%
Industrials	8.2%***	7.4%***	11.4%
Utilities	4.9%**	4.9%**	-3.5%

In our sector analysis we used sector indices capturing sector-specific developments to calculate excess returns. Thus, if the significant alphas from our market regressions, discussed in 6.1, were only sector-premiums, our regressions would not give significant alphas. However, as our results show, all but one of the economic sector portfolios outperform the GPFG's equity benchmark. When investigating exclusion criteria within each sector, we find that it is exclusively companies excluded based on products that deliver superior excess returns. Evidently, our findings are in opposition to the early study by Beck and Fidora (2008) concluding no significant returns when controlling for sector-specific effects, but in line with earlier studies investigating the early definitions of typical "sin" stocks (e.g., Fabozzi et al., 2008; Hong & Kacperczyk, 2009).

An important explanation for our results is that it is presumably easier for investors to identify what operations companies run, i.e., which products they produce, as to assess the way their business is operated, i.e., the business' conduct. Consequently, this makes market segmentation based on industries (products) more feasible than how the company practices their business (conduct). On the other hand, given the argument that the exclusionary screening from the GPFG's investment universe frames the behavior of companies which otherwise would be difficult for investors to be aware of (Kappel et al. 2009; Flammer 2013; Hirch and Cha, 2015), one would expect to see significant returns for conduct-based exclusion. For most conduct-based exclusions, however, it is natural to assume there exists at least one comparable

substitute from the same industry. On the opposite side, an adequate substitution is often not possible when an entire economic sector or industry is excluded. Additionally, while sector affiliation is a more permanent feature of a company, the way the company manages its business, either in a responsible or irresponsible manner, can be altered more easily. Viewing this in line with the literature, the risk from market segmentation and limited risk sharing is thus more likely to be materialized for the product-based exclusions of the GPFG (Derwall et al., 2011; Hoepner & Schopohl, 2018). While the risk for conduct-based exclusion is probably more easily diversifiable for investors and thus less likely to be compensated.

Based on this reasoning and the literature on "sin" premiums, we would expect particularly the portfolios containing companies within industries viewed as "sinful" to generate superior returns, i.e., weapons, tobacco, and coal. Our results support this theory to some extent, considering the only exclusion portfolio not having a significant alpha is the Consumer Non-Cyclicals sector, which consist of mostly tobacco companies. This finding is not consistent with the study on "sin" premiums by Hong and Kacperczyk (2009) or Capelle-Blancard and Monjon (2014). However, the former study did only investigate U.S. companies, and the latter investigated the implications for the funds itself and not the stocks in question.

By taking a closer look at the economic sectors that do deliver significant alphas, we can see that these sectors mostly consist of companies excluded for either nuclear weapon- or coal-production. Consequently, a possible explanation to why the individual product portfolios outperformed but not the Consumer Non-Cyclicals sector, is that there are common factors affecting returns of all these superior stocks. These factors could be overall market or investment trends, or specific company characteristics. The argument of typical "sin" companies sticking to their "winning strategy" might also be relevant. In other words, excluded companies within coal and weapons know they are selling products which are unethical in some way. Nevertheless, they continue to provide these products instead of changing their business strategies to fit newer investment trends as having profit maximization as their primary objective. For example, within the Industrials sector most companies are excluded based on production of nuclear weapons, which is known to be a monopolistic industry due to companies' reputation and quality through years and generating high and stable returns. This is also largely confirmed by our performance analysis which shows that the exclusion portfolio of the Industrials sector has had a significant exposure towards larger companies compared to the GPFG's market index. This enables portfolios of such stocks to outperform compared to

the overall market and is in line with Fabozzi et al.'s (2008) argument that non-compliant companies are expected to show higher future profits and cash flows.

The implication of our analysis is that exclusionary screening based on products delivers superior excess returns. Thus, investors are expected to be compensated by investing in these product-excluded stocks. However, as our analysis of excess returns in monetary value suggests, the total loss for the Fund has been USD 8.24 billion since the interception of ethical guidelines. This corresponds to approximately 1% of the Fund's equity value, which for a large institutional investor such the GPFG, accounts for a very small fraction. The preponderance of these excess returns cannot be explained by sector effects when using sector indices, the GPFG's own equity benchmark, and controlling for the Fama-French factors. Our results imply there are other common characteristics explaining the superior excess returns of the companies excluded for their products of the GPFG. In the same way as others before us, we cannot conclude that superior excess returns are explicitly connected to the exclusionary screening of the GPFG and not due to firm- or industry-specific characteristics of these companies.

7. Conclusion

Previous research suggests that exclusionary screening harms financial performance, and thus being a responsible investor means sacrificing financial returns (e.g., Pástor et al., 2021). We address these findings in our thesis, by analyzing whether excluded companies of the GPFG's investment universe deliver superior excess returns and where these returns are created. There is limited literature available on the performance of GPFG's excluded companies' sub-portfolios and previous research have come to contradicting conclusions (e.g., Berle et al., 2022; Atta-Darkua, 2020; Eriksen et al., 2020; Beck & Fidora, 2008). Therefore, we wanted to contribute to the literature by examining the excluded stocks and criteria for exclusion in a new time span, geographical areas, and within economic sector affiliation.

We have contributed to the existing literature on the relationship between exclusionary screening and financial performance in developed and emerging markets. By applying performance tests, we establish that these market portfolios have superior excess returns (alpha) in all the investigated periods relative to the predictions of the Fama-French five-factor model. These sub-portfolios have statistically significant excess returns as high as 39.3% in annual terms. When looking at the two markets regarding reason of exclusion, we get ambiguous results on which exclusion criterion that explains returns. We find that companies excluded for both their conduct and product have outperformed in emerging markets, while only companies excluded for their product have outperformed in developed markets. The observed magnitude of the superior excess returns is, however, greater in emerging markets for all periods, which supports the literature of Harto et al. (2021), Garcia et al. (2017), and Junttila et al. (2022).

More importantly, we have shed light on the relationship between the observed superior excess returns and sector effects. Our performance results suggest that the observed alpha of the market regressions cannot be explained by sector effects, as we find superior excess returns of five out of six sector portfolios when using GPFG's own equity benchmark. These findings are in opposition to what Beck and Fidora (2009) found. As only companies being excluded for their products outperforms, which typically belong to industries categorized as "sinful", our results support the findings of a "sin" premium by Hong and Kacperczyk (2009), Fabozzi, Ma and Oliphant (2008), Capelle-Blancard and Monjon (2014), Chava (2014), and Bolton and Kacperczyk (2021), but not to what Blitz and Fabozzi (2017) found. Consequently, our analysis indicates reason to believe that there are common characteristics of these "sinful"

companies explaining the superior excess returns and not explicitly the announcement made of the Fund on exclusion, also highlighted by Berle et al. (2022) and Atta-Darkua (2021).

Our findings are, however, subject to several limitations. It seems as the performance implications are dependent on the Fund's particular screening approach as well as the ethical norms the exclusion represents. Additionally, we have only evaluated the financial implications in relation to the companies' return. Our findings pose additional questions that represent interesting opportunities for future research. Further studies should look closer at country/region-specific effects, as it seems that the GPFG often excludes companies belonging to the same country. Additionally, as our methodological choices were constrained by time, further research should particularly do a comparable analysis of the excluded stocks to investigate if the returns in fact are driven by industry- or firm specific effects.

Altogether, our analysis indicates that the excluded companies from the GPFG's investment universe deliver superior excess returns and thus the Fund is hurt financially. Our analysis suggests that the monetary loss for the Fund has been USD 8.24 billion over the total period of exclusionary screening, corresponding to about 1% of the market value of the Fund's equity portfolio. From the GPFG's and the Norwegian public's perspective, this is presumably seen as a "small" cost to pay to safeguard both the present and future perception of ethical standards about what could deliver sustainable economic growth. We cannot, however, conclude with certainty that the returns of these companies are explicitly explained by the exclusionary screenings of the GPFG. Regardless, irresponsible investors are expected to be compensated for investing in the product-excluded stocks categorized as "sinful", and thus, doing well while doing bad.

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Appendix

A1 Model testing

A1.1 Breusch-Pagan Test for Homoscedasticity

Table A.1 shows the results of the Breusch-Pagan test applied to test for homoscedasticity. We test for homoscedasticity in all our exclusion portfolios. The null hypothesis is that the error variances are all equal, i.e., homoscedasticity. The significance level is set at 5%. The high P-values in the table indicate that we cannot reject the null hypothesis of homoscedasticity. Hence, the conclusion is that we do not have the presence of heteroscedasticity in our data. In other words, there is no clear necessity to adjust the standard errors for heteroskedasticity when conducting hypothesis testing based on our portfolios (Wooldridge, 2012).

Table A.1: Breusch-Pagan test for Homoscedasticity

TEST OF HETEROSKEDASTICITY											
	Sector Portfolio									Market Portfolio	
	Basic Materials FF5F	Consumer Cyclicals	Consumer Non-Cyclicals FF5F	Energy FF5F	Energy FF3F	Industrials FF5F	Industrials FF3F	Utilities FF5F	Utilities FF3F	Emerging	Developed
P-value	0.7120	0.6368	0.051	0.294	0.359	0.06	0.6698	0.5308	0.9849	0.5425	0.9740

A1.2 Breusch-Godfrey Test for Autocorrelation

Table A.2 shows the results of the Breusch-Godfrey test for autocorrelation. The significance level is set at 5%. For the coefficient estimates, autocorrelation is no problem. That is, the coefficient estimates are still consistent (Wooldridge, 2012). However, standard errors and statistical tests need to be adjusted for autocorrelation if it is present. The null hypothesis is no autocorrelation in our portfolios. Hence, a low P-value indicates that we have a problem. From the table we observe high P-values for our portfolios and cannot reject the null hypothesis of no autocorrelation for any of our tests. We therefore conclude that autocorrelation is not a problem in our data set.

Table A.2: Breusch-Godfrey Test for Autocorrelation

TEST OF AUTOCORRELATION											
	Sector Portfolio									Market Portfolio	
	Basic Materials	Consumer Cyclicals	Consumer Non-Cyclicals	Energy FF5F	Energy FF3F	Industrials FF5F	Industrials FF3F	Utilities FF5F	Utilities FF3F	Emerging	Developed
P-value	0.9649	0.9492	0.9453	0.9512	0.9174	0.863	0.886	0.5393	0.5633	0.9192	0.926

A1.3 Augmented Dickey-Fuller Test for Unit Root

Table A.3 shows the results from the augmented Dickey-Fuller test for stationarity. The test is conducted for all dependent and independent variables used in our regressions. The null hypothesis is that the data is non-stationary, i.e., that a unit root is present. The significance level is set at 5%. Hence, high P-values indicate that we have a problem. From the table we observe low P-values for our portfolios and pricing factors, and we can reject the null hypothesis for all our tests at a 5% level. We, therefore, conclude that all our variables are stationary and can be applied to the OLS regressions without any problems.

Table A.3: Augmented Dickey-Fuller Test for Unit Root

TEST OF STATIONARITY								
	Sector Portfolio						Market Portfolio	
	Basic Materials	Consumer Cyclicals	Consumer Non-Cyclicals	Energy	Industrials	Utilities	Emerging	Developed
	P-value	*P-value*	*P-value*	*P-value*	*P-value*	*P-value*	*P-value*	*P-value*
Exclusion Portfolio	0.01	0.01	0.01	0.02	0.01	0.04	0.01	0.01

Pricing factors	P-value
Rm-Rf	0.01
SMB	0.01
HML	0.01
RMW	0.01
CMA	0.01

A2 Total list of excluded companies

Table A.4: Overview of excluded companies and their corresponding information

Table A.5 gives an overview of the full list of excluded companies in the whole period from 2005 until 2022. Column (1) shows the companies: * Removed for its date of exclusion being too recent, ** Re-excluded and therefore listed twice in the overview, *** Other reasons including M&A's, delisting's, etc., **** We have excluded Singapore Technologies which were excluded already in 2002 from our sample. As this observation would i) be the only observation between the years 2002-2005 and would not provide any insight into the return distribution, and ii) the exclusion happened before the CoE was established in 2004. Column (2) shows when the companies were excluded, and the year listed in parentheses is when the exclusion was revoked. Column (3) is the company's' respective market, defined by FTSE Russell's classifications. Column (4) shows which countries each company is registered in (not which stock exchange, as several companies are listed on multiple stock exchanges). Column (5) lists the reason for exclusion, published at NBIMs website. Column (6) is whether the company is excluded based on the product or conduct criteria. Column (7) shows the industry group each company belongs to, which is added to give more depth to our analysis and discussion as Column (8), economic sector, can be too shallow.

Company	Excluded (Revoked)	Market	Country	Reason for exclusion	Product or Cor	Industry Group	Economic Sector
Aboitiz Power Corp.	2016	Emerging	Philippines	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
AECOM	2018 (2020)	Developed	USA	Production of nuclear weapons	Product	Construction & Engineering	Industrials
Aerojet Rocketdyne Hdg.	2008	Developed	USA	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
AES	2016	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Aes Andes	2016	Emerging	Chile	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Africa Israel Investments	2010 (2020)	Developed	Israel	Serious violations of individuals' rights in situations of war or conflict	Conduct	Homebuilding & Construction Supplies	Consumer Cyclicals
AGL Energy Ltd.	2020	Developed	Australia	Production of coal or coal-based energy	Product	Multiline Utilities	Utilities
Airbus	2005	Developed	Netherland	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
Allete Inc	2016	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Alliant Energy (Xsc)	2016	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Altria Group	2010	Developed	USA	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
Ameren Corp	2016	Developed	USA	Production of coal or coal-based energy	Product	Multiline Utilities	Utilities
American Electric Power Co. Inc.	2016	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Anglo American	2020	Developed	United Kingdom	Production of coal or coal-based energy	Product	Metals & Mining	Basic Materials
Ashtrom Group	2021	Developed	Israel	Serious violations of individuals' rights in situations of war or conflict	Conduct	Construction & Engineering	Industrials
Atal SA	2018 (2021)	Emerging	Poland	Violation of human rights	Product	Homebuilding & Construction Supplies	Consumer Cyclicals
Aurora Cannabis *	2022	Developed	Canada	Production of cannabis	Product	Pharmaceuticals	Healthcare
Bae Systems Plc. **	2018	Developed	United Kingdom	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
Bae Systems Plc. **	2006 (2013)	Developed	United Kingdom	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
Barrick Gold Corp.	2009	Developed	Canada	Severe environmental damage	Conduct	Metals & Mining	Basic Materials
Beijing Tong Ren (Szs) Tang Chinese Medicine	2021	Developed	Hong Kong	Severe environmental damage	Conduct	Pharmaceuticals	Healthcare
Bharat Heavy Els.	2017	Emerging	India	Severe environmental damage	Conduct	Machinery, Equipment & Components	Industrials
Boeing Co.	2006	Developed	USA	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
British American Tobacco Plc.	2010	Developed	United Kingdom	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
BWX Technologies Inc.	2013	Developed	USA	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
Canadian Natural Resources Ltd.	2020	Developed	Canada	Unacceptable greenhouse gas emissions	Conduct	Oil & Gas	Energy
Canopy Growth *	2022	Developed	Canada	Production of cannabis	Product	Pharmaceuticals	Healthcare
Capital Power Corp.	2016	Developed	Canada	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Capricorn Energy ***	2016	Developed	United Kingdom	Violation of ethical norms	Product	Oil & Gas	Energy
Cenovus Energy	2020	Developed	Canada	Unacceptable greenhouse gas emissions	Conduct	Oil & Gas	Energy
Centrais Eletricas Brasilieras SA	2020	Emerging	Brazil	Violation of human rights	Conduct	Electrical Utilities & IPPs	Utilities
CESC Ltd.	2016	Emerging	India	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Cez AS	2017	Emerging	Czech Republic	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
China Coal Energy 'A'	2016	Emerging	China	Production of coal or coal-based energy	Product	Coal	Energy
China Resources Power Holdings Co. Ltd.	2016	Developed	Hong Kong	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
China Shenhua En.Co.'H'	2016	Emerging	China	Production of coal or coal-based energy	Product	Coal	Energy
China Traditional Chi Medicine	2021	Developed	Hong Kong	Severe environmental damage	Product	Pharmaceuticals	Healthcare
Chugoku Electric Power Co. Inc.	2016	Developed	Japan	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
CLP Holdings	2016	Developed	Hong Kong	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Coal India Ltd.	2016	Emerging	India	Production of coal or coal-based energy	Product	Coal	Energy
Consol Energy Inc.	2016	Developed	USA	Production of coal or coal-based energy	Product	Coal	Energy
Cronos Group *	2022	Developed	Canada	Production of cannabis	Product	Pharmaceuticals	Healthcare
Danya Cebus	2010	Developed	Israel	Serious violations of individuals' rights in situations of war or conflict	Conduct	Construction & Engineering	Industrials
Datang Int.Power Generation. 'A'	2016	Emerging	China	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
DMCI Holdings Inc.	2016	Emerging	Philippines	Production of coal or coal-based energy	Product	Consumer Goods Conglomerates	Consumer Non-Cyclicals
Dongfeng Motor Gp.'H'	2009 (2014)	Emerging	China	Serious violations of individuals' rights in situations of war or conflict	Product	Automobiles & Auto Parts	Consumer Cyclicals
Drax Group Plc.	2016 (2020)	Developed	United Kingdom	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
DRD Gold Ltd.	2007 (2009)	Emerging	South Africa	Severe environmental damage	Product	Metals & Mining	Basic Materials
DTE Energy Co.	2016	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Duke Energy	2016	Developed	USA	Severe environmental damage	Conduct	Electrical Utilities & IPPs	Utilities
Eastern Tobacco *	2022	Emerging	Egypt	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
El Swedy Electric Co.	2020	Emerging	Egypt	Severe environmental damage	Conduct	Machinery, Equipment & Components	Industrials
Elbit Systems Ltd.	2009	Developed	Israel	Other particulary serious violations of ethical norms	Conduct	Aerospace & Defense	Industrials
Elco Ltd.	2021	Developed	Israel	Serious violations of individuals' rights in situations of war or conflict	Product	Construction & Engineering	Industrials
Electra Ltd.	2021	Developed	Israel	Serious violations of individuals' rights in situations of war or conflict	Conduct	Construction & Engineering	Industrials
Electric Power Development Co. Ltd.	2016	Developed	Japan	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Electricity Generating Plc.	2016	Emerging	Thailand	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Emera Inc.	2016	Developed	Canada	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Eneva SA	2017	Emerging	Brazil	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Engie Energia Chile	2016	Emerging	Chile	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Evergreen Marine Corp. Taiwan Ltd.	2018	Emerging	Taiwan	Severe environmental damage / Violation of human rights	Conduct	Freight & Logistics Services	Industrials
Evergy Inc.	2019	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Exxaro Resources Ltd.	2016	Emerging	South Africa	Production of coal or coal-based energy	Product	Coal	Energy
FirstEnergy Corp.	2016	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Fluor Corp.	2018	Developed	USA	Production of nuclear weapons	Product	Construction & Engineering	Industrials
FMC Corp.	2011 (2013)	Developed	USA	Violation of ethical norms	Product	Chemicals	Basic Materials
Formosa Chemichals & Fibre Corp	2020	Emerging	Taiwan	Violation of human rights	Conduct	Chemicals	Basic Materials
Formosa Taffeta Co. Ltd.	2020	Emerging	Taiwan	Violation of human rights	Conduct	Textiles & Apparel	Consumer Cyclicals
Freeport McMoRan Copper & Gold Inc	2006	Developed	USA	Severe environmental damage	Conduct	Metals & Mining	Basic Materials
G4S Plc.	2019 (2021)	Developed	United Kingdom	Violation of human rights	Product	Professional & Commercial Services	Industrials
General Dynamics Corp.	2005 (2019)	Developed	USA	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
Genting Bhd.	2015	Emerging	Malaysia	Severe environmental damage	Conduct	Hotels & Entertainment Services	Consumer Cyclicals
Glencore Plc.	2020	Developed	Switzerland	Production of coal or coal-based energy	Product	Metals & Mining	Basic Materials
Grand Pharmaceutical Group Ltd.	2021	Developed	Hong Kong	Severe environmental damage	Conduct	Pharmaceuticals	Healthcare
Grupo Carso Series A1	2011 (2019)	Emerging	Mexico	Production of tobacco	Product	Consumer Goods Conglomerates	Consumer Non-Cyclicals
Guangdong Electric Power Development 'A'	2016	Emerging	China	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Gudang Garam Tbk. Pt.	2010	Emerging	Indonesia	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
Gujarat Mineral Development Corporation	2016	Emerging	India	Production of coal or coal-based energy	Product	Coal	Energy

Halcyon Agri	2019	Developed	Singapore	Severe environmental damage	Conduct	Automobiles & Auto Parts	Consumer Cyclicals
Hanwha Corp.	2008 (2021)	Developed	South Korea	Production of nuclear weapons	Product	Insurance	Financials
HK Electric Investments	2017	Developed	Hong Kong	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Hokkaido Electric Power Co. Inc.	2016	Developed	Japan	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Hokuriku Electric Power Co.	2016	Developed	Japan	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Honeys Holdings Co. Ltd	2021	Developed	Japan	Violation of human rights	Conduct	Specialty Retailers	Consumer Cyclicals
Honeywell International Group	2006	Developed	USA	Production of nuclear weapons	Product	Consumer Goods Conglomerates	Consumer Non-Cyclicals
Huabao International Holdings Ltd	2013	Developed	Hong Kong	Production of tobacco	Product	Chemicals	Basic Materials
Huadian Energy 'A'	2017	Emerging	China	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Huadian Power International 'H'	2016	Emerging	China	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Huaneng Power Intl.'A'	2016	Emerging	China	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Huntington Ingalls Industries Inc.	2018	Developed	USA	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
Idacorp Inc.	2016	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
IJM Corporation Bhd	2015 (2022)	Emerging	Malaysia	Severe environmental damage	Product	Construction & Engineering	Industrials
Imperial Brands	2010	Developed	United Kingdom	Production of tobacco	Conduct	Food & Tobacco	Consumer Non-Cyclicals
Imperial Oil	2020	Developed	Canada	Unacceptable greenhouse gas emissions	Product	Oil & Gas	Energy
Inner Mongolia Yitai Coal 'B'	2016	Emerging	China	Production of coal or coal-based energy	Product	Coal	Energy
ITC Ltd.	2010	Emerging	India	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
Jacobs Engingeering Group Inc.	2013	Developed	USA	Production of nuclear weapons	Product	Construction & Engineering	Industrials
Japan Tobacco Inc	2010	Developed	Japan	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
Jastrzebska Spolka Weglowa	2016	Emerging	Poland	Production of coal or coal-based energy	Product	Coal	Energy
JBS SA	2018	Emerging	Brazil	Gross corruption	Product	Food & Tobacco	Consumer Non-Cyclicals
Kerr-McGee Corp	2005 (2006)	Developed	USA	Serious violations of individuals' rights in situations of war or conflict	Product	Oil & Gas	Energy
Korea Electric Power Corp.	2017	Developed	South Korea	Production of coal or coal-based energy	Conduct	Electrical Utilities & IPPs	Utilities
Korea Line	2018	Developed	South Korea	Severe environmental damage / Violation of human rights	Product	Freight & Logistics Services	Industrials
Kosmos Energy Ltd.	2016	Developed	USA	Violation of ethical norms	Product	Oil & Gas	Energy
KT & G Corp	2018	Developed	South Korea	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
L3 Technologies	2005 (2011)	Developed	USA	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
Leonardo Spa	2017	Developed	Italy	Violation of ethical norms	Conduct	Aerospace & Defense	Industrials
Li Ning	2022	Emerging	China	Violation of human rights	Product	Textiles & Apparel	Consumer Cyclicals
Lingui Developments Dead	2011 (2013)	Emerging	Malaysia	Severe environmental damage	Product	Paper & Forest Products	Basic Materials
Lockheed Martin	2005	Developed	USA	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
Lorillard Inc.	2010 (2015)	Developed	USA	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
Lubelski Wegiel Bogdanka SA	2016	Emerging	Poland	Production of coal or coal-based energy	Product	Coal	Energy
LuThai Textile Co. Ltd. 'A'	2018	Emerging	China	Violation of human rights	Conduct	Textiles & Apparel	Consumer Cyclicals
Malakoff Corp Ltd	2017	Emerging	Malaysia	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Mativ Holdings ***	2013	Developed	USA	Production of tobacco	Product	Chemicals	Basic Materials
MGE Energy Inc.	2016	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Mivne Real Estate	2021	Developed	Israel	Serious violations of individuals' rights in situations of war or conflict	Conduct	Real Estate Operations	Real Estate
MMC Norilsk Nickel	2009	Emerging	Russia	Severe environmental damage	Conduct	Metals & Mining	Basic Materials
New Hope Corp.	2016	Developed	Australia	Production of coal or coal-based energy	Product	Coal	Energy
NHPC *	2022	Emerging	India	Severe environmental damage	Conduct	Electrical Utilities & IPPs	Utilities
Northrop Grumman Corp.	2006	Developed	USA	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
NRG Energy Inc.	2016	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
NTPC Ltd.	2016	Emerging	India	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Nutrien Ltd.	2011 (2019)	Developed	Canada	Severe environmental damage	Product	Chemicals	Basic Materials
Oil & Natural Gas Corp Ltd.	2021	Emerging	India	Serious violations of individuals' rights in situations of war or conflict	Conduct	Oil & Gas	Energy
Okinawa Electric Power Co. Inc.	2016	Developed	Japan	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Orbital Atk Inc. (prev. Alliannt Techsystems Inc)	2005 (2018)	Developed	USA	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
Otter Tail Corp.	2017	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Page Industries Ltd.	2020	Emerging	India	Violation of human rights	Conduct	Textiles & Apparel	Consumer Cyclicals
Peabody Energy Corp.	2016	Developed	USA	Production of coal or coal-based energy	Product	Coal	Energy
PGE Polska Grupa Energetyczna SA	2017	Emerging	Poland	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Philip Morris International Inc.	2010	Developed	USA	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
PNM Resources Inc.	2016	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Poongsan Corp	2006	Emerging	South Korea	Production of cluster munitions	Product	Metals & Mining	Basic Materials
POSCO International	2015	Developed	South Korea	Severe environmental damage	Conduct	Diversified Industrial Goods Wholesalers	Industrials
Precious Shipping Plc.	2018 (2021)	Emerging	Thailand	Severe environmental damage / Violation of human rights	Product	Freight & Logistics Services	Industrials
Public Power Corp.	2016	Emerging	Greece	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Pyxus International Dead	2010 (2020)	Developed	USA	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
Raytheon Technologies ***	2005 (2017)	Developed	USA	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
Reliance Infrastructure Ltd.	2016	Emerging	India	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Reliance Power Ltd.	2016	Emerging	India	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Reynolds American Inc.	2010 (2017)	Developed	USA	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
Rio Tinto Plc.	2008 (2019)	Developed	United Kingdom	Severe environmental damage	Product	Metals & Mining	Basic Materials
RWE AG	2020	Developed	Germany	Production of coal or coal-based energy	Product	Multiline Utilities	Utilities
Safran SA	2006	Developed	France	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
Samling Global Ltd.	2010 (2013)	Developed	Hong Kong	Severe environmental damage	Product	Paper & Forest Products	Basic Materials
San Leon Energy Plc	2016 (2022)	Developed	Ireland	Violation of ethical norms	Product	Oil & Gas	Energy
Sasol Ltd	2020	Emerging	South Africa	Production of coal or coal-based energy	Product	Chemicals	Basic Materials
Scandinavian Tobacco *	2022	Developed	Denmark	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
SDIC Power Holdings 'A'	2017	Emerging	China	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Serco Group Plc.	2008	Developed	United Kingdom	Production of nuclear weapons	Product	Professional & Commercial Services	Industrials
Shanghai Industrial Holdings Ltd.	2011	Developed	Hong Kong	Production of tobacco	Product	Real Estate Operations	Real Estate
Shapir Engineering And Industry	2021	Developed	Israel	Serious violations of individuals' rights in situations of war or conflict	Conduct	Construction & Engineering	Industrials
Shikoku Electric Power	2016	Developed	Japan	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Shikun & Binui	2012	Developed	Israel	Serious violations of individuals' rights in situations of war or conflict	Conduct	Construction & Engineering	Industrials
Souza Cruz SA	2010 (2016)	Emerging	Brazil	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
Suncor Energy Inc.	2020	Developed	Canada	Unacceptable greenhouse gas emissions	Conduct	Oil & Gas	Energy
Swedish Match AB	2010	Developed	Sweden	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
Ta Ann Holdings	2013	Emerging	Malaysia	Severe environmental damage	Conduct	Paper & Forest Products	Basic Materials
Tata Power Co. Ltd.	2016	Emerging	India	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Tenaga Nasional Bhd.	2016	Emerging	Malaysia	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Textron Inc.	2009	Developed	USA	Production of cluster munitions	Product	Aerospace & Defense	Industrials
Texwinca Holdings Co.	2019 (2020)	Developed	Hong Kong	Violation of human rights	Product	Textiles & Apparel	Consumer Cyclicals
Thales SA	2005 (2019)	Developed	France	Production of nuclear weapons	Product	Aerospace & Defense	Industrials
Thoresen Thai Agencies Plc	2018	Emerging	Thailand	Severe environmental damage / Violation of human rights	Conduct	Freight & Logistics Services	Industrials
Tilray Brands *	2022	Developed	USA	Production of cannabis	Product	Pharmaceuticals	Healthcare
Tong Ren Tang Techs.'H'	2021	Emerging	China	Severe environmental damage	Conduct	Pharmaceuticals	Healthcare
TransAlta Corp.	2016	Developed	Canada	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Universal Corp. VA	2010	Developed	USA	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
Vale SA	2020	Emerging	Brazil	Severe environmental damage	Conduct	Metals & Mining	Basic Materials
Vector Group Ltd.	2010	Developed	USA	Production of tobacco	Product	Food & Tobacco	Consumer Non-Cyclicals
Vedanta Ltd. ***	2014	Emerging	India	Severe environmental damage	Conduct	Metals & Mining	Basic Materials
Vedanta Resources ***	2014	Developed	United Kingdom	Severe environmental damage	Conduct	Metals & Mining	Basic Materials
Volcan Compania Minera SAA	2013	Emerging	Peru	Severe environmental damage	Conduct	Metals & Mining	Basic Materials
Wal-mart Stores Inc	2006 (2019)	Developed	USA	Violation of human rights	Product	Food & Drug Retailing	Consumer Non-Cyclicals
Washington H. Soul Pattinson & Co. Ltd.	2019	Developed	Australia	Production of coal or coal-based energy	Product	Coal	Energy
WEC Energy Group Inc.	2016	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Whitehaven Coal Ltd.	2016	Developed	Australia	Production of coal or coal-based energy	Product	Coal	Energy
WTK Holdings Bhd.	2013	Emerging	Malaysia	Severe environmental damage	Conduct	Paper & Forest Products	Basic Materials
Xcel Energy Inc	2016	Developed	USA	Production of coal or coal-based energy	Product	Electrical Utilities & IPPs	Utilities
Yankuang Energy Group 'A'	2016	Emerging	China	Production of coal or coal-based energy	Product	Coal	Energy
Young Poong *	2022	Developed	South Korea	Severe environmental damage	Conduct	Semiconductors & Semiconductor Equipment	Technology
Yunnan Baiyao Group 'A'	2021	Emerging	China	Severe environmental damage	Conduct	Pharmaceuticals	Healthcare
Zijin Mining Group Co. Ltd.	2013	Emerging	China	Severe environmental damage	Conduct	Metals & Mining	Basic Materials
ZTE Corp.	2016	Emerging	China	Gross corruption	Conduct	Communications & Networking	Technology
Zuari Agro Chemicals Ltd.	2013	Emerging	India	Violation of human rights	Conduct	Chemicals	Basic Materials