COMPARISON OF ETHICAL AND CONVENTIONAL MUTUAL FUNDS

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ABSTRACT

COMPARISON OF ETHICAL AND CONVENTIONAL MUTUAL FUNDS

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This study examines the differences and similarities between equity investing USA domiciled ethical and conventional mutual funds on different attributes such as performance, ESG score and sin sector allocation of funds. In this particular study, a comprehensive study is completed using general to specific approach. In this study, you could reach to results of descriptive statistics, bivariant correlation analyses, regression studies and supportive heatmap studies. Additionally, in this study, similarity variables of ethical funds with other funds within its fund family is introduced. In line with introduction, the effect of the generated variable on different attributes of the fund is also tested. According to findings, difference line between ethical and conventional funds are become blurry. The expected clear distinction might not be there anymore.

Keywords: Socially responsible investment, ethical fund, performance, ESG, sin sector allocation

ÖZ

ETİK VE GELENEKSEL YATIRIM FONLARININ KARŞILAŞTIRILMASI

Akbaş, Sinan
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Bu araştırma, Amerika Birleşik Devletleri ikametgâhında hisse senedi yatarımı yapan sosyal ve geleneksel yatırım fonların arasında benzerlikleri ve farklılıkları, performans, ESG puanı ve günah sektör seçimleri gibi nitelikler bazında incelemektedir. Bu araştırmada kapsayıcı bir yaklaşım ile genelden özele doğru giden bir çalışma yapılmıştır. Bu araştırmanın sonuç kısmında betimleyici istatistikler, ikili değişken analizleri sonuçları, regresyon analiz sonuçları ve ısıl harita analizleri detaylı bir biçimde paylaşılmıştır. Ek olarak, sosyal fonların bulundukları aile içerisinde diğer geleneksel fonlar ve sosyal fonlar ile olan benzerliğini gösteren skorlar tanımlanmıştır. Bu tanımlama ile birlikte, yaratılmış olan bu skorların fonların birçok farklı niteliği üzerindeki etkileri incelenmiş ve test edilmiştir. Tezin bulgularına göre, sosyal fonlar ile geleneksel fonlar arasında bulunan çizgi artık bulanıklaşmaya başlamıştır. Beklendik keskin çizgi, artık orada olmayabilir.

Anahtar Kelimeler: Sosyal sorumlu yatırım, etik fon, fon getirisi, ESG, günah sektörü

To My Parents

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I'm glad that I decided to earn an MBA degree. Actually, this program has been taught me not to see every decision as black or white. Indeed, there are many different shades of gray which I was not aware of. I believe that, being able to learn even this lesson has changed my attitude in many different occasions.

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LIST OF ABBREVIATIONS

GSIA	Global Sustainable Investment Alliance
ESG	Environmental, Social and Governance
GICS	Global Industry Classification Standard
ISIN	International Securities Identification Number
LRIC	Lipper Reuters Instrument Code
NAICS	North American Industry Classification System
RIC	Reuters Instrument Code
SR	Socially Responsible
SRI	Socially Responsible Investing
TR	Thompson Reuters
TRBC	Thompson Reuters Business Classification
US SIF	The Forum for Sustainable and Responsible Investment

CHAPTER 1

INTRODUCTION

1.1. Introduction in General

An investor is either a person or an institution who has excess resources and is willing to invest these in a financial instrument or a real asset in order to create a positive return for a given period of time. In general, investors are assumed to have the objective of maximizing their financial returns. Recently, it has been argued that some investors might be willing to give up some financial return in order to invest their resources into investments that create social, environmental and ethical impact. These types of investors are said to make "socially responsible investments (SRI)".

One of the first examples of socially responsible investing was the prohibition of engagement in slave trading for Quakers members during the 1700s in Canada (Tekula and Andersen, 2019). From that day forward, the market for socially responsible investments grew larger albeit in small increments. By the late 1900s, SIRs had taken the form of screening out investments in certain industries such as tobacco, firearms, and alcohol (Tekula and Andersen, 2019). Finally, the strong demand for such investments pushed the creation of the first socially responsible mutual fund, the Pax World Fund, in August 1971 (Radu and Funaru, 2011).

This thesis focuses on the socially responsible mutual funds industry and attempts to answer the question of whether the SRI funds do indeed offer a different investment alternative when compared to conventional funds.

1.2. Sustainable Market Status

Sustainable investment is a term that refers to both socially responsible and ethical investments. Sustainable investments exhibit an increasing trend in terms of

their global volume. According to the 2018 report by Global Sustainable Investment Review, (GSIA, 2019), sustainable investments in the five major markets were valued at $30.7 trillion at the start of 2018 with a 34% increase over the two preceding years where the proportion of the market directed to these investments was 48% for Europe, 39% for the United States, 7% for Japan, 6% for Canada, and 2% for Australia – New Zealand. In addition, according to the same GSIA report, sustainable investing represents more than 50% of total professionally managed assets in Canada, Australia-New Zealand, almost 50% in Europe, 26% in the United States and 18% in Japan. These numbers suggest that as long as the demand for sustainable investing continues to be strong, the market for these investments will maintain its growth trend over the upcoming years.

Turning our attention to the US market, according to the 2018 Report of The Forum for Sustainable and Responsible Investment (US SIF, 2018), US-domiciled assets increased by 38% from $8.7 trillion at the start of 2016 to $12.0 trillion at the start of 2018, with such a sharp trend continuing since 2012 where total assets were around only $3.8 trillion. Furthermore, according to the same report, 22% of the $12.0 trillion in assets were managed by registered investment companies such as mutual funds and exchange traded funds. These trends simply point to the importance of sustainable investments in financial markets and their potential for future growth.

1.3. Asset Selection Criteria for Investors

Socially responsible mutual funds use either negative or positive screens to form their portfolios. The negative screens call for excluding specific industries / stocks from the portfolio based on a set of social, environmental and ethical criteria. Positive screens call for selecting industries or securities that meet a certain threshold level of social, environmental and ethical performance. Radu and Funaru (2011) present these criteria in the following table:

Table 1
Negative and Positive Criterion for Screening Criteria, (Radu and Funaru, 2011)

This table presents both negative and positive screening criteria used by investors during their asset selection process as presented in Radu and Funaru (2011). Panel A presents negative criteria and Panel B presents positive criteria.

Panel A. Negative Criteria	
Tobacco	Pornography / adult entertainment
Alcohol	Abortion / birth control
Gambling	Animal testing
Military weapon	Pork producers
Nuclear power	Healthcare pharmaceuticals
Irresponsible foreign operations	
Panel B. Positive Criteria	
Human rights	Labor relation and workplace condition
Renewable energy	Pollution control
Biotechnology	Corporate governance
Community involvement	Business practice
Shareholder activism	Employment diversity

Investors use different criteria based on where they invest. According to the GSIA 2019 report, negative/exclusionary screening is dominant in Europe, positive screening based on corporate engagement and shareholder action is dominant in Japan and positive screening based on ESG integration is dominant Canada, Australia, New Zealand and the US. There are also overlaps between the screening strategies. For instance, in the US, $11.6 trillion of the $12.0 trillion assets uses both the ESG criteria and negative screening. The GSIA report lists the screening criteria from the mostly to the least used as follows:

- Negative/Exclusionary Screening
- ESG integration
- Corporate engagement and shareholder action
- Norms based screening
- Positive/best-in-class screening
- Sustainability themed investing
- Impact/community investing

CHAPTER 2

LITERATURE REVIEW

2.1. Introduction

Ethical investors are the type of investor who are not willing to give up their ethics for the sake of profit, (Radu and Funaru, 2011). Therefore, such investors are willing to give up some benefits in order to receive other benefits. The literature on SRI is typically concentrated on the following research questions:

- Does screening result in better performance for SRI investors?
- Do SRI investors give up diversification opportunities?
- Does social investing create additional value for the investors?
- Do SRI investors give up possibly higher returns that could be earned from the assets that they screen out?
- Is ESG integration a valid investment strategy for firms?

2.2. Literature on Screening Activities

Some studies find that that screening decreases financial returns at first but returns increase when screening intensity increases. Capelle-Blancard and Monjon (2014) show that the risk-adjusted performance of French SRIs decreases when the number of screens used is five but increases with the increasing number of screens. Additionally, Barnett and Salomon (2006) provide evidence that in the US market, screening intensity has a negative effect on risk-adjusted performance until it reaches seven screens, after which risk-adjusted performance increases with additional screens used, although the negative effect of screening still persists. Derwall, Guenster, Bauer, and Koedijk (2005) also show that many screens do not necessarily improve portfolio

performance and that the timing of the screens may make a difference since different investment trends may be observed over time. [1]

Guerard (1997) analyzed 1,350 stocks for the unscreened equity universe and 950 stocks for the socially screened universe for the 1987 - 1994 period and found no statistically significant difference between the average returns of those universes. Similarly, Schröder (2007) analyzed 29 SRI indices and found that SRI screens for equities lead to neither a significant outperformance nor an underperformance with comparison to benchmark indices.

These results create a controversy about whether screening creates a better outcome in terms of returns for investors or not. Results presented by (John B. Guerard, 1997) and (Schröder, 2007) indeed imply that there is no significant difference between screened and unscreened universes. This result may also depend on the timing of the screen used. Therefore, one could say that there is no obvious answer for whether screening creates a better outcome for investors or not.

2.3. Literature on Diversification

Radu and Funaru (2011) argue that the diversification potential of investors may be decreased by only focusing on SRI funds. Derwall et al. (2005) support this argument by claiming that the screening process's net effect on diversification is the limiting of alternatives available to the investor. (Hong and Kacperczyk, 2009) Hong and Kacperczyk (2009) provide evidence that there is a cost related to being unable to diversify into publicly traded sin companies which are relatively cheap when benchmarked against comparable stocks. As an opposing view, Riedl and Smeets (2017) argue that investors could use socially responsible funds to diversify the riskiness of their portfolios. They claim that investors invest in sin companies while investing SRI at the same time to further decrease their risk per return.

[1] There are also studies that investigate whether specific screens create better performance. For instance, Edmans (2011) shows that an employee satisfaction screen may lead to a superior investment performance since employee satisfaction is typically an indication of a more efficient firm.

2.4. Literature on Created Value

SRI investors are expected to be sensitive to environmental, social and ethical performance of the firms or funds in which they invest. One question that is asked in the literature is whether such a concern creates additional value for these investors.

Chowdhry, Davies and Waters (2018) state that SRI investors who are motivated to hold socially responsible assets, create value for profit-oriented investors since their investment choices push companies to increase their productivity, decrease their pollution, or improve their corporate governance practices just as profit-oriented investors create value for socially responsible investors in a similar manner. Additionally, Chowdhry et al. argue that, in order to emphasize socially oriented outcomes, SRI investors should hold larger proportions of such investments compared to conventional investors. Guerard (1997) gives some examples that social screens used while making investment decisions could lead to better management, generating better results for both investors and firms while also contributing to advancement of society. Edmans (2011) argues that increasing efficiency in operations decreases pollution. This is a significant outcome for the environment and creates better management practices that lead to a happier workforce which indirectly effects the efficiency of the firm.

Overall, SRI investors indeed create value for themselves by easing their consciousness indirectly as being ethical, socially responsible. Additionally, they create value for firms by imposing standard that increase efficiency, workforce welfare etc.[2].

[2] There is some additional research that specifically investigates the value approach. Addy, Chorengal, Collins and Etzel (2019) calculate the dollar value of the impact investing and Viviania and Maurel (2019) approach the issue from a slightly different perspective. Please refer to these studies for further information on the topic.

2.5. Literature on Financial Performance

Financial performance of the SRI funds is extensively researched in the literature in order to understand whether SRI investors are giving up from their returns or not. Some research states that SRI investments do not differ from conventional investments significantly. Hamilton, Jo and Statman (1993) analyzed 17 SRI funds between 1981 to 1985 and 15 SRI funds between 1986 to 1990 and found that social responsibility factors do not have a statistically significant effect on the expected stock returns of companies. According to Guerard (1997), when 950 socially screened and 1,300 unscreened stocks are analyzed for between 1987 and 1994, it is seen that there is no statistically significant difference between the average returns of the screened and unscreened samples. Moreover, Bauer, Koedijk and Otten (2005) compare the returns of ethical and conventional funds from the US, UK and Germany between 1990 and 2001 and find no statistically significant difference in returns. Furthermore, Schroder (2007) analyzes 29 stock indices to understand whether SRI exhibit different performance compared to conventional benchmark indices and find that there is no statistically significant difference. In other words, investment in SRI equity indices does not impose an additional cost in terms of lower returns to the investor. Lastly, Utz and Wimmer (2014) compare 230 SR mutual funds with 37,398 conventional funds and find no compelling evidence to document out-performance or underperformance for either group.

On the other hand, some research argues that, socially responsible portfolios outperform conventional portfolios. Derwall, Guenster, Bauer and Koedijk (2005) created two equity portfolios with distinctive eco-efficiency scores and evaluated them in terms of performance metrics showed that eco-efficient portfolios outperform less eco-efficient portfolios for the 1995-2005 period. As a supporting argument, Edmans (2011) examined the relationship between employee satisfaction and investment returns and found that employee satisfaction is positively correlated with investment returns in the long-run. Such a finding could be expected since employee satisfaction creates a stronger corporate performance which increases production efficiency and

results in an increase in investor returns. These findings may further lend support to Moskowitz (1972) who argued that more profitable companies can afford to be more responsible

Other research shows that, there is a cost of being socially responsible in investment decisions. Research by Brammer, Brooks and Pavelin (2006) analyzed stocks returns with respect to their corporate social responsibility scores and found that firms with higher social performance scores tend to achieve lower returns, whereas firms with the lowest possible scores outperform the market. Bramer et al. also state that devoted private or institutional shareholders are willing to forgo returns in order to feel morally at ease by holding stocks of socially responsible companies. Renneboog, Horst and Zhang (2008) has completed an extensive research globally and found that SRI funds in the US, the UK, and many continental European and Asia-Pacific countries underperform their domestic benchmarks by -2.2% to -6.5% per year while France, Japan and Sweden's risk-adjusted returns of SRI funds are not statistically different from conventional funds. Such an outcome shows that, indeed, investors may be paying a price for being ethical. In addition, research conducted on sin stocks by Hong and Kacperczyk (2009) argues that sin stocks outperform their comparable stocks significantly for the 1965-2006 period. This finding also supports the claim that SRI investors may be willing to forgo the excess returns that they could create from sin stocks Hong and Kacperczyk also talk about norms in the market, such as how institutional investors are not willing to publish their investment strategies and may not prefer to invest in sin stocks that may affect their public image negatively.

Furthermore, for a general view of the SRI performance literature and screening activities, research by Renneboog, Horst, and Zhang (2008b) could be a good guidance which is also referenced by Radu and Funaru (2011) while creating the screening table that was presented in the Introduction chapter of this thesis. Additionally, Capelle-Blancard and Monjon (2012) have done a comprehensive content analysis on socially responsible investment in newspapers and academic journals and found quite interesting results. For example, the bulk of academic articles

on SRI is focused on financial performance by analyzing the question `Does it pay to be good? ` according to.

2.6. Literature on ESG Strategy

As stated earlier, ESG integration is a dominant strategy for several markets but mostly in the US. Manescu (2011) analyzed ESG factors such as community relations, human rights, public safety etc. and their effects on stock performance and showed that for the period between July 1992 and June 2008, only community relations have a significant and positive effect on stock returns. Indeed, these findings may imply that adopting an ESG-based investment strategy may be beneficial if market trends are well known by investors. Laermann (2016) points out that investors using an ESG-based strategy should make their choices based on scores calculated by 3rd parties since the scores presented in company documents may be open for manipulation and dependent on the honesty of the firm. As a supporting argument, Mooji (2017) draws attention to the fact that Volkswagen was an industry leader in terms of its EGS score right before the emission scandal. Therefore, it might be safe to say that basing investment decisions only on the ESG scores may sometimes be misleading for creating a socially responsible portfolio. Not only the ESG scores themselves but even the naming of the funds may be misleading for the investors. For instance, Ielasi, Rossolini and Limberti (2018) show that there is no statistical difference between sustainable funds and ethical funds in terms of risk adjusted returns even though the naming of these funds imply that they may be different from each other.

2.7. Overview of Literature

Literature on SRI mainly focuses on comparing the performance of ethical, or socially responsible, investments with their conventional counterparts and presents mixed evidence on this issue. The one question that is researched relatively less about SRI funds is whether these funds hold truly different portfolios when compared to

conventional funds. Renneboog, Horst, and Zhang (2008) raise the question of whether SRI funds will gradually converge to conventional funds by holding similar assets. as Alternatively, Utz and Wimmer (2014) ask whether the label `SR mutual fund` guarantees the exclusion of clearly unethical firms In order to answer these questions, this thesis analyzes the holdings of socially responsible mutual funds and compares them with those of conventional mutual funds which do not have any claim to be socially responsible.

CHAPTER 3

DATA AND SAMPLE CONSTURCTION

3.1. Data Collection Procedure

As of 30th of June 2019, there were 598,419 mutual funds that were listed in the Thompson Reuters (TR) database globally. To be practical and to use resources efficiently, this thesis focuses on only the USA domiciled equity investing funds. As of the same date there were a total of 61,207 USA domiciled mutual funds of which 29,270 were equity investing funds.

For the mentioned USA domiciled and equity investing funds, an enormous amount of data is gathered directly from TR's search module. These date items are as follows;

- Lipper RIC – (Unique identification code for TR)
- ISIN Code – (Unique identification code)
- Asset Name
- Asset Status – (Liquidated / Active / Merged)
- Launch Date
- Closed Date – (If liquidated or merged)
- Geographical Focus
- Fund Management Company Name
- Investment Objective
- Ethical Flag – (Ethical / Not Ethical)
- Green Flag – (Green / Not Green)
- 1 Month Performance to Last Day – (in % change)

- Latest Year Minus 1 Performance – (yearly performance which occurs 1 year earlier)
- Relative Performance for 1 Year to Last Month End – (relative to fund's benchmark index)
- Beta for 1 Year to Last Month End

In addition to these data items, a great effort has been put into place to collect the portfolio holding data of all funds by making use of TR's Excel module. This module operates most efficiently when the holding data are downloaded for only a small number of funds. According to experience gained from trials, download functions were most efficiently operating with 50 funds at a time. For this purpose, a special code has been written to cluster 29,270 funds in groups of 50 per each. As a result, with a total of 586 clusters needed to be fed to TR's Excel formulas one by one. The module used provides a fund's holding information as of the last entered date. In other words, if the fund is still active, the holding data are provided for the current date, and if the fund is liquidated or merged, holding data are provided as of the liquidation or merger date.

An additional code was written in order to feed the clusters to TR's Excel functions. By doing so, data collection was automized instead of trying to collect all data manually. This automation procedure is used to feed the system by both ISIN Codes and LRICs. Therefore, it is being used twice for all funds in order to collect as much information as possible. Upon completion of the collection of the holding data, the collected information needed to be merged in an order. For this purpose, another code was written to do this specific job. This code selects a fund's ISIN code and matches holding data if available. If not, it tries to collect the same data based on the fund's LRIC and finally creates an ordered dataset. After those procedures were completed, a dataset with around 4 million lines was generated to be analyzed. For each of the unique assets that were held in the portfolios of the SRI funds, if available, ESG scores were also collected by making use of TR's function for the ESG score in the Excel module.

3.2. Data Elimination and Processing

After collecting all the available holding data, of the total number of funds that had the required holding information was 21,272 (out of 29,270). In other words, TR did not have holding data for a total of 7,898 funds; so these funds were excluded from the sample.

Before starting the analysis of holding data, a quick preliminary investigation was performed. There was quite a few instances where the same asset was included in the dataset with different names. For example, one of the funds holds a company's class-A stock whereas another fund holds the same company's class-B stock which creates difference in names and identification codes of although both stocks belong to the same company. In order to solve this problem, Excel is used to manually find a given company's stocks with different names or LRIC numbers in order to force them to have an identical name with respect to their LRIC numbers.

All holding data with approximately 4 million lines and the list of 21,272 funds were fed to Matlab for another script that creates holding information of each fund making use of structure functions in Matlab. As a matter of fact, this structure function was used in most of the analyses in this thesis.

Similar to companies, mutual funds also have different classes. In order to find the similar funds another script was written. This script compared the holdings of each of the 21,272 funds with the rest of the funds' holdings. By doing so, the same funds that appeared in the database with different identification codes were identified and discarded from the sample (a total of 15,318). As a result, a total of 6,003 unique funds remained in the sample.

Before proceeding with the analyses, another script was written to calculate the weighted average ESG score for each fund by using the formula below. These scores are later used to limit the number of funds to be used in analyses.

$$ESG_{Fund} = \sum_{1}^{n} ESG_{Asset,n} * \omega_n$$

Where;

- n is the total number of assets held by the fund.
- $ESG_{Asset,n}$ is the ESG score of the related asset.
- ω_n is the market-value-based weight of the asset within the fund's portfolio.

Note that these ESG scores of the assets are directly taken from the TR's ASSET4 rating. TR uses a method to calculate ESG score with 178 indicators in scoring with different weights on different subset of indicators (Thomson Reuters, 2018). For more information, please take a look at the referenced TR's article on this topic.

In addition, the total available holdings of the fund are also calculated by using the formula below. This is calculated to see whether the collected holding data adds up to 100% or not due to lack of data within the TR database. Alternatively, funds may short sell some of the stocks and buy other ones which causes the total holdings to exceed 100%.

$$W_{Fund} = \sum_{1}^{n} \omega_n$$

Based on the two calculated measures above, the number of funds to be used in the analyses were decreased further by using the following filters:

- In order to keep the analyzed funds diverse enough, funds which hold fewer than 11 assets in their portfolio are discarded. With this criterion, a total of 453 funds were discarded and 5,550 funds remained.
- To keep the sample as large as possible, W_{Fund} value is kept between 70% and 105%. To keep above 70%, 43 funds were discarded. Similarly, to keep below 105%, 98 funds discarded. As result, total of 5,409 funds remained.
- Lastly, there was a single fund which had a negative ESG value, possibly as a result of extensive short selling. This fund is also eliminated from the data set, which resulted in a sample of 5,408 funds to be analyzed further.

3.3. Sin Sector Allocation Calculations

Industry information for each of the assets (stocks) that are held by the 5,408 sample funds is collected via TR's Excel module. In order to make this process easier, a code is written which is very similar with the one used in the collection of holdings. With the procedure, industry information is collected for 22,071 stock by using the following three industry classification schemes:

- TRBC Industry Classes – (total of 133 unique class)
- GICS Sub-Industry Classes – (total of 158 unique class)
- NAICS Industry Group Classes – (total of 290 unique class)

Please note that, all available classifications and their sub-categories were collected for each asset. For example, in TRBC, there are 5 different classification levels: Economic Sector, Business Sector, Industry Group, Industry and Activity level. In order to be efficient, stocks were classified into "sin" industries based on the Industry-Level classification, but further analysis was performed by making a keyword search within each stock's stated activity level classification. A similar method is also used for other classification levels as well.

The keyword-controlled sublevels are;

- TRBC Activity Classes – (total of 713 unique class)
- NAICS International Industry Classes – (total of 603 unique class)
- NAICS National Industry Classes – (total of 964 unique class)

For the three main classes (total of 581), each and every sector was considered whether it includes sin characteristics or not. Some sin industries are casinos and gaming, aerospace and defense, brewers etc. In addition to those, keyword-controlled sublevels were also considered by searching keywords such as alcohol, tobacco, gambling etc.

Upon completion of evaluations, for each asset a single characteristic has been assigned as being a sin asset or not.

Next, the following measures are calculated:

- Sector Availability of Fund's Assets is a measure of the percentage of fund's holdings for which sector information is available.

$$W_{Sector} = \sum_{1}^{n} \omega_n * \varepsilon$$

Where ε is a binary variable i.e. if asset's sector is available $\varepsilon = 1$ else $\varepsilon = 0$.

- Sin Sector within Fund's Assets is a measure of the percentage of fund's holdings that are identified to be in a sin sector.

$$W_{Sin} = \sum_{1}^{n} \omega_n * \varepsilon * \rho$$

Where ρ is a binary variable, if asset's sector is defined as sin $\rho = 1$ else $\rho = 0$.

- Percentage of Availability is a measure of the percentage of the collected holding data for which there is also a sector information.

$$\eta_{Sector} = \frac{W_{Sector}}{W_{Fund}}$$

- Percentage of Sin is a measure of the percentage of sin sectors that are selected within a sector's known asset groups .

$$\eta_{sin} = \frac{W_{Sin}}{W_{Sector}}$$

Note that, in order to calculate W_{Sector} and W_{Sin} another script was written in Matlab which was similar to the one used in the calculation of W_{Fund}. Furthermore, η_{sector} and η_{sin} were calculated in Excel for all 5,408 funds.

3.4. Definition of Data Levels and Supporting Calculations

From this point forward, the previously mentioned 5,408 funds will be referred to as the Sample Universe. Please note that, in this thesis, different sample clusters are considered in order to understand different variables' effect on ethical mutual fund's characteristics.

For all mentioned funds, age of the fund is defined in years. For those funds that merged or were liquidated, age is calculated based on the fund's launch date and closing date. For the funds that are active, age is calculated based on the fund's launch date and 30.06.2019.

In addition, a new flag was created to combine TR's Ethical and Green Flags The combination of these funds under a single flag created the "ethical funds" sample. The rest of the funds that did not have an ethical or green flag given by TR were included in the conventional funds sample. As a result, there are 220 ethical funds within the Sample Universe.

These ethical funds were held by 88 different fund families. These fund families are further classified as follows;

- Families that hold only ethical funds – (total of 31 families)
- Families that hold a single ethical fund and several conventional fund(s) – (total of 32 families)
- Families that hold several ethical funds and several conventional fund(s) – (total of 25 families)

Fund families that held only conventional funds were excluded from the analyses. The 88 fund families mentioned above held 1,351 conventional funds and 220 ethical funds. From now on, this sample of 1,571 funds is defined as Sample Master.

Sample Universe and Sample Master are defined in order to understand fund attributes and characteristics in a general manner. The most important contribution of this thesis to literature is the calculation of the similarity measures that are described below.

Please note that, similarity measures are inspired by the representations of the portfolio overlap values generated by 'the fundoo' internet website. (the fundoo, n.d.) website's tool was able to give information and create representations about different attributes of the funds such as number of common stocks, number of uncommon stocks, percentage of portfolio overlap etc. The main motivation while generating such similarity scores was to be able to create a variable that includes the portfolio overlap

of the funds with their family peers. It is believed that, inclusion of the similarities between funds in the study, would give us a chance to understand how families of funds starts to use different but similar investment strategies.

For the 220 ethical funds, 4 types of similarity measures were calculated within each fund's own family;

- Portfolio overlap similarity in terms of a fund's percentage holding of an asset versus the percentage holding of the same asset by other ethical funds in the same fund family
- Portfolio overlap similarity in terms of a fund's percentage holding of an asset versus the percentage holding of the same asset by conventional funds in the same fund family
- Common assets similarity in terms of the number of common assets between a fund versus the other ethical funds in the same fund family
- Common assets similarity in terms of the number of common assets between a fund versus the conventional funds in the same fund family

In the analysis section, only overlap similarity measures are used since common asset similarities are highly correlated with the overlap similarity values. Therefore, they are only presented in descriptive statistics.

The algorithm for calculating the similarity measures can be presented as follows:

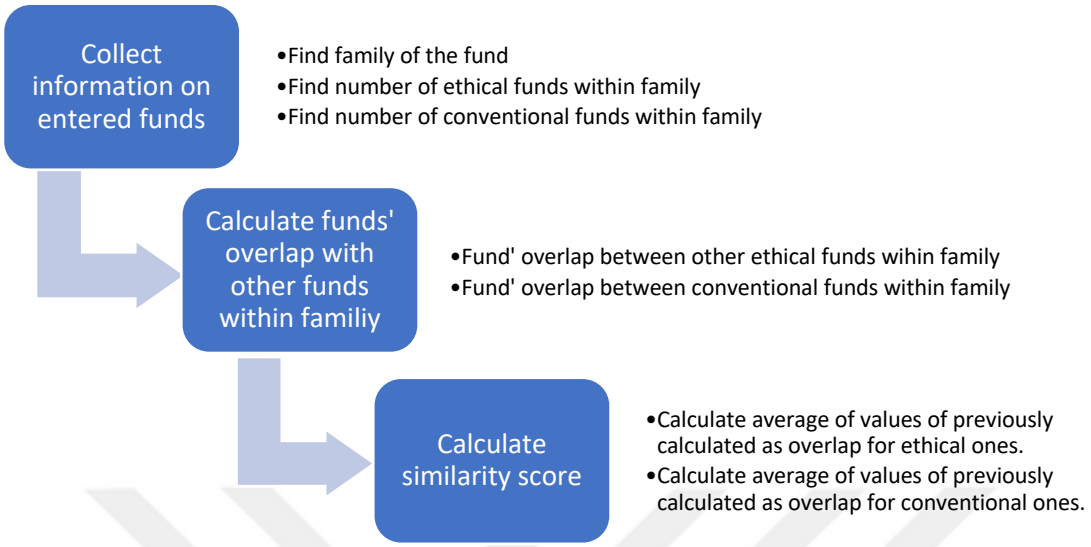


Figure 1: Overlap Similarity Calculation Methodology. This figure illustrates the procedure for the generation of similarity scores in three steps. For the collect information on funds step the TR database is used with the help of some macros. For the calculation of fund's overlap values, a special Matlab code is written and used. For the calculation of similarity scores, additional scrip is written in Matlab.

As explained in Figure 1, overlap similarity measures are calculated for each ethical fund. In order to do this specific calculation, a Matlab script was written. Since each and every asset is cross checked with other funds within the family, it required quite a lot of computation work.

In addition to the similarity measures, the geographical focus of the fund was also taken into consideration for further analysis. In this perspective, in order to calculate the overlap between funds, the algorithm checks whether the fund has the same geographical focus with the fund against which a similarity score is being calculated. This script is illustrated in Figure 2.

Finally, two types of similarity score were calculated. According to presented calculation methods, two sample clusters are generated. First one is named as Sample ExFocus which uses the similarity scores of funds with the first method mentioned in Figure 1. ExFocus means that excluding the geographical focus attributes of the funds.

Furthermore, other sample is defined as Sample InFocus as meaning that includes the geographical focus attribute in similarity scores as mentioned in Figure 2.

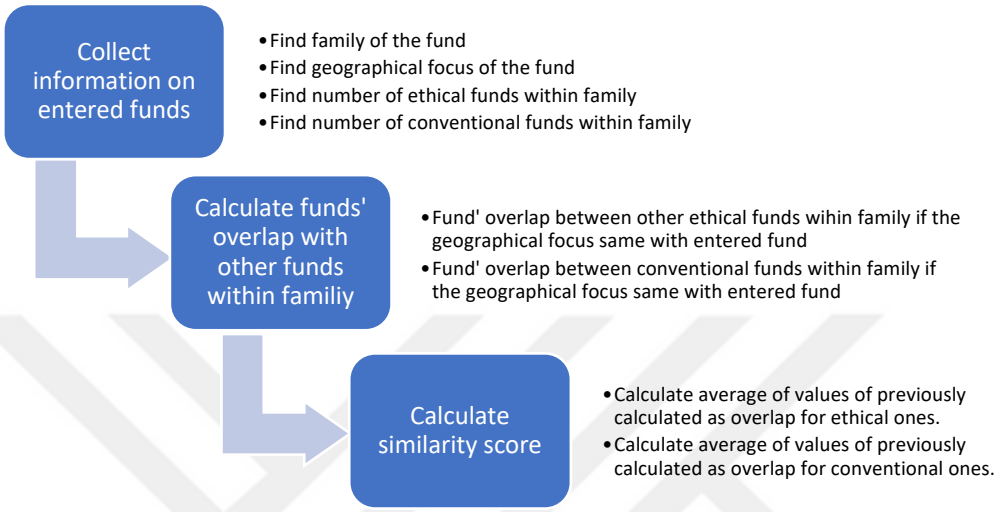


Figure 2: Overlap Similarity with Geographical Focus Calculation Methodology. This figure illustrates the procedure for the generation of similarity scores with geographical focus in three steps. For the collect information on funds step the TR database is used with the help of some macros. For the calculation of fund's overlap values, a special Matlab code is written and used. For the calculation of similarity scores, additional scrip is written in Matlab.

After completing of the enormous computational work for similarity measures, some other dummy variables were defined to be used in regression analyses:

- Focus US dummy variable - used to differentiate whether fund's geographical focus defined as United States or others such as, Global, Europe, United Kingdom etc.
- Being in Ethical Family dummy variable – used to differentiate whether a conventional fund is in a family of funds which also hold ethical fund in their portfolio.

In addition to (no common geographical focus) and (common geographical focus), smaller clusters are created with respect to conventional similarity measures. Those sections are as follows;

- If the conventional similarity score is equal to 0, then the fund is in the ExQuartile section of the related sample.
- If the conventional similarity score is larger than 0, then the fund is in the Quartile section of the related sample.

Additionally, another variable, ‘section’ is defined:

- For all funds in the ExQuartile sample, section is equal to 0.
- For all other funds in the Quartile sample, section is equal to 1, 2, 3, or 4, dividing the Quartile sample quartiles.

Therefore, the section variable ranges between 0 and 4 as a numeric categorical variable.

CHAPTER 4

DESCRIPTIVE STATISTICS AND CHARACTERISTICS OF DATA

This section presents some descriptive statistics regarding the data used in analyses.

Table 2
Descriptive Statistics of the Sample Universe

This table presents descriptive statistics for the various variables that are used in tests on the basis of Sample Universe. Panel A presents descriptive statistics including all funds in Sample Universe. Panel B presents descriptive statistics for ethical funds within Sample Universe. Panel C presents descriptive statistics for conventional funds within Sample Universe.

Panel A. Descriptive Statistics of all Funds in Sample Universe

Variable	N	Min	Max	Mean	Std
Age	5,408	0.00	109.63	13.94	12.12
ESG	5,408	0.00	88.99	53.90	17.93
Number of Assets	5,408	11.00	2000.00	173.12	307.43
Total Assets	5,408	73.71	104.91	99.41	2.39
% Sector Availability of Assets	5,288	0.01	136.19	91.59	12.46
% of Sin Sector in Available Assets	5,288	-1.14	91.21	3.36	3.86
1 Month Performance to Last Day	3,388	-36.08	42.19	4.43	2.86
SEC 1 Year Performance	5,235	-99.99	103.19	-2.31	15.20
Latest Year Minus 1 Performance	3,058	-49.71	22.17	-10.07	7.12
Rel. Performance for 1 Year to Last Month End	3,306	-38.46	32.29	0.46	6.67
Beta for 1 Year to Last Month End	3,278	-12.40	30.31	0.99	0.59
Information Ratio for 1 Year to Last Month End	3,278	-8.01	2.33	-0.13	0.51
Sharpe Ratio for 1 Year to Last Month End	3,281	-0.76	1.89	-0.05	0.19
Treynor Ratio for 1 Year to Last Month End	3,278	-9.26	16.79	-0.38	0.90

Table 2 – *Continued*

Panel B. Descriptive Statistics of Ethical Funds in Sample Universe

Variable	N	Min	Max	Mean	Std
Age	220	0.25	109.63	13.77	12.87
ESG	220	0.00	78.72	58.56	15.36
Number of Assets	220	12.00	2000.00	215.57	391.23
Total Assets	220	88.39	104.50	99.39	2.05
% Sector Availability of Assets	217	43.64	101.54	94.81	7.91
% of Sin Sector in Available Assets	217	0.00	12.52	1.48	2.07
1 Month Performance to Last Day	172	-4.91	9.72	5.02	1.88
SEC 1 Year Performance	209	-51.56	66.72	-2.25	13.80
Latest Year Minus 1 Performance	157	-24.77	12.14	-9.34	6.67
Rel. Performance for 1 Year to Last Month End	165	-14.91	31.28	2.13	6.83
Beta for 1 Year to Last Month End	164	0.53	1.53	1.00	0.13
Information Ratio for 1 Year to Last Month End	164	-0.93	0.79	-0.05	0.37
Sharpe Ratio for 1 Year to Last Month End	164	-0.43	0.36	-0.05	0.13
Treynor Ratio for 1 Year to Last Month End	164	-2.14	1.77	-0.28	0.66

Panel C. Descriptive Statistics of Conventional Funds in Sample Universe

Variable	N	Min	Max	Mean	Std
Age	5188	0.00	95.02	13.94	12.09
ESG	5188	0.00	88.99	53.71	18.01
Number of Assets	5188	11.00	2000.00	171.32	303.29
Total Assets	5188	73.71	104.91	99.41	2.40
% Sector Availability of Assets	5071	0.01	136.19	91.45	12.60
% of Sin Sector in Available Assets	5071	-1.14	91.21	3.44	3.90
1 Month Performance to Last Day	3216	-36.08	42.19	4.40	2.90
SEC 1 Year Performance	5026	-99.99	103.19	-2.31	15.26
Latest Year Minus 1 Performance	2901	-49.71	22.17	-10.11	7.14
Rel. Performance for 1 Year to Last Month End	3141	-38.46	32.29	0.38	6.65
Beta for 1 Year to Last Month End	3114	-12.40	30.31	0.99	0.61
Information Ratio for 1 Year to Last Month End	3114	-8.01	2.33	-0.14	0.52
Sharpe Ratio for 1 Year to Last Month End	3117	-0.76	1.89	-0.05	0.19
Treynor Ratio for 1 Year to Last Month End	3114	-9.26	16.79	-0.38	0.91

In Table 2 above, some findings are observed for Sample Universe that are in accordance with the existing literature:

- Mean ESG value is larger for ethical funds compared to conventional funds.
- Mean % of sin sector availability is lower for ethical funds compared to conventional funds.

In addition, there are some observations that are not expected according to the current literature:

- Ethical funds perform better than conventional funds in terms of the mean of relative performance for 1 year to last month end.
- Ethical funds perform better than conventional funds in terms of the mean of 1 Month performance.

As discussed in the literature review chapter, the superior performance of ethical funds is not expected since typically conventional funds have a better diversification opportunity.

Table 3
Descriptive Statistics of Sample Master

This table presents descriptive statistics for the various variables that are used in tests on the basis of Sample Master. Panel A presents descriptive statistics including all funds in Sample Master. Panel B presents descriptive statistics for ethical funds within Sample Master. Panel C presents descriptive statistics for conventional funds within Sample Master.

Panel A. Descriptive Statistics of all Funds in Sample Universe

Variable	N	Min	Max	Mean	Std
Age	1,571	0.16	109.63	15.39	12.31
ESG	1,571	0.00	84.19	57.64	15.47
Number of Assets	1,571	12.00	2000.00	258.79	422.14
Total Assets	1,571	74.45	104.82	99.39	2.65
% Sector Availability of Assets	1,551	9.69	114.62	93.92	9.04
% of Sin Sector in Available Assets	1,551	0.00	79.60	3.22	3.86
1 Month Performance to Last Day	1,110	-9.98	24.65	4.62	2.28
SEC 1 Year Performance	1,528	-56.41	80.07	-1.93	14.04
Latest Year Minus 1 Performance	1,009	-44.10	17.03	-9.48	6.87
Rel. Performance for 1 Year to Last Month End	1,089	-28.70	31.28	1.03	5.80
Beta for 1 Year to Last Month End	1,082	0.29	1.60	1.00	0.12
Information Ratio for 1 Year to Last Month End	1,082	-4.42	2.33	-0.13	0.46
Sharpe Ratio for 1 Year to Last Month End	1,083	-0.53	1.89	-0.05	0.18
Treynor Ratio for 1 Year to Last Month End	1,082	-3.47	3.40	-0.30	0.73

Table 3 – *Continued*

Panel B. Descriptive Statistics of Ethical Funds in Sample Master

Variable	N	Min	Max	Mean	Std
Age	220	0.25	109.63	13.77	12.87
ESG	220	0.00	78.72	58.56	15.36
Number of Assets	220	12.00	2000.00	215.57	391.23
Total Assets	220	88.39	104.50	99.39	2.05
% Sector Availability of Assets	217	43.64	101.54	94.81	7.91
% of Sin Sector in Available Assets	217	0.00	12.52	1.48	2.07
1 Month Performance to Last Day	172	-4.91	9.72	5.02	1.88
SEC 1 Year Performance	209	-51.56	66.72	-2.25	13.80
Latest Year Minus 1 Performance	157	-24.77	12.14	-9.34	6.67
Rel. Performance for 1 Year to Last Month End	165	-14.91	31.28	2.13	6.83
Beta for 1 Year to Last Month End	164	0.53	1.53	1.00	0.13
Information Ratio for 1 Year to Last Month End	164	-0.93	0.79	-0.05	0.37
Sharpe Ratio for 1 Year to Last Month End	164	-0.43	0.36	-0.05	0.13
Treynor Ratio for 1 Year to Last Month End	164	-2.14	1.77	-0.28	0.66

Panel C. Descriptive Statistics of Conventional Funds in Sample Master

Variable	N	Min	Max	Mean	Std
Age	1351	0.16	92.62	15.65	12.21
ESG	1351	0.00	84.19	57.49	15.49
Number of Assets	1351	12.00	2000.00	265.83	426.68
Total Assets	1351	74.45	104.82	99.39	2.74
% Sector Availability of Assets	1334	9.69	114.62	93.78	9.21
% of Sin Sector in Available Assets	1334	0.00	79.60	3.50	4.01
1 Month Performance to Last Day	938	-9.98	24.65	4.55	2.34
SEC 1 Year Performance	1319	-56.41	80.07	-1.88	14.09
Latest Year Minus 1 Performance	852	-44.10	17.03	-9.50	6.90
Rel. Performance for 1 Year to Last Month End	924	-28.70	26.26	0.83	5.58
Beta for 1 Year to Last Month End	918	0.29	1.60	0.99	0.12
Information Ratio for 1 Year to Last Month End	918	-4.42	2.33	-0.14	0.47
Sharpe Ratio for 1 Year to Last Month End	919	-0.53	1.89	-0.04	0.19
Treynor Ratio for 1 Year to Last Month End	918	-3.47	3.40	-0.30	0.74

The noteworthy observations in Table 3 are as follows:

- Mean ESG values of ethical only and conventional only portions seem quite similar to each other.
- Mean % of sin sector availability results are similar to what is observed for the Sample Universe.

- In relative performance metrics, ethical funds still exhibit superior performance compared to conventional funds.
- In short term performance metrics, ethical and conventional funds do not seem to have a notable difference from each other.

Table 4
Descriptive Statistics of Sample ExFocus

This table presents descriptive statistics for the various variables that are used in tests on the basis of Sample ExFocus. Panel A presents descriptive statistics including all funds in Sample ExFocus. Panel B presents descriptive statistics for funds with no conventional funds within the same family (i.e. excluded quartile) within Sample ExFocus. Panel C presents descriptive statistics for funds with at least one conventional fund within the same family (i.e. included quartile) within Sample ExFocus.

Panel A. Descriptive Statistics of all Funds in Sample ExFocus

Variable	N	Min	Max	Mean	Std
Age	220	0.25	109.63	13.77	12.87
ESG	220	0.00	78.72	58.56	15.36
Overlap Likeness Ethical	220	0.00	65.97	8.75	10.82
Overlap Likeness Conventional	220	0.00	86.58	6.20	10.27
Asset Likeness Ethical	220	0.00	72.34	11.07	12.73
Asset Likeness Conventional	220	0.00	90.00	7.70	12.03
Total Assets	220	88.39	104.50	99.39	2.05
% Sector Availability of Assets	217	43.64	101.54	94.81	7.91
% of Sin Sector in Available Assets	217	0.00	12.52	1.48	2.07
1 Month Performance to Last Day	172	-4.91	9.72	5.02	1.88
SEC 1 Year Performance	209	-51.56	66.72	-2.25	13.80
Latest Year Minus 1 Performance	157	-24.77	12.14	-9.34	6.67
Relative Performance for 1 Year to Last Month End	165	-14.91	31.28	2.13	6.83
Beta for 1 Year to Last Month End	164	0.53	1.53	1.00	0.13
Information Ratio for 1 Year to Last Month End	164	-0.93	0.79	-0.05	0.37
Sharpe Ratio for 1 Year to Last Month End	164	-0.43	0.36	-0.05	0.13
Treynor Ratio for 1 Year to Last Month End	164	-2.14	1.77	-0.28	0.66

Table 4 – *Continued*

Panel B. Descriptive Statistics of Excluded Quartile Part of Sample ExFocus

Variable	N	Min	Max	Mean	Std
Age	85	0.25	109.63	13.40	15.48
ESG	85	0.00	77.81	57.66	16.52
Overlap Likeness Ethical	85	0.00	22.07	5.89	5.37
Overlap Likeness Conventional	85	0.00	0.00	0.00	0.00
Asset Likeness Ethical	85	0.00	32.82	8.66	8.24
Asset Likeness Conventional	85	0.00	0.00	0.00	0.00
Total Assets	85	91.83	104.50	99.78	1.28
% Sector Availability of Assets	83	43.64	100.32	93.17	11.14
% of Sin Sector in Available Assets	83	0.00	7.37	0.92	1.50
1 Month Performance to Last Day	68	-0.05	7.77	5.06	1.47
SEC 1 Year Performance	76	-51.56	66.72	-1.44	15.85
Latest Year Minus 1 Performance	60	-19.67	5.04	-10.00	4.89
Relative Performance for 1 Year to Last Month End	62	-6.41	21.46	2.44	6.02
Beta for 1 Year to Last Month End	62	0.53	1.53	0.98	0.16
Information Ratio for 1 Year to Last Month End	62	-0.93	0.71	-0.02	0.34
Sharpe Ratio for 1 Year to Last Month End	62	-0.25	0.36	-0.05	0.11
Treynor Ratio for 1 Year to Last Month End	62	-1.18	1.61	-0.27	0.57

Panel C. Descriptive Statistics of Included Quartile Part of Sample ExFocus

Variable	N	Min	Max	Mean	Std
Age	135	0.50	61.13	13.99	10.98
ESG	135	0.00	78.72	59.12	14.62
Overlap Likeness Ethical	135	0.00	65.97	10.56	12.83
Overlap Likeness Conventional	135	0.00	86.58	10.11	11.51
Asset Likeness Ethical	135	0.00	72.34	12.59	14.70
Asset Likeness Conventional	135	0.18	90.00	12.55	13.23
Total Assets	135	88.39	103.65	99.15	2.38
% Sector Availability of Assets	134	80.22	101.54	95.83	4.74
% of Sin Sector in Available Assets	134	0.00	12.52	1.82	2.29
1 Month Performance to Last Day	104	-4.91	9.72	4.99	2.11
SEC 1 Year Performance	133	-44.22	35.16	-2.72	12.52
Latest Year Minus 1 Performance	97	-24.77	12.14	-8.93	7.56
Relative Performance for 1 Year to Last Month End	103	-14.91	31.28	1.94	7.29
Beta for 1 Year to Last Month End	102	0.79	1.32	1.02	0.11
Information Ratio for 1 Year to Last Month End	102	-0.85	0.79	-0.06	0.39
Sharpe Ratio for 1 Year to Last Month End	102	-0.43	0.31	-0.06	0.13
Treynor Ratio for 1 Year to Last Month End	102	-2.14	1.77	-0.29	0.71

For Table 4 above and Table 5 below, all funds sections are identical except for the calculated likeness values. On the other hand, excluded quartile and included quartile parts differ from each other since calculated likeness values are different.

For both and , as a surprising finding, it is seen that the similarity of ethical funds with the conventional family members is quite close to their similarity with other ethical family members. Note that, this observation is further analyzed in the following chapters.

Table 5
Descriptive Statistics of Sample InFocus

This table presents descriptive statistics for the various variables that are used in tests on the basis of Sample InFocus. Panel A presents descriptive statistics including all funds in Sample InFocus. Panel B presents descriptive statistics for funds with no conventional fund with similar geographical focus within the same family (i.e. excluded quartile) within Sample Master. Panel C presents descriptive statistics for funds with at least one conventional fund with similar geographical focus within the same family (i.e. included quartile) within Sample InFocus.

Panel A. Descriptive Statistics of all Funds in Sample InFocus

Variable	N	Min	Max	Mean	Std
Age	220	0.25	109.63	13.77	12.87
ESG	220	0.00	78.72	58.56	15.36
Overlap Likeness Ethical	220	0.00	65.97	8.75	10.82
Overlap Likeness Conventional	220	0.00	86.58	6.20	10.27
Asset Likeness Ethical	220	0.00	72.34	11.07	12.73
Asset Likeness Conventional	220	0.00	90.00	7.70	12.03
Total Assets	220	88.39	104.50	99.39	2.05
% Sector Availability of Assets	217	43.64	101.54	94.81	7.91
% of Sin Sector in Available Assets	217	0.00	12.52	1.48	2.07
1 Month Performance to Last Day	172	-4.91	9.72	5.02	1.88
SEC 1 Year Performance	209	-51.56	66.72	-2.25	13.80
Latest Year Minus 1 Performance	157	-24.77	12.14	-9.34	6.67
Relative Performance for 1 Year to Last Month End	165	-14.91	31.28	2.13	6.83
Beta for 1 Year to Last Month End	164	0.53	1.53	1.00	0.13
Information Ratio for 1 Year to Last Month End	164	-0.93	0.79	-0.05	0.37
Sharpe Ratio for 1 Year to Last Month End	164	-0.43	0.36	-0.05	0.13
Treynor Ratio for 1 Year to Last Month End	164	-2.14	1.77	-0.28	0.66

Table 5 – *Continued*

Panel B. Descriptive Statistics of Excluded Quartile Part of Sample InFocus

Variable	N	Min	Max	Mean	Std
Age	109	0.25	109.63	12.90	14.27
ESG	109	0.00	77.81	57.02	17.34
Overlap Likeness Ethical	109	0.00	68.11	7.70	12.40
Overlap Likeness Conventional	109	0.00	0.00	0.00	0.00
Asset Likeness Ethical	109	0.00	80.70	10.86	15.87
Asset Likeness Conventional	109	0.00	0.00	0.00	0.00
Total Assets	109	91.31	104.50	99.71	1.41
% Sector Availability of Assets	106	43.64	101.54	93.42	10.09
% of Sin Sector in Available Assets	106	0.00	9.34	1.17	1.84
1 Month Performance to Last Day	83	-0.05	9.09	5.03	1.59
SEC 1 Year Performance	100	-51.56	66.72	-3.86	16.22
Latest Year Minus 1 Performance	75	-24.77	5.04	-10.29	5.50
Relative Performance for 1 Year to Last Month End	77	-14.91	21.46	2.24	6.50
Beta for 1 Year to Last Month End	77	0.53	1.53	0.99	0.15
Information Ratio for 1 Year to Last Month End	77	-0.93	0.71	-0.04	0.35
Sharpe Ratio for 1 Year to Last Month End	77	-0.31	0.36	-0.05	0.12
Treynor Ratio for 1 Year to Last Month End	77	-2.13	1.61	-0.30	0.60

Panel C. Descriptive Statistics of Included Quartile Part of Sample InFocus

Variable	N	Min	Max	Mean	Std
Age	111	0.50	61.13	14.61	11.34
ESG	111	25.32	78.72	60.06	13.04
Overlap Likeness Ethical	111	0.00	74.88	13.77	19.58
Overlap Likeness Conventional	111	0.01	86.58	15.06	14.44
Asset Likeness Ethical	111	0.00	86.76	16.58	22.79
Asset Likeness Conventional	111	0.63	90.00	20.30	17.60
Total Assets	111	88.39	103.65	99.08	2.49
% Sector Availability of Assets	111	80.22	100.56	96.14	4.71
% of Sin Sector in Available Assets	111	0.00	12.52	1.77	2.24
1 Month Performance to Last Day	89	-4.91	9.72	5.01	2.12
SEC 1 Year Performance	109	-25.70	35.16	-0.78	11.01
Latest Year Minus 1 Performance	82	-23.87	12.14	-8.47	7.52
Relative Performance for 1 Year to Last Month End	88	-13.64	31.28	2.03	7.13
Beta for 1 Year to Last Month End	87	0.79	1.30	1.01	0.11
Information Ratio for 1 Year to Last Month End	87	-0.85	0.79	-0.06	0.39
Sharpe Ratio for 1 Year to Last Month End	87	-0.43	0.31	-0.05	0.13
Treynor Ratio for 1 Year to Last Month End	87	-2.14	1.77	-0.27	0.71

CHAPTER 5

METHODOLOGY AND MODEL CONSTRUCTION

5.1. Binary Models for Understanding General Behavior

Binary (simple regression) models are generated to analyze collected and generated data and understand its characteristics. The dependent variables are ESG score, 1 Year Relative Performance and Percentage of Sin. The reasoning for the selection of these dependent variables can be explained as follows:

- ESG Score: As discussed in the literature review section, most ethical investment strategies are based on the ESG scores of assets. Therefore, it is important to see how the ESG score of a fund is affected by the similarity scores and other variables of interest.
- 1 Year Relative Performance: There is a strong consensus in the literature that being ethical or socially responsible creates less revenue / gain compared to more conventional investments. The following analyses will test to see whether this hypothesis is true.
- Percentage of Sin: This dependent variable makes it possible to see whether ethical funds indeed hold a smaller percentage of sin assets in their portfolios and whether conventional funds have a better diversification opportunity since they are not concerned about excluding sin industries from their portfolios.

The independent variables for the models are as follows:

- Ethical / Conventional Flag is selected to understand the effect of being ethical or conventional on the dependent variables above.

- Being in an Ethical Family dummy variable is selected to understand wheter a fund family's overall characteristics is affected from the inclusion of ethical funds.
- Overlap similarity measures are selected to understand their impact on the ESG and financial performance of the funds.

Note that, these relations are analyzed and presented for different sample groups in the results and discussion part.

5.2. Regression Models for Understanding Data

In order to understand and explain the attributes of the different samples and correlation of the different variables, multiple regression models are used. For this purpose, the same dependent variables as the binary models are used. Also, a number of additional independent variables are selected to answer some additional questions. These independent variables are as follows:

- Active / Retired Flag $AR\ (binary\ variable)$
- Age of the fund $AGE\ (scalar\ variable)$
- Ethical / Conventional Flag $EC\ (binary\ variable)$
- Focus US dummy variable $FU\ (binary\ variable)$
- ESG Score $ESG\ (scalar\ variable)$
- Percentage of Sin $\eta_{sin}\ (scalar\ variable)$
- 1 Month Performance to Last Day $P_{st}\ (scalar\ variable)$
- Latest Year Minus 1 Performance $P_{lt}^{-1}\ (scalar\ variable)$
- Relative Perf. for 1 Year to Last Month End $P_{lt}^{rel}\ (scalar\ variable)$
- Section SEC $(scalar\ variable)$
- Overlap Likeness Conventional $OL_c\ (scalar\ variable)$
- Overlap Likeness Ethical $OL_e\ (scalar\ variable)$

Before running the regression analyses, correlations of the binary variables are also checked, and highly correlated independent variables are not included in the same

regression models. Also note that, correlation tables for all samples are presented in the Appendices. Additionally, some variables are not available for different samples. For example, similarity variables are only included in the and . Therefore, one simple generic formulation that is estimated within a regression framework using SPSS can be presented as follows.

For the ESG Score dependent variable;

$$ESG = f(AR, AGE, EC, FU, \eta_{sin}, P_{st}, P_{lt}^{-1}, SEC, OL_c, OL_e)$$

For the 1 Year Relative Performance dependent variable;

$$P_{lt}^{rel} = f(AR, AGE, EC, FU, ESG, \eta_{sin}, SEC, OL_c, OL_e)$$

For the Percentage of Sin dependent variable;

$$\eta_{sin} = f(AR, AGE, EC, FU, ESG, P_{st}, P_{lt}^{-1}, SEC, OL_c, OL_e)$$

5.3. Some Examples to Visualize Similarity of Mutual Funds within Families

As explained in the previous sections, the main contribution of this thesis to the literature is the consideration of similarity measures within correlations or regression models. In order to understand the differences between families, one could make use of colormap figures as follows.

In Figure 3, a colormap of an example fund family is presented. This fund family consists of a total of 6 funds. The last 2 of these funds (#5 and #6) are conventional funds whereas the first 4 funds (#1, #2, #3 and #4) are ethical funds. Values presented in boxes are the overlap values for the funds that appear in the column versus the row that intersects at that box. For example, at the cross section of row 1 and column 2 the overlap value of the fund #1 and fund #2 is presented. Ethical funds are expected to have higher overlap values with other ethical funds and lower overlap values with conventional funds in the same family. Similarly, conventional funds are expected to have higher overlap values with other conventional funds and lower overlap values with ethical funds in the same family. In other words, overlap values in the northwest and southeast quadrants are expected to be higher and overlap

values in the northeast and southwest quadrants are expected to lower. The colormap presents higher overlap values with yellows and lower overlap values with blues.



Figure 3: Expected Colormap of Overlap Similarity Values of an Example Fund. This figure illustrates similarity between funds in terms of percentage portfolio overlap values in a colored fashion. Each number in a row and a column indicates a unique fund within the same family. At their intersection, asset overlap values are presented as percentage of portfolio overlap. Accordingly, cells are colored with respect to the color bar. In this fund family, first 4 funds are were defined as ethical, last 2 funds were defined as conventional.

Some fund families may exhibit different attributes. In Figure 4, a hypothetical fund family with 5 ethical and 4 conventional funds is presented by using a colormap:

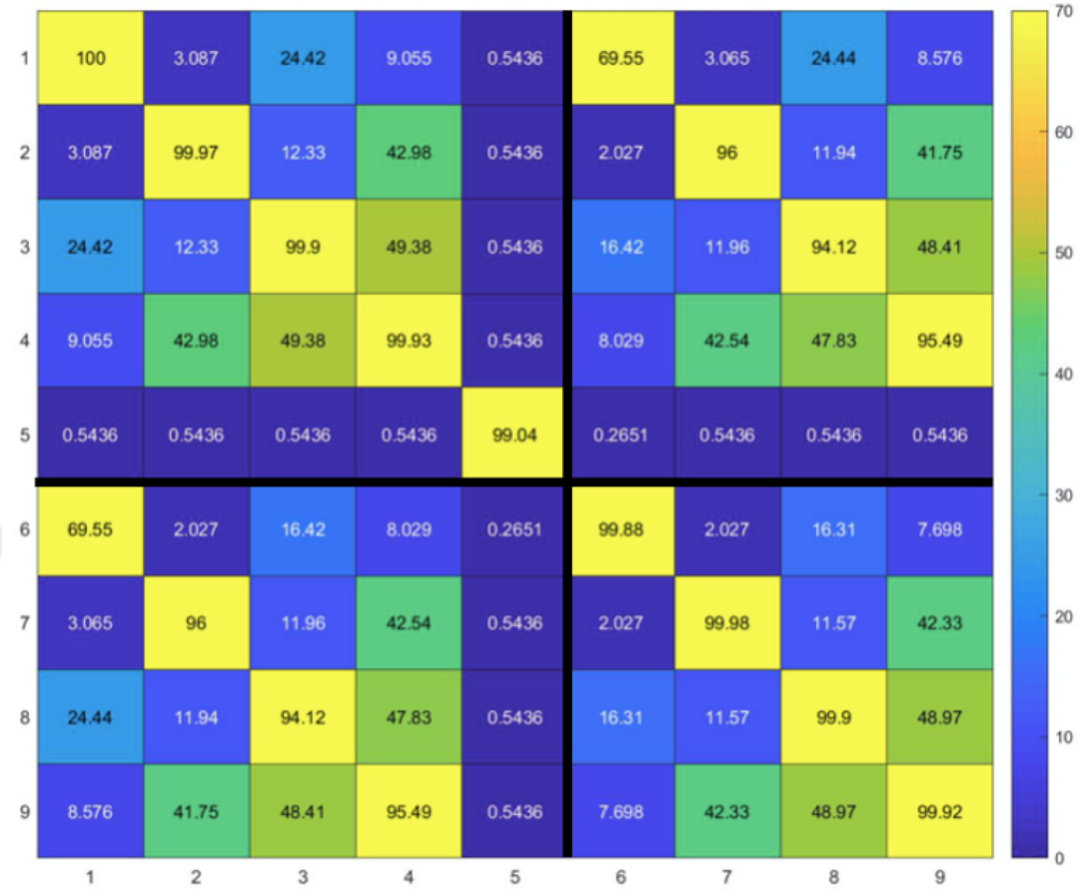


Figure 4: Unexpected Colourmap of Overlap Similarity Values of an Example Fund. This figure illustrates similarity between funds in terms of percentage portfolio overlap values in a colored fashion. Each number in a row and a column indicates a unique fund within the same family. At their intersection, asset overlap values are presented as percentage of portfolio overlap. Accordingly, cells are colored with respect to the color bar. In this fund family, first 5 funds are were defined as ethical, last 4 funds were defined as conventional.

These funds overlap values presented in Figure 4 are unexpected, since their distinction of being ethical and conventional seems to have no effect on the asset selection behavior of the fund managers. With these overlap values, within this family, the fund managers tend to invest in similar assets. This is an unexpected result, the distinction of being ethical or conventional should be effecting asset selections.

In Figure 4, some funds tend to have similar overlap values with their ethical and conventional counterparts. For example, fund #4 has quite high overlap values with the other ethical funds (9.06%, 42.98%, 49.38%) but also with the conventional

funds in the same family (42.54%, 47.83%, 95.49%). This colormap implies that being ethical or conventional may not have a significant effect on asset selection.

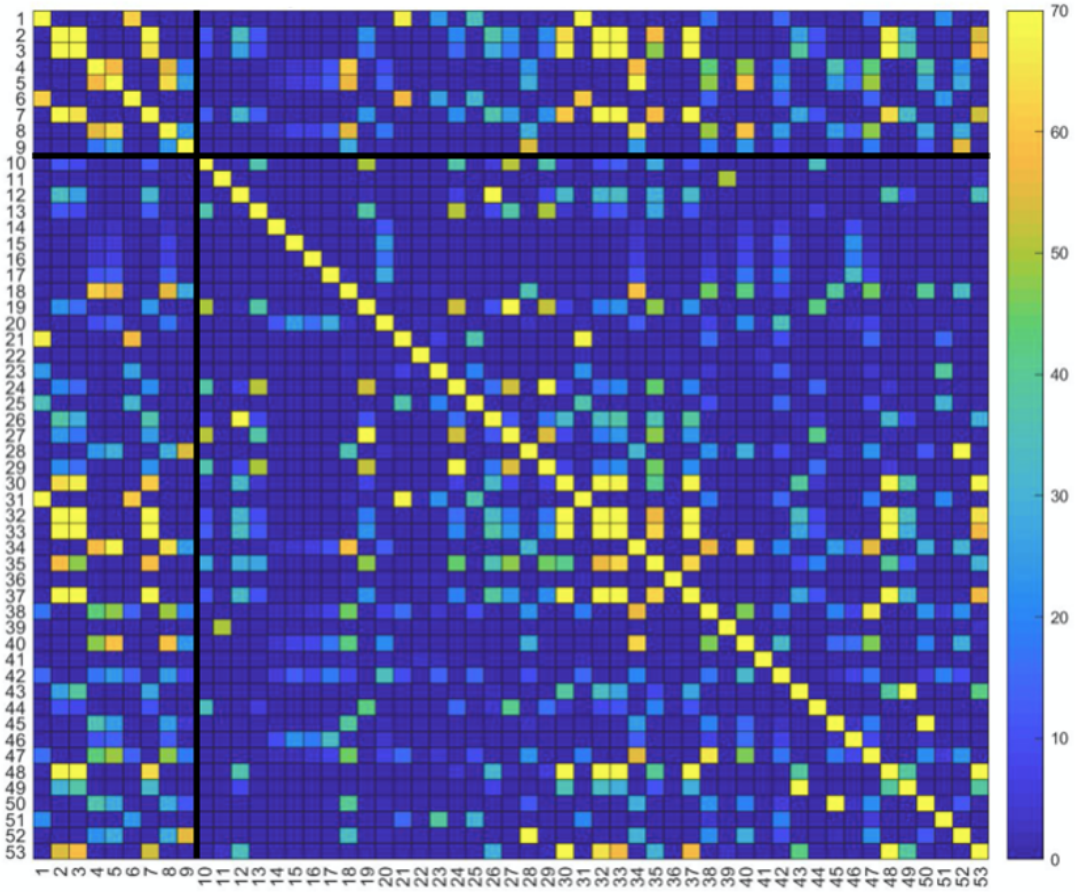


Figure 5: Mostly Frequently Observed Colourmap of Overlap Similarity Values of an Example Fund. This figure illustrates similarity between fund's percentage portfolio overlap values in a colored fashion. Each number in rows and columns indicates a unique fund within family. At their intersection, asset overlap values are presented as percentage of portfolio overlap. Accordingly, cells are colored with respect to color bar. In this fund family, first 9 funds are were defined as ethical, last 44 fund were defined as conventional.

The most commonly observed results for fund families is presented in Figure 5. These types of colormaps raises the question of whether the asset selection of the funds is dependent on the characteristics of the funds or only on the family's asset selection behavior. These points are revisited while discussing the empirical results in the next section.

CHAPTER 6

EMPRICAL RESULTS AND DISCUSSION

6.1. Binary Results

In this section, hypotheses tests based on binary (simple regression) models are presented. These tests are means tests for group variables and regression tests for scalar variables. Also note that the mentioned tests are conducted using SPSS.

6.1.1. Ethical / Conventional Variable's Effect Over Dependent Variables

Let us consider the effect of the Ethical / Conventional dummy variable on the ESG score for both Sample Universe and Sample Master.

Please note that the null hypothesis for ESG is follows:

$$H_0: ESG = f(EC)$$

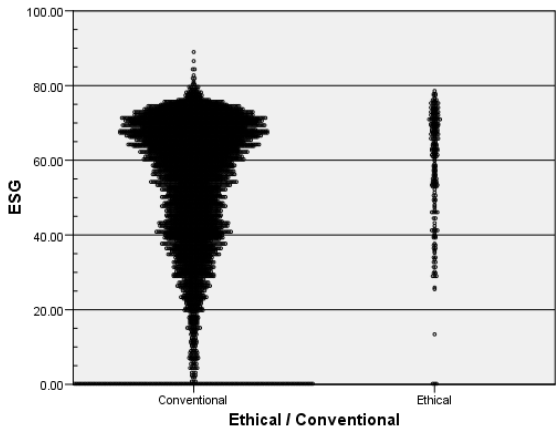


Figure 6: ESG vs Ethical / Conventional - Sample Universe. This figure presents the distribution of ESG scores on the vertical axis with the classification as being ethical or conventional on horizontal axis for funds in Sample Universe. This figure also illustrates the general ESG trend of the Sample Universe.

In Figure 6, the distribution of the ESG values of the funds is presented. The distribution shows that the ESG of the ethical funds is higher compared to the conventional funds. In order to be sure about these results, an ANOVA test is conducted in SPSS. The result is as follows:

Table 6
ANOVA of ESG vs EC - Sample Universe

This table presents ANOVA test results for the relationship between ESG and EC variables within Sample Universe.

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4,962.707	1	4,962.707	15.470	0.000
Within Groups	1,734,241.578	5,406	320.799		
Total	1,739,204.284	5,407			

ANOVA results in Table 6 show that ESG is a function of EC and is positively correlated with being ethical (EC=1). In other words, if a fund is designated as ethical, then its ESG value is likely to be larger than a conventional fund.

From this point forward, the same method is used to understand the differences that come with being ethical versus conventional.

Table 7
Ethical / Conventional Independent Variable's Effect over Dependent Variables

This table presents ethical / conventional (EC) independent variable's effect over various dependent variables. Column A. presents the expected relationship (null hypothesis) between the dependent and independent variable. Column B. presents results for Sample Universe. Column C presents results for Sample Master. (+) sign refers to the result that there is a significant positive correlation between the variables. (-) sign refers to the result that there is a significant negative correlation between the variables. (N/S) refers to the result that there is no significant correlation between the variables.

Dependent Variables	*Column A. Expected Relationship (Null Hypothesis)*	*Column B. Correlation Results within Sample Universe*	*Column C. Correlation Results within Sample Master*
ESG	(+)	(+)	N/S
1 Year Relative Performance	(-)	(+)	(+)
Percentage of Sin	(-)	(-)	(-)

In Table 7, the column of Null Hypothesis indicates the expected relationship between the independent variable and related dependent variables. The following identification is used throughout the thesis for similar tables.

- (+) indicates that the expected relationship is significantly positive.
- (-) indicates that the expected relationship is significantly negative.
- (N/S) indicates that no significant relationship is found.
- (N/A) indicates that no significant relationship is expected between the variables.
- (-N-A-) indicates that given relationship is not applicable for given regression model. For instance, the independent variable may not be available for the indicated sample.
- (---) sign indicates that the given relationship is not considered. This consideration is for those cases where the correlations are extremely large

The following results from Table 7 are presented based on the convention described above:

- Being ethical versus conventional significantly positively affects the ESG score in the Sample Universe. On the other hand, for the Sample Master, there is no significant relationship. This result might indicate that if a family of fund has at least one ethical fund in its portfolio, other funds of the same family have similar ESG scores.
- Being an ethical fund is considered as less favorable in the current literature since selection of assets is within a smaller cluster which creates less opportunity for diversification. Therefore, ethical funds are expected to have lower returns compared to conventional funds. For both samples, being ethical seems to create more value for investors.
- For both samples ethical funds seem to hold a smaller percentage of sin industry stocks, as expected in the literature. In other words, being ethical is affecting the fund's selection of assets as avoiding investing in sin assets.

6.1.2. Being in Ethical Family Flag's Effect Over Dependent Variables

This flag is generated for only conventional funds. It means that the given fund is a member of a fund family which also includes at least one ethical fund. This flag variable is expected to have no significant effect on the dependent variables. Tthis flag's effects are only considered within the Sample Universe's conventional fund section. Results are presented in Table 8.

Table 8
Being in Ethical Family Flag's Effect Over Dependent Variables

This table presents being in ethical flag independent variable's effect over various depended variables. Column A. presents expected relationship (null hypothesis) between depended and independent variable. Column B. presents results for part of which only includes conventional funds of Sample Universe. (+) sign refers to the result that there is a significant positive correlation between the variables. (-) sign refers to the result that there is a significant negative correlation between the variables. (N/S) refers to the result that there is no significant correlation between the variables .

Dependent Variables	*Column A. Expected Relationship (Null Hypothesis)*	*Column B. Correlation Results within Sample Universe Except Ethical Funds*
ESG	(+)	(+)
1 Year Relative Performance	(-)	(+)
Percentage of Sin	(-)	(N/S)

The following results are observed in Table 8.

- Conventional fund ESG scores are significantly positively affected if the family of the fund also holds an ethical fund in their portfolio. This result might signal that within the same family conventional fund managers tend to select similar assets with ethical funds.
- For relative performance, if conventional fund is a member of a family which also have ethical funds, then the conventional fund performs significantly better than other ones. This attribute is also in line with the result of being

ethical creating higher relative performance as mentioned in the previous section.

- For Percentage of Sin, the result comes out as expected. Being in an ethical family does not have a significant effect over avoiding sin stocks.

6.1.3. Overlap Likeness Conventional Variable's Effect Over Dependent Variables

As it was stated before, Overlap Likeness Conventional similarity measure is calculated only for ethical funds. Therefore, this measure is used only in the tests for Sample ExFocus and Sample InFocus. The effect of overlap likeness conventional value is also considered in the sample's quartiles sections as well. Note that, quartile sections are being created with eliminating the measure's 0 values from sample. In other words, if an ethical fund has no conventional fund within their family for Sample ExFocus, that fund is eliminated from the sample. Similarly, if an ethical fund has no conventional fund with the same focus in their family for Sample InFocus, that fund is eliminated from the sample.

Related results for independent variable's effect over dependent variable are presented below. Note that, this table indicates the correlation coefficient between variables and the associated p-values right below the coefficient.

Table 9
Overlap Likeness Conventional Variable's Effect Over Dependent Variables

This table presents overlap likeness conventional variable's effect over various depended variables. Column A. presents expected relationship (null hypothesis) between depended and independent variable. Column B. presents results for Sample ExFocus. Column C present results for quartile part of Sample ExFocus. Column D. presents result for Sample InFocus. Column E. presents results for quartile part of Sample InFocus. (+) sign refers to the result that there is a significant positive correlation between the variables. (-) sign refers to the result that there is a significant negative correlation between the variables. (N/S) refers to the result that there is no significant correlation between the variables. If any significant correlation exists between variables, the correlation coefficient is presented. Right below the correlation coefficient, the p-value of this correlation is presented.

Dependent Variables	*Column A. Expected Relationship (Null Hypothesis)*	*Column B. Correlation Results within Sample ExFocus*	*Column C. Correlation Results within Quartile Part of Sample ExFocus*	*Column D. Correlation Results within Sample InFocus*	*Column E. Correlation Results within Quartile part of Sample InFocus*
ESG	(-)	0.236 (0.025)	0.263 (0.043)	0.181 (0.023)	0.170 (0.035)
1 Year Relative Performance	(+)	0.110 (0.030)	0.154 (0.065)	(N/S)	(N/S)
Percentage of Sin	(+)	0.027 (0.018)	(N/S)	0.030 (0.034)	(N/S)

The following findings are implied by Table 9:

- The overlap likeness conventional values is expected to have a negative correlation with the ESG score. Since conventional funds are not obliged to select ethical assets, their ESG scores are expected to be lower than ethical funds. However, the results suggest otherwise for the mentioned samples. ESG score is significantly correlated with the overlap likeness conventional measure. In other words, if a fund is investing in similar assets with conventional funds' holdings, the fund's score also tends to be higher.
- 1 Year Relative performance results are expected to be positively correlated with similarity between conventional members of the fund family since conventional funds have more opportunity to diversify their portfolio to manage their risks. For Sample ExFocus this assumption holds. But, for Sample InFocus no significant correlation is observed with ethical fund performance.

- Percentage of Sin is expected to increase as the similarity between conventional funds increases since conventional funds have no restrictions on investing in sin assets. The results show that there is indeed a statistically significant positive correlation between those variables. The results might imply that as similarity between conventional members increases, the fund's tendency to invest in sin assets also increases.

6.1.4. Overlap Likeness Ethical Variable's Effect Over Dependent Variables

Overlap Likeness Ethical measure's effect over dependent variables is analyzed for Sample ExFocus and Sample InFocus. These results and their relevant hypotheses are presented in Table 10.

Table 10
Overlap Likeness Ethical Variable's Effect Over Dependent Variables

This table presents overlap likeness ethical variable's effect over various dependent variables. Column A. presents the expected relationship (null hypothesis) between the dependent and independent variables. Column B. presents results for Sample ExFocus. Column C. presents result for Sample InFocus. (N/A) implies that there is no expected relationship between variables. (N/S) refers to the result that there is no significant correlation between variables. If any significant correlation exists between variables, the correlation coefficient is presented. Right below the correlation coefficient, the p-value of this correlation is presented.

Dependent Variables	*Column A. Expected Relationship (Null Hypothesis)*	*Column B. Correlation Results within Sample ExFocus*	*Column C. Correlation Results within Sample InFocus*
ESG	(+)	(N/S)	(N/S)
1 Year Relative Performance	(-)	0.144 (0.061)	(N/S)
Percentage of Sin	(-)	0.236 (0.050)	(N/S)

The findings in Table 10 are as follows:

- The overlap likeness of an ethical fund with the other ethical funds in the same family is not significantly correlated with any of the independent variables when these funds are compared within a sample of common geographical focus.
- When ethical funds are compared within a sample of no common geographical focus, the 1-year relative performance is significantly and positively correlated with the overlap likeness measure. This result may imply that as similarity increases between family members, performance of the funds also collectively increases. In the previous section, overlap similarity conventional was also positively correlated with performance in the ExFocus sample.
- Similarly, when ethical funds are compared within a sample of no common geographical focus, the percentage of sin is significantly and positively correlated with the overlap likeness measure. This result implies that even though the funds have different geographical focus, their screening of sin industries is similar to each other within the same family of funds.

6.2. Regression Results

In this section, multiple regression results are presented. All regressions were estimated in SPSS with constraint of $p<0.05$. Throughout this section, for all regressions, R squared values are presented as evidence of model success. Also note that, before running the regressions, all pairwise correlations are calculated, and some independent variables are excluded from the models whenever there is a risk of multicollinearity as a result of high correlation.

6.2.1. ESG Regressions

The following regression model is estimated for the dependent variable ESG:

$$ESG = f(AR, AGE, EC, FU, \eta_{sin}, P_{st}, P_{lt}^{-1}, SEC, OL_c, OL_e)$$

The independent variables in this model are defined as before. Estimation results are presented in Table 11. The following are the hypotheses regarding the relationships in this model:

- AR's (active/retired flag) effect over ESG is expected to be positive assuming that active funds may choose to invest in higher-ESG stocks as a result of the increased popularity of these stocks.
- AGE, FU (US focus) and OL_e (similarity of ethical funds with other ethical funds) are not expected to significantly affect the ESG of the portfolio.
- EC (ethical flag) is expected to have a significant and positive correlated relationship with ESG since ethical funds are more willing to select higher ESG stocks.
- η_{sin} is expected to have a significant and negative correlation with ESG since as the η_{sin} increases, the possibility of having higher ESG decreases.
- Both performance variables (P_{st} & P_{lt}^{-1}) are expected to have a negative correlation with ESG since ethical funds have less opportunity to diversify their portfolios as a result of having to select stocks from a narrower range.
- Please note that P_{lt}^{-1} is the previous year's performance. It is also argued in the literature that superior performance in the previous year may encourage fund managers to invest in higher-ESG assets in the current year. As a result, the sign of the P_{lt}^{-1} variable may be positive or negative.
- For the similarity measures, OL_c and SEC are both expected to have a significant and negative correlation with ESG since as similarity to conventional funds increases, the ESG score is so expected to decrease.

Table 11
ESG Regression Results

This table presents results for regression results within different samples with ESG as the dependent variable. The first column presents the independent variables. Column A. presents the expected relationship (null hypothesis) between the variables. Column B. presents results for Sample Universe. Column C. presents results for Sample Master. Column D. presents results for Sample ExFocus. Column E. presents results for the quartile part of Sample ExFocus. Column F. presents results for the excluded quartile part of Sample ExFocus. Column G. presents results for Sample InFocus. Column H. presents results for the quartile part of Sample InFocus. Column I. presents results for the excluded quartile part of Sample InFocus. (---) implies no expected relationship or the independent variable was not used in the regression. (+) implies that a positive correlation is expected. (-) implies that a negative correlation is expected. (N/S) indicates that there is no significant correlation between the variables. (-N-A-) indicates that the variable is not applicable to be used in the model. Numbers are correlation coefficients between ESG and the independent variable.

Independent Variable	Column A. Expected Results for Correlations (Null Hypothesis)	Column B. Regression Results for Sample Universe	Column C. Regression Results for Sample Master	Column D. Regression Results for Sample ExFocus	Column E. Regression Results for Quartile part of Sample ExFocus	Column F. Regression Results for Excluded Quartile part of Sample ExFocus	Column G. Regression Results for Sample InFocus	Column H. Regression Results for Quartile part of Sample InFocus	Column I. Regression Results for Excluded Quartile part of Sample InFocus
$\boldsymbol{c}$	(---)	57.25	64.432	43.884	33.348	71.833	58.344	35.127	63.521
$\boldsymbol{AR}$	(+)	(N/S)	(N/S)	15.68	13.178	(---)	16.467	14.288	(---)
$\boldsymbol{AGE}$	(---)	0.119	0.071	(N/S)	(---)	(N/S)	(N/S)	(N/S)	(N/S)
$\boldsymbol{EC}$	(+)	4.345	(N/S)	(-N-A-)	(-N-A-)	(-N-A-)	(-N-A-)	(-N-A-)	(-N-A-)
$\boldsymbol{FU}$	(---)	-3.466	-3.222	(N/S)	(N/S)	(N/S)	(N/S)	(N/S)	(N/S)
$\boldsymbol{\eta_{sin}}$	(-)	0.509	0.458	-1.246	(N/S)	-2.176	-1.245	(N/S)	-2.775
$\boldsymbol{P_{st}}$	(-)	0.797	(N/S)	(N/S)	(N/S)	(N/S)	(---)	(N/S)	(---)
$\boldsymbol{P_{lt}^{-1}}$	(+/-)	0.641	0.596	(N/S)	(N/S)	0.85	(N/S)	(N/S)	(N/S)
$\boldsymbol{SEC}$	(-)	(-N-A-)	(-N-A-)	2.028	5.388	(-N-A-)	2.209	4.741	(-N-A-)
$\boldsymbol{OL_c}$	(-)	(-N-A-)	(-N-A-)	(N/S)	(N/S)	(-N-A-)	(N/S)	(---)	(-N-A-)
$\boldsymbol{OL_e}$	(---)	(-N-A-)	(-N-A-)	(-N-A-)	(N/S)	0.643	(-N-A-)	(-N-A-)	(N/S)
Regression R-squared		0.122	0.097	0.095	0.227	0.166	0.102	0.214	0.151

The following results are observed in Table 11.

- Being active has a significant effect on the fund's average ESG in Sample ExFocus and Sample InFocus implying that active ethical funds tend to select assets with higher ESG scores. It may also imply that over time ESG scores of stocks may have increased and funds that retired in earlier years may have had to choose from stocks with relatively lower ESGs.
- Fund age is significant only in Sample Universe and Sample Master and has a rather low correlation with the fund's ESG.
- Being ethical seems to increase the fund ESG by only about 4.3 points and only in the Sample Universe. Similar to binary (simple regression) results, being ethical or conventional does not seem to have a significant effect in the Sample Master. This finding strengthens the argument that within fund families that hold both ethical and conventional funds, fund managers tend to select similar assets to invest.
- The effect of the fund's investment focus on the fund's ESG is significant and negative in Sample Universe and Sample Master. This result implies that although being ethical increases the fund's ESG on average by 4.3 points, having a geographical focus in the US decreases the average ESG by about 3.2 to 3.5 points. Ethical funds with a global focus seem to have better opportunities to invest in stocks with higher ESG scores.
- Percentage of sin is negatively correlated with fund ESG in Sample ExFocus and Sample InFocus and positively correlated with fund ESG in Sample Universe and Sample Master. This controversy might signal that, not all funds necessarily avoid investing sin assets while they hold high ESG assets.
- Short term performance has a positive correlation with fund ESG in only Sample Universe and it is not statistically significant in the other samples. The positive correlation indicates that high-ESG stocks perform well in the market, a finding that is partially supported in the previous literature.
- The previous year's performance is positively correlated with the fund ESG score in Sample Universe and Sample Master. This result implies that fund

managers can afford to make more high-ESG investments in the current year if they performed well in the previous year.

- Similarity between ethical and conventional in the same family has no significant correlation with fund ESG. On the other hand, section has a significant positive correlation with ESG in both Sample ExFocus and Sample InFocus. This result implies that as the similarity between conventional funds increases, fund ESG increases as well.
- Similarity between ethical members of the family has no significant effect over ESG. Since ethical funds from the same family make similar ESG-based choices, the average ESG scores for the funds seem to be similar to each other as well.

Note that, ability to explain variances in the sample – r squared values - alters with respect to different samples used in studies.

6.2.2. Relative Performance Regressions

The following regression model is estimated with the 1-Year relative performance as the dependent variable:

$$P_{lt}^{rel} = f(AR, AGE, EC, FU, ESG, \eta_{sin}, OL_c, OL_e)$$

The independent variables in this model are defined as before. Estimation results are presented in Table 12. The following are the hypotheses regarding the relationships in this model:

- AR (being active or retired), AGE (fund age), FU (US focus) and OL_e (similarity with other ethical funds) are not expected to be significantly correlated with fund performance since there is no prior evidence in the literature to expect that fund performance changes based on any of these characteristics.
- As mentioned earlier sections, being ethical is expected to decrease the diversification opportunities available to the fund manager. As a result, ethical funds may have poorer performance in comparison with conventional funds.

Therefore, the ethical dummy, EC, is expected to have a negative correlation with fund performance.

- With the same argument as above, ESG is also expected to have a negative correlation with performance since higher fund ESG may imply a decreased ability to diversify from the fund manager's point of view.
- In the literature, sin stocks are shown to outperform the market. As a result, a fund's performance is expected to be higher as the percentage of sin stocks in the portfolio increases. Therefore, a positive correlation is expected between the sin percentage and fund performance.
- If the similarity of an ethical fund with a conventional fund in the same family implies better opportunities for diversification, then a positive correlation is expected between OL_c (similarity with conventional funds) and fund performance.

Table 12
1 Year Relative Performance Regression Results

This table presents results for regression results within different samples with ESG as the dependent variable. The first column presents the independent variables. Column A. presents the expected relationship (null hypothesis) between the variables. Column B. presents results for Sample Universe. Column C. presents results for Sample Master. Column D. presents results for Sample ExFocus. Column E. presents results for the quartile part of Sample ExFocus. Column F. presents results for the excluded quartile part of Sample ExFocus. Column G. presents results for Sample InFocus. Column H. presents results for the quartile part of Sample InFocus. Column I. presents results for the excluded quartile part of Sample InFocus. (---) implies no expected relationship or the independent variable was not used in the regression. (+) implies that a positive correlation is expected. (-) implies that a negative correlation is expected. (N/S) indicates that there is no significant correlation between the variables. (-N-A-) indicates that the variable is not applicable to be used in the model. Numbers are correlation coefficients between ESG and the independent variable.

Independent Variable	Column A. Expected Results for Correlations (Null Hypothesis)	Column B. Regression Results for Sample Universe	Column C. Regression Results for Sample Master	Column D. Regression Results for Sample ExFocus	Column E. Regression Results for Quartile part of Sample ExFocus	Column F. Regression Results for Quartile part of Sample ExFocus with both Similarity Measures
c	(---)	-3.736	-2.276	1.443	0.265	-1.735
AR	(---)	1.3	(N/S)	(N/S)	(N/S)	(N/S)
AGE	(---)	0.022	(N/S)	(N/S)	(---)	(---)
EC	(-)	1.561	1.272	(-N-A-)	(-N-A-)	(-N-A-)
FU	(---)	(N/S)	(N/S)	(N/S)	(N/S)	(N/S)
ESG	(-)	0.046	0.052	(N/S)	(---)	(---)
η_{sin}	(+)	(N/S)	(N/S)	(N/S)	(N/S)	(N/S)
OL_c	(+)	(-N-A-)	(-N-A-)	0.109	0.157	0.171
OL_e	(---)	(-N-A-)	(-N-A-)	(-N-A-)	(-N-A-)	0.155
Regression R-squared		0.021	0.021	0.029	0.068	0.172

The results presented in Table 12 include an additional column at the right end of the table. This column includes both similarity measures simultaneously in the model. The following findings are observed in Table 12:

- Active and relatively older funds seem to have better performance only in Sample Universe. This result may point to relatively poorer performance of retired funds (which may have been retired as a result of poor performance) as well as a better stock picking ability of older funds' managers. However, it should be noted that this is not a robust result in the sense that significance is observed in one of the samples only.
- Results show that performance of ethical funds exceeds the performance of conventional funds by about 1.56%. This is a finding that is partially supported in the previous literature.
- As expected, a US focus for investments has no significant effect on the fund's 1-year relative performance.
- Contrary to expectations but in line with the result of ethical funds exhibiting a higher performance, fund ESG is positively correlated with performance in both Sample Universe and Sample Master. This lends partial support to the literature and implies that high-ESG assets perform well in the market.
- Another result that is in contradiction with expectations is that sin percentage is not significantly correlated with fund performance. Including sin stocks in the portfolio may increase diversification opportunities for the fund manager but these stocks do not seem to contribute positively to fund performance.
- Performance of ethical funds is significantly positively correlated with OL_c in Sample ExFocus. This result could imply that if fund family managers thinks that a particular asset will perform well, then they tend to include this asset in both ethical and conventional funds within the family. This implication is supported by the last column in Table 12 as both similarity measures show a positive correlation with 1-year relative performance.

6.2.3. Percentage of Sin Regressions

The following regression model is estimated with the sin sector allocation as the dependent variable.

$$\eta_{sin} = f(AR, AGE, EC, FU, ESG, P_{st}, P_{lt}^{-1}, SEC, OL_c, OL_e)$$

The independent variables in this model are defined as before. Estimation results are presented in Table 13. The following are the hypotheses regarding the relationships in this model:

- Being ethical is expected to have a negative significant correlation with sin sector allocation, especially if ethical funds use negative screening to avoid sin stocks.
- Similarly, fund ESG is expected to have a negative correlation with sin sector allocation since sin stocks typically have lower ESG scores.
- Short term performance is expected to be significantly positively correlated with sin stock allocation. This expectation is based on the implication that when funds are able to select from sin industries they have improved diversification opportunities and this may result in relatively superior performance.
- The correlation between P_{lt}^{-1}(past year's performance) and η_{sin} (sin percentage) is also expected to be positive. The reasoning behind this expectation is that 1-year earlier performance results may create a window for fund managers to act not too selective in terms of avoiding sin stocks.
- Lastly, OL_c (similarity between ethical and conventional funds in the same family) is expected to have a positive correlation with sin sector allocation. Since conventional funds have no limitation to invest in sin stocks, similarity with conventional funds within the family may imply that the ethical fund includes some sin stocks in its portfolio as well. Please note that being ethical does not necessarily imply that a fund will completely avoid investment in sin sectors. As a matter of fact, according to capital market regulations, ethical funds are allowed to invest up to 20% of their portfolio in sin sectors.

Table 13
Percentage of Sin Regression Results

This table presents results for regression results within different samples with ESG as the dependent variable. The first column presents the independent variables. Column A. presents the expected relationship (null hypothesis) between the variables. Column B. presents results for Sample Universe. Column C. presents results for Sample Master. Column D. presents results for Sample ExFocus. Column E. presents results for the quartile part of Sample ExFocus. Column F. presents results for the excluded quartile part of Sample ExFocus. Column G. presents results for Sample InFocus. Column H. presents results for the quartile part of Sample InFocus. Column I. presents results for the excluded quartile part of Sample InFocus. (---) implies no expected relationship or the independent variable was not used in the regression. (+) implies that a positive correlation is expected. (-) implies that a negative correlation is expected. (N/S) indicates that there is no significant correlation between the variables. (-N-A-) indicates that the variable is not applicable to be used in the model. Numbers are correlation coefficients between ESG and the independent variable.

Independent Variable	Column A. Expected Results for Correlations (Null Hypothesis)	Column B. Regression Results for Sample Universe	Column C. Regression Results for Sample Master	Column D. Regression Results for Sample ExFocus	Column E. Regression Results for Quartile part of Sample ExFocus	Column F. Regression Results for Excluded Quartile part of Sample ExFocus	Column G. Regression Results for Sample InFocus	Column H. Regression Results for Quartile part of Sample InFocus	Column I. Regression Results for Excluded Quartile part of Sample InFocus
c	(---)	1.614	-0.046	2.464	1.217	3.058	2.627	0.393	4.673
AR	(---)	(N/S)	(N/S)	(N/S)	(N/S)	(---)	(N/S)	(N/S)	(---)
AGE	(---)	(N/S)	(N/S)	0.039	0.053	(N/S)	0.041	0.064	(N/S)
EC	(-)	-1.849	-1.815	(-N-A-)	(-N-A-)	(-N-A-)	(-N-A-)	(-N-A-)	(-N-A-)
FU	(---)	-1.154	(N/S)	(N/S)	(N/S)	(N/S)	(N/S)	(N/S)	(N/S)
ESG	(-)	0.041	0.049	-0.032	(N/S)	-0.031	-0.03	(N/S)	-0.055
P_{st}	(+)	(N/S)	(N/S)	(N/S)	(N/S)	(---)	(---)	(---)	(---)
P_{lt}^{-1}	(+/-)	-0.027	-0.067	(N/S)	(N/S)	(N/S)	(N/S)	(---)	(N/S)
SEC	(+)	(-N-A-)	(-N-A-)	0.327	(N/S)	(-N-A-)	(---)	(N/S)	(-N-A-)
OL_c	(+)	(-N-A-)	(-N-A-)	(N/S)	(N/S)	(-N-A-)	0.030	0.029	(-N-A-)
OL_e	(---)	(-N-A-)	(-N-A-)	(-N-A-)	(N/S)	(N/S)	(-N-A-)	(N/S)	(---)
Regression R-squared		0.052	0.054	0.121	0.062	0.068	0.098	0.129	0.151

The following findings are observed in Table 13:

- Being active or retired has no significant effect over η_{sin}.
- Being ethical has a significant negative effect over sin allocation: sin sector percentage decreases by about 2% in ethical funds. Although the negative correlation is expected, the difference between the sin sector of allocation of ethical and conventional funds is not as large as expected. It is clear that, ethical funds are less willing to invest in sin assets, but the difference is not as large as it would be implied by the "ethical" designation.
- Focus on US is significant and negative only for Sample Universe. This finding indicates that US focused funds are investing in sin assets by a smaller percentage compared to funds with other geographical focuses. However, the magnitude of the difference is quite small, nearly 1.2%.
- ESG is negatively correlated with sin percentage only for families that hold both ethical and conventional funds. This is a finding in line with the previous literature. On the other hand, ESG is positively correlated within Sample Universe and Sample Master. This result was not expected, and it might signal that conventional funds may invest in high-ESG assets, seeing them as an opportunity for diversification.
- Long term 1-year previous performance is significant only for Sample Universe and Sample Master. These results are in line with the positive correlation that was observed between past year's performance and current year's fund ESG. It seems that as previous year's performance increases, fund managers may afford to avoid investing in sin assets and select more high-ESG assets instead.
- Section is significant and positive in Sample ExFocus and similarity with conventional funds is significant and positive in Sample InFocus. These results imply that as ethical funds become more similar to conventional funds within their family, they tend to invest more in sin assets.

6.3. Discussion of Results

The evidence provided in the above sections can be summarized as follows:

⇒ *Contrary to some evidence in the literature, being ethical does not have a negative effect over fund performance. Instead, results indicate that ethical funds have superior performance in comparison to conventional funds.*

- Binary results of ethical flag with respect to 1 Year Relative Performance which indicates positive correlation supports this statement.
- Regressions of performance as the dependent variable also show that the ethical flag is positively correlated with relative performance.

⇒ *In line with the previous literature, being ethical positively affects the fund's average ESG score and also implies exclusion of sin assets.*

- Binary result of ethical flag and ESG score show positive correlation within Sample Universe, supporting the main argument.
- Regression results of ESG score states that there is a significant positive correlation between ESG and ethical flag in Sample Universe.
- Binary result of ethical flag with percentage of sin show negatively correlation in both Sample Universe and Sample Master.
- Regressions of sin percentage shows that ethical funds avoid sin stocks by allocating 2% less to sin industries. It should be noted that this difference is in the right direction but not as large as expected since the "ethical" designation for a fund is typically interpreted as the fund completely avoiding any investment in sin industries.

⇒ *Ethical and conventional funds that are being controlled by the same family become similar to one another in terms of ESG scores and relative performance.*

- Binary result of ESG not being significantly different with respect to the ethical flag in Sample Master is a supporting evidence for this statement.
- Binary results of being in an ethical family versus the fund's ESG and relative performance supports this statement since it is not possible to show a significant difference between ethical and conventional funds.

⇒ *Ethical funds' performance is positively correlated with its similarity with other funds within the same family.*

- Binary result show that both similarity measures introduced by this thesis have significant positive correlation with performance outcomes in Sample ExFocus. This relationship's correlation coefficients are 0.110 for conventional similarity and 0.144 for ethical similarity. Additionally, within the quartile section of Sample ExFocus it can be seen that similarity measure with conventional fund's effect increases further to a correlation coefficient of 0.154.
- Regression results on relative performance show that there is a significant correlation between overlap conventional similarity under Sample Focus with a coefficient of 0.109. For the quartile part of the same sample (where zero similarity funds are excluded) this coefficient is still significant and increases to 0.157.
- Additionally, both similarity measures are included in the regression model simultaneously for the quartile part of Sample ExFocus and both similarity measures still have a positive correlation. Correlation coefficients of conventional and ethical measures in this case are 0.171 and 0.155, respectively.

⇒ *Ethical fund's ESG score is positively correlated with the overlap similarity conventional measure.*

- Binary results for both Sample ExFocus and Sample InFocus and their quartile parts clearly show that similarity of the fund with other conventional members in the family is positively correlated with the fund's ESG score. The coefficients are 0.236 for Sample ExFocus, 0.263 for quartile part of Sample ExFocus, 0.181 for Sample InFocus, and 0.170 for quartile part of Sample InFocus.

⇒ *Fund ESG score and sin percentage are correlated.*

- As expected, fund ESG score and sin percentage are negatively correlated in Sample InFocus and Sample ExFocus. Ethical funds seem to avoid sin stocks which have lower ESG scores.
- Contrary to expectations, fund ESG score and sin percentage are positively correlated in Sample Universe and Sample Master. This finding may imply that ethical funds with a higher average ESG score may invest in sin industries as well since sin stocks provide diversification opportunities for ethical funds.

⇒ *Active ethical funds have higher ESG scores compared to retired funds*.

- It seems that when a fund has better performance over the past year, this encourages the fund manager to invest in more high-ESG stocks and makes it easier to avoid sin stocks.

⇒ *Previous year's performance has a positive effect on ESG and negative effect on sin sector allocation.*

- It seems that when a fund has better performance over the past year, this encourages the fund manager to invest in more high-ESG stocks and makes it easier to avoid sin stocks.

⇒ *Inclusion of sin stocks is not creating any additional benefits or drawbacks for the fund's performance.*

- Regression results for relative performance reveal that there is no significant relationship between these variables in any of the samples.

It is believed that these findings of this thesis study would create a better understanding for different characteristics of ethical funds and conventional funds.

It is believed that these findings of this thesis provide a basis for a better understanding of the different characteristics of ethical and conventional funds. Furthermore, findings also imply that conventional and ethical funds may be getting similar to one another within the same family.

CHAPTER 7

CONCLUSION

This thesis presents up-to-date results on ethical and conventional funds and their different attributes such as performance, ESG scores and so forth.

The mostly repeated argument about the socially responsible investment environment was that ethical funds were expected to perform poorly in comparison to conventional funds. According to the findings in this thesis, this broadly mentioned assumption is rejected. On the contrary, socially responsible mutual funds are found to be perform superior than their counterparts, thereby creating additional societal value for investors.

According to results, the fundamental difference between ethical and conventional funds may start to disappear as both funds seem to invest in similar assets. The similarity between funds increases even further if they are controlled by same fund management company. There seems to be a strong trend among fund managers to invest in similar assets in different attributed funds. This results also reminds the suggestion by Moskowitz (1972) which is “more profitable companies could afford to be more responsible”. Indeed, this seems to be the occasion raised again by this thesis after nearly five decades.

The offerings of being socially responsible may started to decrease as ethical and conventional funds become similar to each other.

Lastly, ethical funds seem to still avoid investing in sin assets, although the difference from conventional funds is not as large as the literature suggests.

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A. BIVARIANT CORRELATION TABLE FOR SAMPLE UNIVERSE

This table presents results for bivariant correlation study within Sample Universe. Each independent variable's Pearson Correlation, 2-tailed significance and number of valid occurrences with different variables is also presented in table.

		Variables								
Variables		Active / Retired	Ethical / Conventional	FocusUS	Age	ESG	% of Sin Sector in Available Assets	1 Month Performance to Last Day	Latest Year Minus 1 Performance	Relative Performance for 1 Year to Last Month End
Active / Retired	Pearson Correlation	1	0.071**	-0.100**	0.215**	0.085**	-0.015	0.505**	0.072**	0.068**
	Sig. (2-tailed)		0.000	0.000	0.000	0.000	0.284	0.000	0.000	0.000
	N	5,408	5,408	5,408	5,408	5,408	5,288	3,388	3,058	3,306
Ethical / Conventional	Pearson Correlation	0.071**	1	-0.004	-0.003	0.053**	-0.101**	0.048**	0.024	0.057**
	Sig. (2-tailed)	0.000		0.792	0.831	0.000	0.000	0.005	0.186	0.001
	N	5,408	5,408	5,408	5,408	5,408	5,288	3,388	3,058	3,306
FocusUS	Pearson Correlation	-0.100**	-0.004	1	0.157**	-0.047**	-0.115**	-0.027	0.366**	-0.013
	Sig. (2-tailed)	0.000	0.792		0.000	0.001	0.000	0.114	0.000	0.447
	N	5,408	5,408	5,408	5,408	5,408	5,288	3,388	3,058	3,306
Age	Pearson Correlation	0.215**	-0.003	0.157**	1	0.175**	0.026	0.086**	0.115**	0.055**
	Sig. (2-tailed)	0.000	0.831	0.000		0.000	0.059	0.000	0.000	0.001
	N	5,408	5,408	5,408	5,408	5,408	5,288	3,388	3,058	3,306
ESG	Pearson Correlation	0.085**	0.053**	-0.047**	0.175**	1	0.159**	0.098**	0.217**	0.102**
	Sig. (2-tailed)	0.000	0.000	0.001	0.000		0.000	0.000	0.000	0.000
	N	5,408	5,408	5,408	5,408	5,408	5,288	3,388	3,058	3,306
% of Sin Sector in Available Assets	Pearson Correlation	-0.015	-0.101**	-0.115**	0.026	0.159**	1	-0.015	-0.060**	0.025
	Sig. (2-tailed)	0.284	0.000	0.000	0.059	0.000		0.401	0.001	0.154
	N	5,288	5,288	5,288	5,288	5,288	5,288	3,324	3,008	3,247
1 Month Performance to Last Day	Pearson Correlation	0.505**	0.048**	-0.027	0.086**	0.098**	-0.015	1	-0.091**	0.061**
	Sig. (2-tailed)	0.000	0.005	0.114	0.000	0.000	0.401		0.000	0.000
	N	3,388	3,388	3,388	3,388	3,388	3,324	3,388	3,058	3,296
Latest Year Minus 1 Performance	Pearson Correlation	0.072**	0.024	0.366**	0.115**	0.217**	-0.060**	-0.091**	1	0.649**
	Sig. (2-tailed)	0.000	0.186	0.000	0.000	0.000	0.001	0.000		0.000
	N	3,058	3,058	3,058	3,058	3,058	3,008	3,058	3,058	3,058
Relative Performance for 1 Year to Last Month End	Pearson Correlation	0.068**	0.057**	-0.013	0.055**	0.102**	0.025	0.061**	0.649**	1
	Sig. (2-tailed)	0.000	0.001	0.447	0.001	0.000	0.154	0.000	0.000	
	N	3,306	3,306	3,306	3,306	3,306	3,247	3,296	3,058	3,306

**. Correlation is significant at the 0.01 level (2-tailed).

B. BIVARIANT CORRELATION TABLE FOR SAMPLE MASTER

This table presents results for bivariant correlation study within Sample Master. Each independent variable's Pearson Correlation, 2-tailed significance and number of valid occurrences with different variables is also presented in table.

		Variables								
Variables		Active / Retired	Ethical / Conventional	FocusUS	Age	ESG	% of Sin Sector in Available Assets	1 Month Performance to Last Day	Latest Year Minus 1 Performance	Relative Performance for 1 Year to Last Month End
Active / Retired	Pearson Correlation	1	0.073**	-0.059*	0.154**	0.126**	-0.010	0.544**	0.073*	0.056
	Sig. (2-tailed)		0.004	0.019	0.000	0.000	0.695	0.000	0.020	0.067
	N	1,571	1,571	1,571	1,571	1,571	1,551	1,110	1,009	1,089
Ethical / Conventional	Pearson Correlation	0.073**	1	0.017	-0.053*	0.024	-0.182**	0.074*	0.009	0.080**
	Sig. (2-tailed)	0.004		0.510	0.035	0.343	0.000	0.014	0.781	0.008
	N	1,571	1,571	1,571	1,571	1,571	1,551	1,110	1,009	1,089
FocusUS	Pearson Correlation	-0.059*	0.017	1	0.211**	-0.024	-0.063*	-0.033	0.441**	0.034
	Sig. (2-tailed)	0.019	0.510		0.000	0.335	0.013	0.276	0.000	0.266
	N	1,571	1,571	1,571	1,571	1,571	1,551	1,110	1,009	1,089
Age	Pearson Correlation	0.154**	-0.053*	0.211**	1	0.120**	0.057*	0.030	0.095**	0.027
	Sig. (2-tailed)	0.000	0.035	0.000		0.000	0.025	0.321	0.003	0.370
	N	1,571	1,571	1,571	1,571	1,571	1,551	1,110	1,009	1,089
ESG	Pearson Correlation	0.126**	0.024	-0.024	0.120**	1	0.159**	0.003	0.235**	0.113**
	Sig. (2-tailed)	0.000	0.343	0.335	0.000		0.000	0.911	0.000	0.000
	N	1,571	1,571	1,571	1,571	1,571	1,551	1,110	1,009	1,089
% of Sin Sector in Available Assets	Pearson Correlation	-0.010	-0.182**	-0.063*	0.057*	0.159**	1	-0.002	-0.076*	0.023
	Sig. (2-tailed)	0.695	0.000	0.013	0.025	0.000		0.937	0.016	0.456
	N	1,551	1,551	1,551	1,551	1,551	1,551	1,102	1,002	1,081
1 Month Performance to Last Day	Pearson Correlation	0.544**	0.074*	-0.033	0.030	0.003	-0.002	1	-0.063*	0.080**
	Sig. (2-tailed)	0.000	0.014	0.276	0.321	0.911	0.937		0.046	0.009
	N	1,110	1,110	1,110	1,110	1,110	1,102	1,110	1,008	1,075
Latest Year Minus 1 Performance	Pearson Correlation	0.073*	0.009	0.441**	0.095**	0.235**	-0.076*	-0.063*	1	0.652**
	Sig. (2-tailed)	0.020	0.781	0.000	0.003	0.000	0.016	0.046		0.000
	N	1,009	1,009	1,009	1,009	1,009	1,002	1,008	1,009	1,009
Relative Performance for 1 Year to Last Month End	Pearson Correlation	0.056	0.080**	0.034	0.027	0.113**	0.023	0.080**	0.652**	1
	Sig. (2-tailed)	0.067	0.008	0.266	0.370	0.000	0.456	0.009	0.000	
	N	1,089	1,089	1,089	1,089	1,089	1,081	1,075	1,009	1,089

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

C. BIVARIANT CORRELATION TABLE FOR SAMPLE EXFOCUS

This table presents results for bivariant correlation study within Sample ExFocus. Each independent variable's Pearson Correlation, 2-tailed significance and number of valid occurrences with different variables is also presented in table.

		Variables										
Variables		Active / Retired	FocusUS	Section	Age	ESG	Overlap Likeness Ethical	Overlap Likeness Conventional	% of Sin Sector in Available Assets	1 Month Performance to Last Day	Latest Year Minus 1 Performance	Relative Performance for 1 Year to Last Month End
Active / Retired	Pearson Correlation	1	-0.147*	-0.017	0.127	0.135*	0.076	0.023	0.191**	0.588**	-0.001	0.055
	Sig. (2-tailed)		0.029	0.805	0.061	0.045	0.263	0.736	0.005	0.000	0.987	0.484
	N	220	220	220	220	220	220	220	217	172	157	165
FocusUS	Pearson Correlation	-0.147*	1	0.120	0.214**	-0.122	0.160*	0.151*	0.080	-0.132	0.388**	0.002
	Sig. (2-tailed)	0.029		0.076	0.001	0.071	0.017	0.026	0.242	0.085	0.000	0.981
	N	220	220	220	220	220	220	220	217	172	157	165
Section	Pearson Correlation	-0.017	0.120	1	0.078	0.240**	0.266**	0.764**	0.203**	-0.009	0.225**	0.047
	Sig. (2-tailed)	0.805	0.076		0.248	0.000	0.000	0.000	0.003	0.908	0.005	0.551
	N	220	220	220	220	220	220	220	217	172	157	165
Age	Pearson Correlation	0.127	0.214**	0.078	1	0.027	0.105	-0.002	0.164*	-0.060	0.106	0.041
	Sig. (2-tailed)	0.061	0.001	0.248		0.688	0.122	0.976	0.016	0.431	0.186	0.605
	N	220	220	220	220	220	220	220	217	172	157	165
ESG	Pearson Correlation	0.135*	-0.122	0.240**	0.027	1	-0.016	0.157*	-0.083	0.042	0.108	-0.071
	Sig. (2-tailed)	0.045	0.071	0.000	0.688		0.818	0.019	0.221	0.585	0.176	0.365
	N	220	220	220	220	220	220	220	217	172	157	165
Overlap Likeness Ethical	Pearson Correlation	0.076	0.160*	0.266**	0.105	-0.016	1	0.151*	0.089	-0.028	0.416**	0.247**
	Sig. (2-tailed)	0.263	0.017	0.000	0.122	0.818		0.025	0.190	0.711	0.000	0.001
	N	220	220	220	220	220	220	220	217	172	157	165
Overlap Likeness Conventional	Pearson Correlation	0.023	0.151*	0.764**	-0.002	0.157*	0.151*	1	0.135*	0.047	0.267**	0.173*
	Sig. (2-tailed)	0.736	0.026	0.000	0.976	0.019	0.025		0.047	0.536	0.001	0.026
	N	220	220	220	220	220	220	220	217	172	157	165
% of Sin Sector in Available Assets	Pearson Correlation	0.191**	0.080	0.203**	0.164*	-0.083	0.089	0.135*	1	0.050	-0.037	0.002
	Sig. (2-tailed)	0.005	0.242	0.003	0.016	0.221	0.190	0.047		0.515	0.647	0.979
	N	217	217	217	217	217	217	217	217	170	155	163
1 Month Performance to Last Day	Pearson Correlation	0.588**	-0.132	-0.009	-0.060	0.042	-0.028	0.047	0.050	1	-0.080	0.141
	Sig. (2-tailed)	0.000	0.085	0.908	0.431	0.585	0.711	0.536	0.515		0.318	0.073
	N	172	172	172	172	172	172	172	170	172	157	164
Latest Year Minus 1 Performance	Pearson Correlation	-0.001	0.388**	0.225**	0.106	0.108	0.416**	0.267**	-0.037	-0.080	1	0.634**
	Sig. (2-tailed)	0.987	0.000	0.005	0.186	0.176	0.000	0.001	0.647	0.318		0.000
	N	157	157	157	157	157	157	157	155	157	157	157
Relative Performance for 1 Year to Last Month End	Pearson Correlation	0.055	0.002	0.047	0.041	-0.071	0.247**	0.173*	0.002	0.141	0.634**	1
	Sig. (2-tailed)	0.484	0.981	0.551	0.605	0.365	0.001	0.026	0.979	0.073	0.000	
	N	165	165	165	165	165	165	165	163	164	157	165

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

D. BIVARIANT CORRELATION TABLE FOR QUARTILE SECTION OF SAMPLE EXFOCUS

This table presents results for bivariant correlation study within quartile section of Sample ExFocus. Each independent variable's Pearson Correlation, 2-tailed significance and number of valid occurrences with different variables is also presented in table.

		Variables										
Variables		Active / Retired	FocusUS	Section	Age	ESG	Overlap Likeness Ethical	Overlap Likeness Conventional	% of Sin Sector in Available Assets	1 Month Performance to Last Day	Latest Year Minus 1 Performance	Relative Performance for 1 Year to Last Month End
Active / Retired	Pearson Correlation	1	-0.090	0.039	0.191*	0.069	0.093	0.062	0.208*	0.605**	0.010	0.004
	Sig. (2-tailed)		0.299	0.653	0.027	0.426	0.283	0.473	0.016	0.000	0.924	0.966
	N	135	135	135	135	135	135	135	134	104	97	103
FocusUS	Pearson Correlation	-0.090	1	0.188*	0.288**	-0.094	0.161	0.191*	0.114	-0.178	0.385**	0.088
	Sig. (2-tailed)	0.299		0.029	0.001	0.277	0.062	0.026	0.189	0.071	0.000	0.378
	N	135	135	135	135	135	135	135	134	104	97	103
Section	Pearson Correlation	0.039	0.188*	1	0.154	0.465**	0.175*	0.730**	0.060	0.012	0.313**	0.155
	Sig. (2-tailed)	0.653	0.029		0.074	0.000	0.043	0.000	0.489	0.901	0.002	0.117
	N	135	135	135	135	135	135	135	134	104	97	103
Age	Pearson Correlation	0.191*	0.288**	0.154	1	0.156	0.132	-0.022	0.241**	-0.122	0.074	0.033
	Sig. (2-tailed)	0.027	0.001	0.074		0.071	0.127	0.802	0.005	0.218	0.470	0.744
	N	135	135	135	135	135	135	135	134	104	97	103
ESG	Pearson Correlation	0.069	-0.094	0.465**	0.156	1	-0.072	0.207*	-0.076	0.054	0.038	-0.075
	Sig. (2-tailed)	0.426	0.277	0.000	0.071		0.405	0.016	0.380	0.586	0.714	0.449
	N	135	135	135	135	135	135	135	134	104	97	103
Overlap Likeness Ethical	Pearson Correlation	0.093	0.161	0.175*	0.132	-0.072	1	0.061	0.067	-0.053	0.420**	0.317**
	Sig. (2-tailed)	0.283	0.062	0.043	0.127	0.405		0.484	0.444	0.594	0.000	0.001
	N	135	135	135	135	135	135	135	134	104	97	103
Overlap Likeness Conventional	Pearson Correlation	0.062	0.191*	0.730**	-0.022	0.207*	0.061	1	0.043	0.073	0.292**	0.254**
	Sig. (2-tailed)	0.473	0.026	0.000	0.802	0.016	0.484		0.618	0.462	0.004	0.010
	N	135	135	135	135	135	135	135	134	104	97	103
% of Sin Sector in Available Assets	Pearson Correlation	0.208*	0.114	0.060	0.241**	-0.076	0.067	0.043	1	0.037	-0.067	0.050
	Sig. (2-tailed)	0.016	0.189	0.489	0.005	0.380	0.444	0.618		0.713	0.518	0.618
	N	134	134	134	134	134	134	134	134	103	96	102
1 Month Performance to Last Day	Pearson Correlation	0.605**	-0.178	0.012	-0.122	0.054	-0.053	0.073	0.037	1	-0.064	0.120
	Sig. (2-tailed)	0.000	0.071	0.901	0.218	0.586	0.594	0.462	0.713		0.536	0.232
	N	104	104	104	104	104	104	104	103	104	97	102
Latest Year Minus 1 Performance	Pearson Correlation	0.010	0.385**	0.313**	0.074	0.038	0.420**	0.292**	-0.067	-0.064	1	0.730**
	Sig. (2-tailed)	0.924	0.000	0.002	0.470	0.714	0.000	0.004	0.518	0.536		0.000
	N	97	97	97	97	97	97	97	96	97	97	97
Relative Performance for 1 Year to Last Month End	Pearson Correlation	0.004	0.088	0.155	0.033	-0.075	0.317**	0.254**	0.050	0.120	0.730**	1
	Sig. (2-tailed)	0.966	0.378	0.117	0.744	0.449	0.001	0.010	0.618	0.232	0.000	
	N	103	103	103	103	103	103	103	102	102	97	103

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

E. BIVARIANT CORRELATION TABLE FOR EXCLUDED QUARTILE SECTION OF SAMPLE EXFOCUS

This table presents results for bivariant correlation study within excluded quartile section of Sample ExFocus. Each independent variable's Pearson Correlation, 2-tailed significance and number of valid occurrences with different variables is also presented in table.

		Variables								
Variables		Active / Retired	FocusUS	Age	ESG	Overlap Likeness Ethical	% of Sin Sector in Available Assets	1 Month Performance to Last Day	Latest Year Minus 1 Performance	Relative Performance for 1 Year to Last Month End
Active / Retired	Pearson Correlation	1	-0.236*	0.058	0.240*	0.087	0.215	0.559**	.c	0.191
	Sig. (2-tailed)		0.030	0.599	0.027	0.430	0.051	0.000	0.000	0.137
	N	85	85	85	85	85	83	68	60	62
FocusUS	Pearson Correlation	-0.236*	1	0.136	-0.166	0.183	-0.027	-0.039	0.412**	-0.156
	Sig. (2-tailed)	0.030		0.214	0.130	0.094	0.807	0.750	0.001	0.225
	N	85	85	85	85	85	83	68	60	62
Age	Pearson Correlation	0.058	0.136	1	-0.103	0.080	0.056	0.070	0.182	0.060
	Sig. (2-tailed)	0.599	0.214		0.346	0.469	0.612	0.573	0.164	0.641
	N	85	85	85	85	85	83	68	60	62
ESG	Pearson Correlation	0.240*	-0.166	-0.103	1	0.120	-0.127	0.017	0.296*	-0.065
	Sig. (2-tailed)	0.027	0.130	0.346		0.274	0.253	0.890	0.022	0.615
	N	85	85	85	85	85	83	68	60	62
Overlap Likeness Ethical	Pearson Correlation	0.087	0.183	0.080	0.120	1	-0.080	0.125	0.389**	0.039
	Sig. (2-tailed)	0.430	0.094	0.469	0.274		0.470	0.309	0.002	0.761
	N	85	85	85	85	85	83	68	60	62
% of Sin Sector in Available Assets	Pearson Correlation	0.215	-0.027	0.056	-0.127	-0.080	1	0.124	0.000	-0.106
	Sig. (2-tailed)	0.051	0.807	0.612	0.253	0.470		0.316	0.998	0.415
	N	83	83	83	83	83	83	67	59	61
1 Month Performance to Last Day	Pearson Correlation	0.559**	-0.039	0.070	0.017	0.125	0.124	1	-0.132	0.202
	Sig. (2-tailed)	0.000	0.750	0.573	0.890	0.309	0.316		0.313	0.116
	N	68	68	68	68	68	67	68	60	62
Latest Year Minus 1 Performance	Pearson Correlation	.c	0.412**	0.182	0.296*	0.389**	0.000	-0.132	1	0.366**
	Sig. (2-tailed)	0.000	0.001	0.164	0.022	0.002	0.998	0.313		0.004
	N	60	60	60	60	60	59	60	60	60
Relative Performance for 1 Year to Last Month End	Pearson Correlation	0.191	-0.156	0.060	-0.065	0.039	-0.106	0.202	0.366**	1
	Sig. (2-tailed)	0.137	0.225	0.641	0.615	0.761	0.415	0.116	0.004	
	N	62	62	62	62	62	61	62	60	62

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
c. Cannot be computed because at least one of the variables is constant.

F. BIVARIANT CORRELATION TABLE FOR SAMPLE INFOCUS

This table presents results for bivariant correlation study within Sample InFocus. Each independent variable's Pearson Correlation, 2-tailed significance and number of valid occurrences with different variables is also presented in table.

		Variables										
Variables		Active / Retired	FocusUS	Section	Age	ESG	Overlap Likeness Ethical	Overlap Likeness Conventional	% of Sin Sector in Available Assets	1 Month Performance to Last Day	Latest Year Minus 1 Performance	Relative Performance for 1 Year to Last Month End
Active / Retired	Pearson Correlation	1	-0.147*	0.035	0.127	0.135*	0.018	0.061	0.191**	0.588**	-0.001	0.055
	Sig. (2-tailed)		0.029	0.604	0.061	0.045	0.785	0.371	0.005	0.000	0.987	0.484
	N	220	220	220	220	220	220	220	217	172	157	165
FocusUS	Pearson Correlation	-0.147*	1	0.085	0.214**	-0.122	0.074	0.071	0.080	-0.132	0.388**	0.002
	Sig. (2-tailed)	0.029		0.211	0.001	0.071	0.272	0.291	0.242	0.085	0.000	0.981
	N	220	220	220	220	220	220	220	217	172	157	165
Section	Pearson Correlation	0.035	0.085	1	0.067	0.204**	0.294**	0.868**	0.189**	0.006	0.167*	-0.003
	Sig. (2-tailed)	0.604	0.211		0.321	0.002	0.000	0.000	0.005	0.936	0.037	0.970
	N	220	220	220	220	220	220	220	217	172	157	165
Age	Pearson Correlation	0.127	0.214**	0.067	1	0.027	0.063	-0.005	0.164*	-0.060	0.106	0.041
	Sig. (2-tailed)	0.061	0.001	0.321		0.688	0.353	0.938	0.016	0.431	0.186	0.605
	N	220	220	220	220	220	220	220	217	172	157	165
ESG	Pearson Correlation	0.135*	-0.122	0.204**	0.027	1	-0.002	0.150*	-0.083	0.042	0.108	-0.071
	Sig. (2-tailed)	0.045	0.071	0.002	0.688		0.980	0.026	0.221	0.585	0.176	0.365
	N	220	220	220	220	220	220	220	217	172	157	165
Overlap Likeness Ethical	Pearson Correlation	0.018	0.074	0.294**	0.063	-0.002	1	0.313**	0.061	-0.044	0.217**	0.035
	Sig. (2-tailed)	0.785	0.272	0.000	0.353	0.980		0.000	0.373	0.567	0.006	0.656
	N	220	220	220	220	220	220	220	217	172	157	165
Overlap Likeness Conventional	Pearson Correlation	0.061	0.071	0.868**	-0.005	0.150*	0.313**	1	0.184**	0.043	0.161*	0.053
	Sig. (2-tailed)	0.371	0.291	0.000	0.938	0.026	0.000		0.006	0.572	0.044	0.501
	N	220	220	220	220	220	220	220	217	172	157	165
% of Sin Sector in Available Assets	Pearson Correlation	0.191**	0.080	0.189**	0.164*	-0.083	0.061	0.184**	1	0.050	-0.037	0.002
	Sig. (2-tailed)	0.005	0.242	0.005	0.016	0.221	0.373	0.006		0.515	0.647	0.979
	N	217	217	217	217	217	217	217	217	170	155	163
1 Month Performance to Last Day	Pearson Correlation	0.588**	-0.132	0.006	-0.060	0.042	-0.044	0.043	0.050	1	-0.080	0.141
	Sig. (2-tailed)	0.000	0.085	0.936	0.431	0.585	0.567	0.572	0.515		0.318	0.073
	N	172	172	172	172	172	172	172	170	172	157	164
Latest Year Minus 1 Performance	Pearson Correlation	-0.001	0.388**	0.167*	0.106	0.108	0.217**	0.161*	-0.037	-0.080	1	0.634**
	Sig. (2-tailed)	0.987	0.000	0.037	0.186	0.176	0.006	0.044	0.647	0.318		0.000
	N	157	157	157	157	157	157	157	155	157	157	157
Relative Performance for 1 Year to Last Month End	Pearson Correlation	0.055	0.002	-0.003	0.041	-0.071	0.035	0.053	0.002	0.141	0.634**	1
	Sig. (2-tailed)	0.484	0.981	0.970	0.605	0.365	0.656	0.501	0.979	0.073	0.000	
	N	165	165	165	165	165	165	165	163	164	157	165

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).

G. BIVARIANT CORRELATION TABLE FOR QUARTILE SECTION OF SAMPLE INFOCUS

This table presents results for bivariant correlation study within quartile section of Sample InFocus. Each independent variable's Pearson Correlation, 2-tailed significance and number of valid occurrences with different variables is also presented in table.

		Variables										
Variables		Active / Retired	FocusUS	Section	Age	ESG	Overlap Likeness Ethical	Overlap Likeness Conventional	% of Sin Sector in Available Assets	1 Month Performance to Last Day	Latest Year Minus 1 Performance	Relative Performance for 1 Year to Last Month End
Active / Retired	Pearson Correlation	1	-0.095	0.058	0.154	0.169	0.053	0.091	0.221*	0.657**	0.025	0.009
	Sig. (2-tailed)		0.322	0.547	0.107	0.076	0.584	0.345	0.020	0.000	0.826	0.937
	N	111	111	111	111	111	111	111	111	89	82	88
FocusUS	Pearson Correlation	-0.095	1	0.038	0.299**	-0.015	0.013	0.039	0.081	-0.165	0.422**	0.177
	Sig. (2-tailed)	0.322		0.692	0.001	0.878	0.889	0.682	0.398	0.123	0.000	0.099
	N	111	111	111	111	111	111	111	111	89	82	88
Section	Pearson Correlation	0.058	0.038	1	0.033	0.372**	0.313**	0.849**	0.164	0.023	0.118	0.025
	Sig. (2-tailed)	0.547	0.692		0.729	0.000	0.001	0.000	0.085	0.832	0.289	0.818
	N	111	111	111	111	111	111	111	111	89	82	88
Age	Pearson Correlation	0.154	0.299**	0.033	1	0.142	0.047	-0.089	0.306**	-0.139	0.107	0.068
	Sig. (2-tailed)	0.107	0.001	0.729		0.136	0.622	0.353	0.001	0.193	0.337	0.526
	N	111	111	111	111	111	111	111	111	89	82	88
ESG	Pearson Correlation	0.169	-0.015	0.372**	0.142	1	-0.109	0.188*	0.068	0.012	0.048	-0.099
	Sig. (2-tailed)	0.076	0.878	0.000	0.136		0.255	0.048	0.477	0.908	0.669	0.358
	N	111	111	111	111	111	111	111	111	89	82	88
Overlap Likeness Ethical	Pearson Correlation	0.053	0.013	0.313**	0.047	-0.109	1	0.305**	0.041	-0.114	0.155	0.060
	Sig. (2-tailed)	0.584	0.889	0.001	0.622	0.255		0.001	0.669	0.288	0.163	0.576
	N	111	111	111	111	111	111	111	111	89	82	88
Overlap Likeness Conventional	Pearson Correlation	0.091	0.039	0.849**	-0.089	0.188*	0.305**	1	0.160	0.070	0.123	0.100
	Sig. (2-tailed)	0.345	0.682	0.000	0.353	0.048	0.001		0.093	0.514	0.272	0.352
	N	111	111	111	111	111	111	111	111	89	82	88
% of Sin Sector in Available Assets	Pearson Correlation	0.221*	0.081	0.164	0.306**	0.068	0.041	0.160	1	-0.005	0.004	0.071
	Sig. (2-tailed)	0.020	0.398	0.085	0.001	0.477	0.669	0.093		0.961	0.975	0.508
	N	111	111	111	111	111	111	111	111	89	82	88
1 Month Performance to Last Day	Pearson Correlation	0.657**	-0.165	0.023	-0.139	0.012	-0.114	0.070	-0.005	1	-0.044	0.104
	Sig. (2-tailed)	0.000	0.123	0.832	0.193	0.908	0.288	0.514	0.961		0.695	0.338
	N	89	89	89	89	89	89	89	89	89	82	87
Latest Year Minus 1 Performance	Pearson Correlation	0.025	0.422**	0.118	0.107	0.048	0.155	0.123	0.004	-0.044	1	0.761**
	Sig. (2-tailed)	0.826	0.000	0.289	0.337	0.669	0.163	0.272	0.975	0.695		0.000
	N	82	82	82	82	82	82	82	82	82	82	82
Relative Performance for 1 Year to Last Month End	Pearson Correlation	0.009	0.177	0.025	0.068	-0.099	0.060	0.100	0.071	0.104	0.761**	1
	Sig. (2-tailed)	0.937	0.099	0.818	0.526	0.358	0.576	0.352	0.508	0.338	0.000	
	N	88	88	88	88	88	88	88	88	87	82	88

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

H. BIVARIANT CORRELATION TABLE FOR EXCLUDED QUARTILE SECTION OF SAMPLE INFOCUS

This table presents results for bivariant correlation study within excluded quartile section of Sample InFocus. Each independent variable's Pearson Correlation, 2-tailed significance and number of valid occurrences with different variables is also presented in table.

		Variables								
Variables		Active / Retired	FocusUS	Age	ESG	Overlap Likeness Ethical	% of Sin Sector in Available Assets	1 Month Performance to Last Day	Latest Year Minus 1 Performance	Relative Performance for 1 Year to Last Month End
Active / Retired	Pearson Correlation	1	-0.200*	0.105	0.110	-0.041	0.156	0.460**	.c	0.153
	Sig. (2-tailed)		0.037	0.278	0.254	0.672	0.110	0.000	0.000	0.185
	N	109	109	109	109	109	106	83	75	77
FocusUS	Pearson Correlation	-0.200*	1	0.143	-0.217*	0.136	0.052	-0.093	0.331**	-0.200
	Sig. (2-tailed)	0.037		0.139	0.024	0.158	0.597	0.403	0.004	0.081
	N	109	109	109	109	109	106	83	75	77
Age	Pearson Correlation	0.105	0.143	1	-0.053	0.064	0.014	0.053	0.085	0.007
	Sig. (2-tailed)	0.278	0.139		0.582	0.507	0.884	0.637	0.471	0.950
	N	109	109	109	109	109	106	83	75	77
ESG	Pearson Correlation	0.110	-0.217*	-0.053	1	0.084	-0.276**	0.079	0.163	-0.045
	Sig. (2-tailed)	0.254	0.024	0.582		0.388	0.004	0.480	0.163	0.698
	N	109	109	109	109	109	106	83	75	77
Overlap Likeness Ethical	Pearson Correlation	-0.041	0.136	0.064	0.084	1	0.025	0.161	0.313**	-0.008
	Sig. (2-tailed)	0.672	0.158	0.507	0.388		0.799	0.146	0.006	0.945
	N	109	109	109	109	109	106	83	75	77
% of Sin Sector in Available Assets	Pearson Correlation	0.156	0.052	0.014	-0.276**	0.025	1	0.152	-0.165	-0.095
	Sig. (2-tailed)	0.110	0.597	0.884	0.004	0.799		0.174	0.164	0.417
	N	106	106	106	106	106	106	81	73	75
1 Month Performance to Last Day	Pearson Correlation	0.460**	-0.093	0.053	0.079	0.161	0.152	1	-0.150	0.203
	Sig. (2-tailed)	0.000	0.403	0.637	0.480	0.146	0.174		0.200	0.076
	N	83	83	83	83	83	81	83	75	77
Latest Year Minus 1 Performance	Pearson Correlation	.c	0.331**	0.085	0.163	0.313**	-0.165	-0.150	1	0.449**
	Sig. (2-tailed)	0.000	0.004	0.471	0.163	0.006	0.164	0.200		0.000
	N	75	75	75	75	75	73	75	75	75
Relative Performance for 1 Year to Last Month End	Pearson Correlation	0.153	-0.200	0.007	-0.045	-0.008	-0.095	0.203	0.449**	1
	Sig. (2-tailed)	0.185	0.081	0.950	0.698	0.945	0.417	0.076	0.000	
	N	77	77	77	77	77	75	77	75	77

*. Correlation is significant at the 0.05 level (2-tailed).
**. Correlation is significant at the 0.01 level (2-tailed).
c. Cannot be computed because at least one of the variables is constant.

I. TURKISH SUMMARY / TÜRKÇE ÖZET

Sosyal fayda yatırım piyasası incelendiğinde, dikkate değer bir artışın dünya genelinde var olduğu görüşmüştür. (GSIA 2019) tarafından yapılan araştırmalarda, küresel sosyal yatırım piyasası 2014 itibari ile 18 trilyon Amerikan Doları iken, 2018 yılı itibari ile 30 trilyon Amerikan Doları değerine kadar ulaşmıştır. Detaylıca incelendiğinde, birçok yatırım yapılan varlığın Amerikan ve Avrupa varlıkları olduğu görülmektedir. Buna ek olarak, Japonya Avusturalya gibi diğer ülkelerin de bu piyasada oyuncu oldukları bu süre içerisinde gözlenmektedir. Analize göre şaşırtıcı olan, Avrupa sosyal yatırım piyasasının 2014 yılında 10,8 trilyon Amerikan Doları'ndan 2016 yılında %12 büyüyerek 12,0 trilyon Amerikan Doları'na çıkması ve 2018 yılında %3 büyüyerek 12,4 trilyon Amerikan Doları mertebesine yavaşça yükselmesi şaşırtıcıdır. Bahsi geçen 12,4 trilyon Amerikan Doları Avrupa'da yönetilen varlıkların yaklaşık %50'sine tekabül etmektedir. Yine aynı analize göre, Amerikan sosyal yatırım piyasası 2014 yılından 2016 yılına kadar %33, 2016 yılından 2018 yılına kadar %38 büyümüş ve 12,0 trilyon Amerikan Doları mertebesine yükselmiştir. Bu meblağ, Amerika'da yönetilen varlıkların yaklaşık %26'sına tekabül etmektedir. Buradaki büyüme fırsatı göz önünde bulundurularak tezin odak noktası Amerikan Piyasası olarak belirlenmiştir.

Odak noktasını belirledikten sonra birçok farklı varlık incelenmiştir. Hisse senedi varlıkları içerisinde ESG (çevresel, sosyal, idare) puanlarına göre yatırım yapan, geleneksel ve günah hisse senetleri (sigara alkol kumar gibi sektörleri içeren) gibi varlıklar dikkat çekmektedir. Bono piyasasında ise, yeşil bonolar, geleneksel bonolar ve günah bonoları göze batmaktadır. Yatırım fonları incelendiğinde ise, tipik olarak geleneksel ve sosyal fonlar göze çarpmaktadır. Yaptığımız inceleme süresince birçok farklı fon ailesi gözden geçirilmiş ve bu ailelerin sahip olduğu sosyal ve geleneksel fonlar arasında, yatırım yaptıkları varlıklar neslinde birçok benzerlik tespit edilmiştir. Bahsi geçen benzerlik oldukça dikkat çekici olmuş ve tezin odak noktasını oluşturmuştur. Böylelikle tezin araştırma sorusu doğmuştur. Bu soru, 'Sosyal ve geleneksel fonlar gerçekten de birbirlerinden farklı mıdır?' olarak belirmiştir.

Bu soru ile literatür araştırmasına başlanmıştır. Araştırmalar sonucunda güncel literatürün 5 farklı ana başlık altında değerlendirilebileceği görülmüştür.

Bunlardan ilki, sosyal fonların kullandığı eleme yönteminin yatırımcılara bir fayda sağlayıp sağlayamadığıdır. Bu alandaki araştırmalar birbirlerinden farklı sonuçları göstermektedir. (Barnett & Salomon, 2006) ve (Capelle- Blancard & Monjon, 2014) tarafından tamamlanan araştırmalar, eleme yönteminin fonların riskten arındırılmış getirileri üzerinde negatif etkisi olduğunu göstermiştir. (John B. Guerard, 1997) ve (Schröder, 2007) tarafından yapılmış olan araştırmalar ise, eleme yöntemi ve fon getirisi arasında kayda değer bir ilişki olmadığını göstermektedir. (Derwall, Guenster, Bauer, & Koedijk, 2005) ve (Edmans, 2011) tarafından yürütülmüş araştırmalar ise, eleme yönteminin fon getirisi arasında kayda değer bir etkisinin olmadığını fakat bazı spesifik seçimlerin, örneğin firmanın verimliliğini arttıracak elemelerin pozitif yönde etkisinin olabileceğinden bahsedilmektedir.

İkinci grup ise, sosyal yatırımcıların portföy çeşitlendirmesinden mahrum kalması olarak belirtilebilir. Bu alanda bir görüş birliği bulunmaktadır. (Derwall, Guenster, Bauer, & Koedijk, 2005), (Hong & Kacperczyk, 2009) ve (Radu & Funaru, 2011) yaptıkları araştırmalarda, sosyal yatırımın tercih edilmesinin portföy çeşitliliğini sınırladığını söylemişlerdir. Bunlara farklı bir bakış açısı katarak (Riedl & Smeets, 2017) ise, geleneksel yatırımcıların sosyal yatırım fonlarını portföylerini çeşitlendirmek üzere seçebileceğinden bahsetmiştir.

Üçüncü olarak ise, sosyal fayda varlıkları tercih etmenin yatırımcılar üzerinde ek bir değer yaratması olarak değerlendirilebilir. Literatürün bu kısmında da bir görüş birliği bulunmaktadır. (John B. Guerard, 1997), (Edmans, 2011) ve (Chowdhry, Davies, & Waters, 2018) tarafından yürütülmüş çalışmalar yatırımcıların tercihlerinden dolayı huzur duyduklarını söylemektedir. Ayrıca bu yatırımları, dolaylı olarak şirketin verimliliğini arttırdığı, şirketleri daha iyi bir yönetim anlayışına ittiği gibi sonuçları bulunduğunu göstermişlerdir. Bu dolaylı faydalar, geleneksel yatırımcıların da işine gelecek gelişmeler olarak değerlendirilebilir. Literatüre katkı olarak (Chris Addy, Chorengal, Collins, & Etzel, 2019) ve (Viviania & Maurel, 2019) yaptıkları çalışmalarda, sosyal varlıklara yatırım yapmanın, yatırımcılara olan pozitif etkisinin parasal karşılığını hesaplamaya çalışmaktadırlar.

Dördüncü ve en çok incelenen alan olan ise finansal getiri üzerindeki etkilerinin incelenmesidir. (Hamilton, Jo, & Statman, 1993), (John B. Guerard, 1997), (Bauer, Koedijk, & Otten, 2005), (Schröder, 2007) ve (Utz & Wimmer, 2014) tarafından farklı zaman dilimlerinde yapılan araştırmalar sosyal ve geleneksel yatırım fonlarının getiri bazında birbirlerinden kayda değer bir şekilde farklı olmadıklarını göstermişlerdir. Fakat, (Moskowitz, 1972), (Derwall, Guenster, Bauer, & Koedijk, 2005) ve (Edmans, 2011) tarafından tamamlanmış çalışmalar bunlardan farklı olarak sosyal yatırımların geleneksel yatırımlardan fon getirisi bazında daha iyi olduklarını göstermişlerdir. Bunlardan farklı olarak ise, (Brammer, Brooks, & Pavelin, 2006), (Renneboog, Horst, & Zhang , 2008) ve (Hong & Kacperczyk, 2009) tarafından yürütülmüş araştırmalar ise geleneksel fonların getiri bazında sosyal fonlardan daha iyi pozisyonda olduklarını söylemektedirler. Kısaca literatürün bu kısmında bir görüş birliği bulunmamaktadır.

Beşinci ve son olarak literatürde ESG stratejilerinin değerlendirilmesi bulunmaktadır. (Manescu, 2011) yaptığı çalışmada sadece toplum ilişkileri ESG puanının varlık getiri ileri ile kayda değer pozitif bir korelasyon içerisinde olduğunu göstermiştir. (Laermann, 2016) ve (Mooij, 2017) ise, yaptıkları çalışmada ESG puanının kendisini sorgulamışlar ve ESG puanının şirketler tarafından kolayca manipüle edilebileceğini tartışmışlardır.

Tezin araştırma sorusunu cevaplayabilmek için, Thomson Reuters'in sahip olduğu veri tabanı kullanılmıştır. Buradan alınan bilgiler ise 30 Temmuz 2019 tarihinde güncel olarak toplanmıştır. İlgili tarihte veri tabanında bulunan Amerika Birleşik Devletleri ikametgâhlı hisse senedi yatırımı yapan fon sayısı toplamda 29.270 adettir. Bütün bu fonlar için bazı bilgiler veri tabanından çekilmiştir. Örneğin, global fon kimlik numarası, fon ailesi, fon getiri bilgileri, halka arz tarihi gibi bilgiler. Daha sonrasında ise, bu aşamada toplanmış olan iki farklı fon kimlik numarası kullanılarak, fonların ellerinde tuttukları varlıkları toplamak üzere bir bilgisayar kodu yazılmıştır. Bu kod iki farklı kimlik numarasından gelen dataları analiz etmekte ve iki veriyi birleştirmekte kullanılmıştır. Bu aşamada yaklaşık 4 milyon veri elde edilmiş ve bu sayede toplam 21.372 fonun bilgisi elde edilmiştir. Daha sonra veriyi işlemek üzere MATLAB kullanılmış ve her fon diğerleri ile tuttukları varlıklar cinsinden

karşılaştırılmıştır. Benzer fonları listeden attıktan sonra toplamda 6.003 benzersiz fon analizlerde kullanılmak üzere belirlenmiştir. Ek olarak bu aşamada her fon için ESG puanı ve varlık yüzde bilgisi tanımlanmıştır.

Analiz sırasında çeşitliliği sağlanmış fonlar kullanılması amacıyla, portföyünde 11'den az varlık bulunduran toplam 453 fon listeden atılmıştır. Analizin sağlıklı devamını sağlamak için ise varlık yüzde bilgisi %70 ile %105 arasında tutulmuştur, dolayısı ile 141 fon bu aşamada listeden atılmıştır. Geriye kalan grup arasında ESG puanı negatif olan tek fon da listeden atılarak liste temizlenmiştir. Bu aşamalar sonrasında toplamda 5.408 adet benzersiz fon elde kalmıştır.

Analizlerimizde fonların tuttukları varlıkların günah varlıkları olup olmadığını almayabilmek için ise toplamda 21.071 adet varlığın sektör bilgisi Thompson Reuters veri tabanından toplanmıştır. TRBC, GICS ve NAICS sınıflandırma standartlarına göre elde edilmiş veri, ilgili varlıkların sektörlerinin günah sektörleri arasında olup olmadığını tanımlamak için konsolide edilmiştir. Akabinde ise fonlar için varlık sektör yüzde bilgisi ve günah sektör yüzde bilgisi değişkenleri hesaplanmıştır.

Bunlara ek olarak ise, eğer fon canlı ise yaşı 30 Temmuz 2019 tarihine kadar, eğer likide edilmiş veya birleşmiş ise ilgili tarihi referans alarak ömrü hesaplanmıştır. Daha sonrasında ise TR tarafından tanımlanmış etik ve yeşil fon tanımlanmaları birleştirilmiş ve etik olarak kullanılmaya devam edilmiştir.

Elde edilen bu veriler ışığında farklı test numuneleri tanımlanmıştır. Bu numunelerden en kapsamlısı, toplam 5.408 fonu içeren Sample Universe olarak tanımlanmıştır. Toplam fonlar içerisindeki sosyal yatırım fonu sayısı 220 adettir ve toplamda 88 yatırım ailesi tarafından sahiplenilmişlerdir. Bu ailelerden 31 adeti portföyünde sosyal fon tutmaktadır. Geriye kalan 55 adet aile ayrıca toplam 1.351 adet geleneksel fon da portföyünde bulundurmaktadırlar. Belirtilen 1.351 adet geleneksel fon ve kalan 220 adet sosyal fonun birlikte bulunduğu bir numune daha Sample Master olarak tanımlanmıştır.

Bu tezin literatüre en büyük katkısı ise, sosyal fonlar için hesapladığı aile içi portföy örtüşme benzerlik puanıdır. İlgili puanın nasıl hesaplandığı figür 1'de detaylandırılmıştır. İlgili hesaplama yöntemi elde edilen veriler kullanılarak Sample ExFocus numunesi tanımlanmıştır. Bu numuneye ek olarak, fonların coğrafi yatırım

tercihlerini de gözeterek hesaplama yöntemi figür 2'de tanımlanmıştır. Benzer şekilde elde edilen bu numune ise Sample InFocus olarak adlandırılmıştır. Bahsi geçen son 2 numune, ek olarak benzerliği 0 olanlar ve benzerliği 0'dan büyük olanlar olarak alt kısımlara gruplandırılmış ve analizlerde kullanılmışlardır.

Tezin araştırma sorusunu cevaplayabilmek için ise birçok farklı analiz yapılmıştır. Bunlardan ilki her bir numune ve ilgili alt grupları için yapılmış olan tanımlayıcı istatistik analizidir. Bu analizler tablo 5, 6, 7 ve 8'de detaylıca incelenebilir. Bunlardan bir diğeri ikili değişken analizleridir. Bu kısımda bağımlı değişken olarak ESG puanı, 1 yıllık nisbi getirisi ve günah sektör yüzde oranı olarak tanımlanmıştır. Bağımsız değişkenler ise sosyal geleneksel ikili değişkeni, sosyal aile içerisinde bulunma ikili değişkeni ve benzerlik skorları olarak tanımlanmıştır. Bu analizlerde ise SPSS bilgisayar programı kullanılmıştır. Bu kısımda ve ileride istatistik verilerini değerlendirmek için anlamlılık düzeyi olarak 0.05 belirlenmiştir. İkili değişken analizlerinde toplam 27 adet analiz yapılmıştır. Bunlara ek olarak, analizlerin bel kemiğini oluşturan regresyon analizleri bahsi geçmiş olan bağımlı değişkenler için dört farklı numunelerde ve ilgili alt gruplarında tamamlanmıştır.

Destekleyici analizler olarak ise, yatırım fon ailelerinin birbirlerine varlık portföyü bakımından benzerliğini yüzde cinsinden gösteren ısı haritası her sosyal yatırım yapmış aile için hazırlanmıştır. Figür 3'de beklenilen aile benzerliği ısı haritası görülebilir. Burada gösterilen aile dört sosyal ve iki adet geleneksel fonu portföyünde bulundurmaktadır. Tablonun sol ve alt tarafında belirtilen numaralar her bir benzersiz fonu simgelemektedir. Isı haritasında görülebileceği üzere, ilk dört fon daha çok kendi arasında benzemekte, son 2 fon ise daha çok kendi arasında benzerlik göstermektedir. İlgili figür yatırım karakterleri farklı olan ve buna uygun olarak yatırımlarını ayrıştırdıklarını gösteren bir aile örneğidir. Figür 4'de ise, beklenmedik sonuç görülebilir. Burada sosyal ve etik fonların birbirlerinden çok da ayrılmadığı ve birbirlerine oldukça benzedikleri gözlenmiştir. Figür 5'de ise analizler boyunca en çok karşılaştığımız bir aile tipi görülecektir. Bu tip ailelerde, sosyal fonlar ve geleneksel fonlar kendi alt kategorilerinde birbirlerine daha çok benzemekte. Fakat karşılıklı benzemeleri ise hatırı sayılır bir seviyede olduğu gözlenmektedir.

Analiz sonuçlarının sunumu yapılan tablolarda, ilgili sonuçlar gösterilmeden önce sıfır hipotezleri gösterilmektedir. Tablo 7'de sosyal fon veya geleneksel fon olmanın bağımlı değişkenler üzerindeki etkisini ölçmek üzere yapışmış analizler verilmektedir. Sıfır hipotez olarak sosyal fonların geleneksel fonlardan ESG puanı yönünden pozitif olarak ayrışması beklenmektedir. 1 yıllık nisbi getiri ve günah sektör yüzde oranı cinsinden ise negatif olarak ayrışması beklenmektedir. Tablo 8'de bir geleneksel fonun sosyal fayda fonunda da yatırım yapmış bir ailede olup olmamasının bağımlı değişkenler üzerindeki etkisi analizinin sonuçları verilmektedir. Bu analizler de sosyal fayda fonları ile aynı doğrultuda sıfır hipotezlerine sahiplerdir. Bir geleneksel fonun sosyal fona yatırım yapmış bir aile içerisinde olduğu görülmüş ise sosyal karakterinin baskın olabileceği öngörülmüştür. Tablo 9'da ise sosyal fonların ailelerindeki geleneksel fonlar ile portföy örtüşme benzerlik oranının bağımlı değişkenler üzerinde etkisindeki araştırma sonuçları paylaşılmıştır. Burada sıfır hipotez ise benzerlik oranının arttığı müddetçe sosyal karakterlerin zıttı yönünde bağımlı değişlerin etkileneceği öngörülmüştür. Tablo 10'da ise sosyal fonların ailedeki diğer sosyal fonlar ile portföy örtüşme benzerlik oranının bağımlı değişkenler üzerindeki araştırma sonuçları paylaşılmaktadır. Sıfır hipotez olarak ise, ilgili benzerliğin artması neticesinde sosyal karakterin güçleneceği ve bu yönde bağımlı değişkenlerin etkileneceği varsayılmaktadır. Lütfen unutmayalım ki, bu tablolarda verilmiş olan ikili değişken analiz sonuçları bir sonuca varmak için değil, fikir vermesi çalışma prensibini öğrenmek için kullanılmalıdır.

Regresyon analizi sonuçları ise, tablo 11'de bağımlı değilken olarak ESG puanının seçilmiş olduğu analiz sonuçlarını sunmaktadır. Tablo 12'de bağımlı değişken olarak 1 yıllık nisbi getiri ve tablo 13'de ise bağımlı değişken olarak günah sektör yüzde oranı baz alınarak yapılmış analiz sonuçları sunulmaktadır.

Tezin tartışma kısmında birçok farklı realite farklı farklı analiz bulguları ile desteklenmektedir. Bunlardan ilki, analizin yapılmış olduğu tarihlerde, sosyal fonların beklenilenin aksine geleneksel fonlardan 1 yıllık nisbi getiri cinsinden anlamlı olarak olumlu ayrışmasıdır. Bu bulgu ikili değişken analizlerinde ve regresyon analizlerinde sosyal fonların beklenilenin aksi yönünde Sample Universe ve Sample Master numunelerinde anlamlı şekilde ayrışması bulguları ile desteklenmektedir.

İkinci bulgu olarak, sosyal fonların ESG puanı cinsinden geleneksel fonlardan pozitif anlamlı şekilde ayrışması gösterilebilir. Bu bulgu, sosyal fonların ikili değişken ve regresyon analizlerinde Sample Universe numunesi üzerinde yapılmış çalışmalarda anlamlı şekilde geleneksel fonlardan pozitif yönde ayrışması ile desteklenmetektedir. Ayrıca bu bulgu yine, sosyal fonların günah sektör yüzde bağımlı değişkeni üzerinde yapılmış ikili değişken ve regresyon analizlerinde geleneksel fonlardan Sample Universe ve Sample Master numunelerinde negatif olarak ayrışması ile desteklenmektedir. Günah varlıklarının ESG puanı cinsinden diğer varlıklardan negatif olarak ayrıştığı literatürde araştırılmış bir konudur.

Üçüncü bulgu olarak ise, aynı ailede bulunan fonların birbirlerine git gide benzediği çıkarımıdır. Bu bulgu sosyal fonların geleneksel fonlardan ikili değişken analizlerinde Sample Master numunesinde anlamlı şekilde ayrışamaması ile desteklenmektedir. Ayrıca, geleneksel fonlardan, sosyal fayda fonu da portföyünde bulundurmakta olan ailelere mensup olanlar ikili değişken analizinde 1 yıllık nisbi getiri cinsinden pozitif olarak ayrışmaktadırlar. Sosyal fonların da ilgili analiz döneminde ayrıştığı öngörüldüğünde, ilgili bulguyu desteklediği görülmektedir.

Dördüncü bulgu olarak, sosyal fonların aile içindeki fonlara benzerliğinin artması ile 1 yıllık nisbi getirilerinin pozitif yönde ayrışmasıdır. Bu bulgu sosyal ve geleneksel olarak hesaplanmış iki benzerlik oranının da artışı ile arttığı ikili değişken analizlerinde ve regresyon analizlerinde görülmüştür. Yani, fonların aile içi benzerliği arttığı sürece, performanslarının arttığı görülmüştür.

Beşinci bulgu olarak, ESG puan ile günah sektör yüzde oranı arasındaki beklenilen negatif korelasyonun olmamasıdır. Bu bulgu birbirinden numuneler bazında ayrışan regresyon analizleri ile desteklenmektedir. Günah sektör yüzde oranı bağımlı değişken olarak alındığında, ESG puanı ile Sample ExFocus ve Sample InFocus numunelerinde negatif olarak ayrıştığı görülmekte, fakat Sample Universe ve Sample Master numunelerinde ise pozitif olarak ayrıştığı görülmektedir.

Altıncı bulgu olarak, 30 Temmuz 2019 tarihi itibari ile hayatta olan sosyal fonların likide edilmiş veya birleşmiş diğer fonlardan ESG puanı cinsinden pozitif ayrışması gösterilebilir. İlgili bulgu, ESG puanının bağımlı değişken olarak

tanımlandığı regresyon analizinde Sample ExFocus ve Sample InFocus numunelerinde gözlenmektedir.

Yedinci bulgu olarak, bir önceki yıldaki fonun elde etmiş olduğu getirinin ESG puanı üzerinde pozitif yönde etkisi olduğun görülmesidir. İlgili bulgu, ESG puanının bağımlı değişken olarak tanımlandığı regresyon analizinde Sample Universe ve Sample Master numunelerinde bir önceki yıldaki getirinin pozitif olarak ayrışması ile açıklanmaktadır.

Sekizinci bulgu olarak, bir önceki yıldaki fonun elde etmiş olduğu getirinin günah sektör yüzde oranına negatif yönde etkisinin olmasıdır. Bu bulgu, günah sektör yüzde oranının bağımlı değişken olarak tanımlandığı regresyon analizi sonuçları ile desteklenmektedir. Yedinci ve sekizinci bulgular göz önünde bulundurulduğunda, fon yöneticilerinin geçmiş yıldaki performansları sonuçlarına göre daha çok sosyal yatırım yönünde yönlendiklerini de sinyal etmektedir.

Dokuzuncu ve son bulgu ise, günah sektörleri yatırım tercihi olarak görmenin, 1 yıllık nisbi getiri üzerinde negatif veya pozitif bir etkisi olmamasıdır. 1 yıllık nisbi getirinin bağımlı değişken olarak görüldüğü regresyon analizi sonuçlarında günah sektör yüzde oranının anlamlı sonuçlarının olmaması ile desteklenmiştir.

Toparlamak gerekir ise, yapılmış araştırmanın sonucu olarak, yapılan analiz döneminde sosyal fonların geleneksel fonlardan beklenilenin aksine 1 yıllık nisbi getiri cinsinden pozitif olarak ayrıştığı görülmüştür. Ayrıca sosyal yatırım yapmanın, yatırımcıların neslinde sosyal olarak bir katma değer yarattığı görülmektedir. Bu katma değer kimi zaman şirketlerin de birçok alanda verimliliklerini arttırmalarına sebep olmaktadır. Tezin son ve en önemli sonucu ise, sosyal fonlar ve geleneksel fonlar arasındaki farklılıkların gün geçtikçe yok olmasıdır. Özellikle yatırım aileleri içerisinde bu farklılıklar artık gözle görülemeyecek dereceye gelmektedirler.

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