



Signalling commitment to sustainability on the mutual fund market

An investigation of the Swedish equity mutual fund market

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The authors declare that they are the sole authors of this thesis and that they have not used any sources other than those listed in the bibliography and identified as references. They further declare that they have not submitted this thesis at any other institution to obtain a degree.

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- *Sincerely Erik & Mattias*
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ABSTRACT

In the midst of climate change and growing concern about social aspects, investors want to make informed sustainable choices regarding their consumption and investments. Many companies are trying to stay ahead of the curve by engaging in Corporate Social Responsibility. Mutual funds have noticed this trend and subsequently have started to offer ethical mutual funds as a result. These ethical claims are difficult to scrutinize for investors creating a problem of asymmetric information.

This study analyses how ethical claims and how eco-labels, in this case, the Nordic Swan Ecolabel relate to demand for equity mutual funds. In a world where more investors are seeking ethical investments, how is ethical commitment communicated in a trustworthy way?

Data on daily Net Asset Value (NAV) and monthly Total Net Assets (TNA) between 2016-01-01 and 2019-12-31, for 217 equity mutual funds sold on the Swedish market were collected from Thomson & Reuters database Eikon. These mutual funds were categorized into three groups, conventional, non-labelled ethical, and eco-labelled mutual funds. The data was structured as panel data and both random effect and fixed effect models were used to estimate the factor loadings.

The study shows that Nordic Swan Ecolabelled mutual funds tend to experience higher demand than both non-labelled ethical mutual funds and conventional mutual funds. In other words, the Nordic Swan Ecolabelled group distinguishes itself from the other mutual fund groups. Hence, the results of the study suggest that the Nordic Swan Ecolabel sends a signal that relates positively to the demand for mutual funds. Further, the results implicate that mutual fund companies that aim to introduce mutual funds that are truly ethical or sustainable should consider acquiring the Nordic Swan Ecolabel to signal their sustainability commitment since the results suggest that Nordic Swan Ecolabelled mutual funds have a positive relation to demand, both compared to conventional mutual funds and non-labelled ethical mutual funds.

Keywords: Nordic Swan Ecolabel, Equity mutual funds, Signalling, eco-labelling, sustainable investing

SAMMANFATTNING

I en tid präglad av klimatförändring och ökande medvetenhet om sociala aspekter vill investerare ta informerade beslut angående sin konsumtion och angående sina investeringar. Många företag försöker ligga i framkant för en hållbar utveckling genom att ägna sig åt Corporate Social Responsibility. Fondföretag har märkt av denna trend och har därför börjat erbjuda etiska fonder till sina kunder. Huruvida dessa fonder faktiskt är etiska kan vara svårt för investerare att undersöka vilket skapar asymmetrisk information mellan fondföretag och investerare.

Denna studie analyserar hur aktiefonders påståenden om att investera etiskt relaterar till efterfrågan på dessa aktiefonder och hur eko-märkningar, i detta fall Svanen-märkningen relaterar till aktiefonders efterfrågan. Hur ska fonders etiska åtaganden kommuniceras på ett trovärdigt sätt i en värld där mer och mer investerare söker sig till etiska investeringar?

Dagligt nettoandelsvärde (NAV-kurs) och månatlig fondförmögenhet (TNA) för 217 aktiefonder sålda på den svenska marknaden under tidsperioden 2016-01-01 och 2019-12-31 samlades in från Thomson & Reuters databas Eikon. Dessa fonder delades in i tre grupper, dessa var konventionella, icke-märkta etiska fonder samt eko-märkta fonder. Datan strukturerades som paneldata och både random effects och fixed effects modeller användes för att estimerar faktorerna i regressionen.

Studien visar att Svanenmärkta fonder tenderar att ha högre efterfrågan än både icke-märkta etiska fonder och konventionella fonder. Med andra ord så utmärker sig de Svanen-märkta fonderna jämfört med de andra grupperna. Resultatet av studien tyder därför på att Svanen-märkningen sänder en signal som relaterar till efterfrågan för en fond. Resultatet av studien implicerar även att fondföretag som ämnar att introducera fonder som faktiskt uppfyller de etiska och hållbara krav de påstår sig göra, bör överväga att förvärva Svanen-märkningen för att signalera sina etiska och hållbara åtaganden, då resultatet föreslår att Svanenmärkta fonder har en positiv relation till efterfrågan, både jämfört med konventionella fonder och icke-märkta etiska fonder.

Nyckelord: Svanenmärkning, Aktiefonder, Signalteori, Eko-märkning, Hållbart investera

NOMENCLATURE

Total net assets (TNA)	The total amount of wealth within a mutual fund.
Net asset value (NAV)	The total amount of wealth within a mutual fund divided by the number of outstanding shares.
Corporate social responsibility (CSR)	Term used to describe companies' efforts to incorporate sustainability into their venture.
Socially responsible investment (SRI)	Term used in finance to describe how financial assets incorporate sustainability into their investment strategies.
Environmental social governance (ESG) - analysis	Commonly used index to rate different financial assets sustainability efforts.
Eco-label	In this study, an eco-label is a sustainability certification granted by a third-party organisation after scrutiny of underlying assets.
The Nordic Swan Ecolabel	Third-party certifying organisation which grants eco-labels to sustainable products.
Eco-labelled mutual funds	Mutual funds in which ethical claims are scrutinized by a third-party organisation and granted an eco-label.
Non-labelled ethical mutual funds	Mutual funds with an explicit stated investment strategy incorporating sustainability. These ethical claims are stated by the mutual fund managers themselves.
Conventional mutual funds	Mutual funds without any explicit stated investment strategy incorporating sustainability.

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1 INTRODUCTION

This chapter introduces the background of the research, briefly touches upon how the study was conducted, and lastly gives an outline of the structure of the thesis.

Since the 1960s, demand for sustainable investment products has increased rapidly (Bauer, Derwall & Otten 2007; Bauer, Koedijk & Otten 2005; Bioy & Stuart 2020; Climent & Soriano 2011; Leite, Cortez, Silva & Adcock 2017; Oikonomou, Platanakis & Sutcliffe 2018). In the midst of climate change that pushes eco-systems to the limit (Rob  rt et al. 2012) and increased awareness of social issues, investors have started to demand more than just quality investment products. Mutual fund companies have noticed this trend (Leite, Cortez, Silva & Adcock 2017) and thus have started to address it by creating mutual funds with sustainability as a cornerstone in the investment philosophy, these are commonly called ethical or sustainable mutual funds. However, most investors lack the possibility to scrutinize mutual funds underlying assets and therefore find difficulty in assessing mutual funds ethical claims. Further, mutual fund companies, such as banks have been involved in several scandals in recent years, perhaps diminishing customer trust (Olsson, Fock, Juhlin & Klintevall 2019; Larsson 2019). The existing information asymmetry between mutual fund companies and investors (Akerlof 1970) has led to the introduction of eco-labels such as the Nordic Swan Ecolabel, which traditionally has only labelled consumer wares but in recent years has started to label financial products.

There are few studies addressing the effect of eco-labels on financial assets demand, making the field quite uncharted. A recent study on the French mutual fund market found that mutual funds labelled with the Label ISR indeed experienced higher demand than other mutual funds. The study, however, failed to incorporate non-labelled mutual funds as a group which limits the conclusions that can be drawn from the results. Studies on eco-labels effect on demand in other industries have generally found that eco-labels generate increased demand for the products being eco-labelled (Bj  rner, Hansen & Russell 2004; Jeong & Kim 2015). Previous studies on the performance of ethical mutual funds compared to conventional mutual funds have generally found little to no difference in performance between the two groups (Bauer et al. 2005; Bauer et al. 2007; Climent & Soriano 2011; Fernandez-Izquierdo & Matallin-Saez 2007; Leite et al. 2017). Some argue that this non-existing difference is due to ethical mutual funds in fact not having more ethical assets in them (Utz & Wimmer 2014), which stresses the need for a standardized definition of ethical mutual funds. Eco-labels such as the Nordic Swan Ecolabel is a solution to this definition problem which poses difficulty for investors to evaluate ethical claims upon screening for ethical mutual funds.

To reduce asymmetric information, high-quality firms use different strategies such as warranties (Grossman 1981; Shapiro 1982), third-party certifications (Auriol & Schilizzi 2003), and branding (Etil   & Teyssier 2016) to provide transparency which increase customer trust. These signals are used to increase the incentives for consumers to choose the firm's product or service before a competitor's (Spence 1973; Etil   & Teyssier 2016). As mentioned before mutual funds managers have begun to tap into the trend of sustainable investment philosophies by claiming to invest ethically. Hence, ethical mutual funds using an eco-label as a signal to strengthen these claims gives investors less work of scrutinizing their underlying assets. This

provides investors with incentives to invest in an eco-labelled mutual fund since their cost of screening is reduced (Stiglitz 1975b). Investigation of the effect on demand for mutual funds with an eco-label, such as the Nordic Swan Ecolabel, would provide new insights to the field of sustainable investing.

The purpose of this study is to investigate ethical claims, and eco-labels (the Nordic Swan Ecolabel) and their relationship to demand for mutual funds. Hence, this study aims to shine a light on eco-labels and investigate if mutual funds should invest time and money into certifying their mutual funds with these eco-labels. In this case, investigating if the Nordic Swan Ecolabel sends a signal of quality (in terms of ethical commitment) which relates to increased demand from investors seeking to invest in ethical financial products. This is done through investigating demand differences between conventional mutual funds (group 1), non-labelled ethical mutual funds (group 2a), Nordic Swan Ecolabelled mutual funds (group 2b), and ethical mutual funds (consisting of both group 2a and group 2b). This is important both for mutual fund managers looking for ways to position their ethical mutual funds in a way that attracts the most capital and further to add to the existing literature on eco-labels for financial products.

The study divided mutual funds into three groups: conventional (group 1), non-labelled ethical (group 2a), eco-labelled mutual funds (group 2b), and ethical mutual funds (group 2a and group 2b). Ethical mutual funds were not categorised as a group as they contained both non-labelled and eco-labelled mutual funds. Conventional mutual funds consisted of mutual funds without an overarching ethical or sustainable investment philosophy. Non-labelled ethical mutual funds consisted of mutual funds with an overarching ethical or sustainable investment philosophy and further, the group eco-labelled mutual funds consisted of mutual funds labelled with the Nordic Swan Ecolabel. The group ethical mutual funds consisted of the Nordic Swan Ecolabelled mutual funds and the non-labelled ethical mutual funds. All mutual funds included in the study were actively managed equity mutual funds. The data was structured as panel data and a random effects model was used to estimate the effects of the explanatory variables.

The continuation of this thesis begins with an overview of the relevant literature on the subject, initially providing insight into definitions and trends upon which this thesis relies. This is followed by introducing research purpose, methodology used to attain results and further an overview of the results of the study. A general discussion of the results and what they mean is followed by implications for mutual fund managers. Lastly, a conclusion is presented which concludes the findings of the study and provides transparency when it comes to the shortcomings of the study and further how students and researchers in the future might eliminate these.

2 RELATED WORK

This chapter is divided into two sections. The first part in section one aims to introduce sustainability and current issues related to the topic. This is followed by, how firms engage to solve the sustainability issue and reduce their impact on society and the environment. The last part in section one consists of an explanation of the Nordic Swan Ecolabel, ending with a definition and categorisation of each group of mutual funds analysed in the study.

The second section of the chapter consists of a literature review to provide insight into previous studies relevant to the thesis. The literature review starts by explaining implications on markets exposed to asymmetric information and how to reduce it, followed by previous studies on mutual fund performance and implications of the results. The literature review's final part consists of findings of previous studies on eco-labels.

2.1 The problem of unsustainability

For most parts of human history, the impact of human intervention on the biosphere was tiny. Since the industrial revolution, however, society has grown immensely and the corresponding impact on the biosphere has grown with it. The industrial revolution has brought numerous positive developments for mankind. Technological advances have brought unprecedented growth in human welfare by developing efficient agriculture, cures for diseases, and much more. Increased life expectancy and population growth are the results of this massive paradigm shift (Robért et al. 2012).

This new way of life however has brought negative consequences as well. Human impact on the biosphere has grown to become significant. Greenhouse gas emissions from the burning of fossil fuels are changing the global climate. Flows of materials are surpassing natural flows and society is claiming more land to build cities and to use for agricultural purposes. Further, social inequality in the form of human rights abuse, worker abuse, and lack of education are still commonplace in many countries (Robért et al. 2012).

The term sustainable development encapsulates these problems and aims to move from an unsustainable society to a sustainable one, as defined by the sustainability principles (Robért et al. 2012). In a sustainable society, nature is not subject to systematically increasing:

1. concentrations of substances extracted from the Earth's crust
2. concentration of substances produced by society
3. degradation by physical means; and in that society

And people are not subject to conditions that systematically undermine their capacity to meet their needs in terms of:

4. health, influence, competency, impartiality, and meaning.

The UN have established 17 sustainable development goals to move society in a sustainable direction (United Nations 2020). These goals are not to be confused with the UN principles for responsible investments, they cover more than just investing. The goals aim to cover the entire world, ensuring a world where everyone can get their needs fulfilled in a way that does not pollute and in other ways destroy the wellbeing of people, animals, and plant life. Needs

fulfilled is defined both in terms of food and water supply as well as the right to education and reduced inequality. The goals can, therefore, be interpreted as being more of a checklist in order to reach a sustainable society whereas the sustainability principles are broader.

As a result of this widespread opinion, that society needs to move in a more sustainable direction, companies have started to work more with these issues not only to meet possible new legislation but to stay ahead of the curve. Some academics and managers argue that moving in a sustainable direction and thus staying ahead of the curve is vital in order to mitigate risk associated with sustainability (Robért et al. 2012). To address these sustainability issues, firms have started to engage in Corporate social responsibility (CSR). Further, investing in these types of companies is becoming more commonplace with the UN also having set up principles for responsible investments. This means that even in the mutual funds that are not deemed ethical, some degree of ethical (or sustainable) thought is put into investment decisions.

2.2 Corporate Social Responsibility and Socially Responsible Investments

Corporate Social Responsibility (CSR) can be translated to firms' commitments to go beyond "minimum requirements" when improving their impact on the society and environment. Firms acting in accordance with corporate social responsibility is described by the European Union as the following (European commission 2020):

1. integrating social, environmental, ethical, consumer, and human rights concerns into their business strategy and operations
2. following the law

In other words, corporate social responsibility can be viewed as firms social and environmental commitments that exceed beyond what is required by law (Liang & Renneboog 2016). However, the term corporate social responsibility is exposed to the lack of a commonly used definition. For example, there are differences between how the European Union and the US define the term. Hence, a firm can act corporately socially responsible according to laws in one country or region while failing to meet other countries regulations (Liang & Renneboog 2016). Further, the definition of corporate social responsibility is quite loose (i.e. see European definition above) leading to firms engaging in corporate social responsibility according to what best fits their core business (Liang & Renneboog 2016).

During the last decades, the term socially responsible investment (SRI) has grown in financial markets in order to respond to corporate social responsibility (Oikonomou, Platanakis & Sutcliffe 2018). Socially responsible investment strategies aim to address the growing demand for sustainable investment options. The development has led to more types of indexes to rate financial assets according to sustainability, another commonly used index is environmental social governance (ESG).

Socially responsible investments experience the same issues as corporate social responsibility, the lack of a common definition. Resulting in numerous types of mutual funds declaring themselves as sustainable (Bauer et al. 2007). For example, some mutual funds declare themselves sustainable in relation to social aspects while others in relation to

environmental aspects. Eco-labels such as the Nordic Swan Ecolabel might be one path to a more general definition.

2.3 The Nordic Swan Ecolabel

The Nordic Swan Ecolabel is an ecolabel administered and used by the Nordic countries. The label has offices in each Nordic country that administers applications within that specific country. The label is state-run and non-profit, with the goal of “Well-functioning consumer markets and environmentally, socially and economically sustainable consumption” (Nordic Swan Ecolabel 2020c).

The label aims to ensure these characteristics in the products that it labels. Companies that aim to signal their commitment to sustainability can apply for the label on specific products. The label has existed since 1989 and traditionally the products that have been eco-labelled are household goods such as toilet paper, soap, and detergents. However, in 2017 the label expanded to also integrate the labelling of mutual funds.

The Nordic Swan Ecolabel is used in this study as it mainly labels mutual funds based in Sweden, as a result, this is the region the study investigates. There are other labels similar to the Nordic Swan Ecolabel such as the ISR-label in France and the FNG-siegel in Germany, Austria, and Switzerland. In section 2.4 below the categorisation of mutual funds in the study is presented and further the explicit criteria for the Nordic Swan Ecolabel.

2.4 Categorisation of mutual funds

This section aims to illustrate the three types of mutual funds in the study, their characteristics, and how they relate to each other. These three types of mutual funds are conventional mutual funds (group 1), non-labelled ethical mutual funds (group 2a), and Nordic Swan Ecolabelled mutual funds (group 2b). Note that non-labelled ethical and Nordic Swan Ecolabelled mutual funds are subgroups of the universe of ethical mutual funds. See table 9 in the appendix for a complete list of the mutual funds in the study. How these mutual funds relate to each other in terms of categorisation can be found in figure 1 below. The mutual funds have been categorised into three different groups in order to evaluate how these groups of mutual funds relate regarding demand. This is used to draw conclusions about the Nordic Swan Ecolabel’s ability to send a signal which relates positively to demand in relation to the other groups.

The categorisation of mutual funds in this study is based on how a mutual fund aims to invest or behave and further whether they have acquired the Nordic Swan Ecolabel. This information can be found in the fund datasheet. A fund datasheet contains valuable information for investors regarding a mutual fund such as investment style and asset allocation. The structure of fund data sheets are generalized and have structural similarities independent of the mutual fund manager. These structural similarities are legislated in order to reduce information asymmetry between mutual fund managers and investors (SFS 2019:1218). In the fund data sheet managers declare investment style, for example, they can make claims about investing ethically. Therefore, scrutiny of the fund data sheets is a valuable tool to categorise ethical and

conventional mutual funds in this study. The fund datasheet has been used with the definitions found in section 2.4.2 below in order to place each mutual fund into a group.

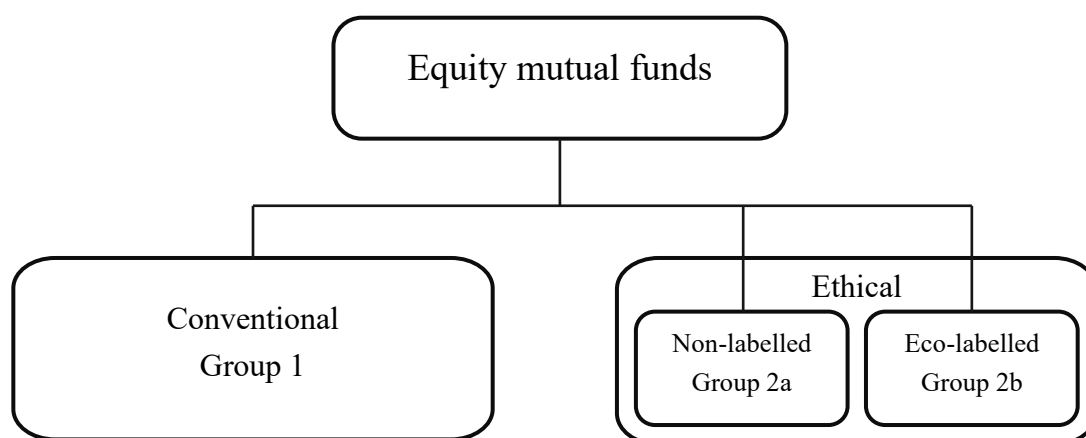


Figure 1: Categorisation of mutual funds

Illustration of the relationship between the mutual funds in the study.

2.4.1 Conventional mutual funds (group 1)

Most mutual funds follow the United Nations principles for responsible investments (or some other similar principle) but these principles are merely a subset of criteria that are considered upon investing and therefore not applicable as an ethical mutual fund (United Nations Principles for Responsible Investments), according to the definition that is presented in this thesis. Therefore, these mutual funds are categorized as conventional mutual funds. In this study, the group consisted of 157 mutual funds that were deemed to be conventional.

2.4.2 Non-labelled ethical mutual funds (group 2a)

Since there is no agreed-upon definition of an ethical mutual fund, ethical mutual funds will in this study be mutual funds that claim to be ethical. Note that mutual fund companies might have different definitions of what an ethical mutual fund is, hence, they might have different investment screens and investment commitments. Some might have screens regarding social issues and not environmental issues, others might have the opposite. Further, some might have commitments to take an active role in the companies' sustainability work and others not. Since the definition of non-labelled ethical mutual funds is ambiguous and relies on the mutual fund's claims, this study denominates ethical mutual funds ways of communicating their investment profile as ethical claims.

Upon investigating the fund data sheets, the mutual fund needs to explicitly state their dedication to ethical or sustainable investing in order to be categorised as an ethical mutual fund, for example by conducting regular ESG-analyses. This definition has been used in previous studies (Bauer et al. 2005). To ease the task of finding ethical mutual funds, some screening words have been used in the fund datasheets. These are "SRI", "CSR", "hållbar", "etisk", "miljö", "human" and "ansvar". The last five are translated as: "sustainable", "ethical", "environment", "humane" and "responsibility". These are commonly used keywords that mutual funds use to communicate their commitment to ethics and sustainability in Sweden.

These statements are per definition ethical claims in this study. Therefore, there need to be more explicit commitments regarding ethical and sustainable investing than the UN:s principles for responsible investments. In this study 46 mutual funds were deemed ethical.

2.4.3 Eco-labelled ethical mutual funds (group 2b)

Eco-labelled mutual funds have the same characteristics as the ethical mutual funds, however, they have invested time and money into an eco-label in order to signal their commitment to sustainability, thus certifying their ethical claims. Note that different labels have different requirements, hence it is hard to narrow down a general definition of requirements on sustainable labels for ethical mutual funds. However, in this study, the label studied is the Nordic Swan Ecolabel, which will define the term labelled ethical mutual fund. A mutual fund with the Nordic Swan Ecolabel must exclude the following (Nordic Swan Ecolabel 2020a):

- Companies that extract, refine or produce energy from coal, oil, natural gas and uranium (this may account for a maximum of 5% of total revenue)
- Companies that produce or sell controversial weapons
- Companies that sell conventional weapons (this may account for a maximum of 5% of total revenue)
- Companies that produce tobacco products (this may account for a maximum of 5% of total revenue)
- Companies that do not follow international standards and conventions in areas such as labour rights, ILO, human rights, corruption and environmental crime
- Government-issued bonds from countries that are subject to UN sanctions.
- Government-issued bonds from countries that have not signed the UN convention on biological diversity or the Paris treaty.
- Government-issued bonds from countries that are deemed corrupt (the country is placed in spot 70 or lower on the transparency international corruption list)

The underlying assets must also actively work with improving (reducing) their sustainability footprint. Further, the mutual fund also must include assets according to the following criteria's in order to be approved and eligible for acquiring the Nordic Swan Ecolabel (Nordic Swan Ecolabel 2020b).

- At least 90% of the mutual funds' assets must have undertaken an ESG analysis.
- At least 50% of the mutual fund's capital must be invested in companies associated with strong sustainability efforts.
- Investment in industries related to sustainability, such as renewable energy, water purification, waste management, and circular economy, are rewarded.

In order to identify the Nordic Swan Ecolabelled mutual funds, the Nordic Swan Ecolabel website has been used and this resulted in a group of 14 mutual funds.

Lastly, ethical mutual funds consist of the non-labelled ethical mutual funds (group 2a) and the eco-labelled ethical mutual funds (group 2b) that are described above in section 2.4.2 and this section (2.4.3). As can be seen in figure 1 above, both non-labelled and eco-labelled mutual funds are subgroups in the universe of ethical mutual funds. Together both group 2a and 2b consisted of 60 ethical mutual funds.

2.5 Theory of asymmetric information

Asymmetric information exists when one of two parties have more information than the other during a transaction (Akerlof 1970; Spence 1973; Stiglitz & Weiss 1981). Meaning that one party has a better position in the transaction in terms of assessing quality of the traded good and reduced uncertainty (Akerlof 1970), which could lead to problems such as adverse selection and moral hazard. Adverse selection occurs as consumers misinterpret the quality of the good, because of the lack of information presented to them. Moral hazards occur in market structures where low-quality goods can be sold at the same prices as high-quality goods (Mavlanova, Benbunan-Fich & Koufari 2012). The existence of asymmetric information could have negative impact on markets, low-quality firms could exploit the opportunity and sell goods with reduced quality to the price of high quality since buyers would not be able to assess the quality until after the purchase (Shapiro 1982). Hence, high-quality firms (which do not want to cheat) use different strategies such as warranties (Grossman 1981; Shapiro 1982), third-party certifications (Auriol & Schilizzi 2003; Etilé & Teyssier 2016) and branding (Etilé & Teyssier 2016) to strengthen trustworthiness and reduce asymmetric information between buyers and sellers. Further asymmetric information can be reduced on an institutional level. For example, legislation in Sweden has been constructed to reduce asymmetric information between investors and mutual fund managers. More specifically these legislations state that a mutual fund must declare and illustrate their underlying assets in a fund data sheet (SFS 2019:1218).

2.5.1 Markets for Lemon Problems

Asymmetric information increase buyers' risk of purchasing a good of low-quality with the belief that the product is of high-quality. This phenomenon could be described according to the market for lemons problem. This occurs when sellers have more information about a product than the buyer, creating quality uncertainty for the buyer (Akerlof 1970). A classic example of the market for lemons is the used car market, where sellers that know the car they are selling is bad (low-quality, referred to as lemons) will sell the car priced as a good (high-quality) car. If the buyer is not an expert it will be difficult to assess the quality of the car, leading to a purchase with a belief that the car is good when it is not. Good cars will not be sold to their true value, which will force sellers of good cars to leave the market while sellers of bad cars will enter. Resulting in all cars sold on the market to be of low-quality because of the asymmetric information between buyers and sellers (Akerlof 1970). In other words, asymmetric information tends to lean towards a reduction in quality (Shapiro 1982).

Ethical mutual funds might experience a case of the lemons problem. For investors with an ethical or sustainable investment strategy, ethical mutual funds will be viewed as high-quality goods and conventional mutual funds as low-quality goods. Previous studies have found that mutual funds that advertise themselves as ethical, invest in similar assets as conventional mutual funds (Utz & Wimmer 2014). Hence, there might be a case that mutual fund managers advertise or brand a mutual fund as ethical (high-quality) when the mutual fund in fact is conventional (low-quality). Further, ethical and sustainable investing lacks a generalised definition, resulting in a broad range of different types of ethical mutual funds (Climent & Soriano 2011). This leads to increased uncertainty and increased asymmetric information between investors and mutual

fund managers. However, the asymmetric information can be reduced through signalling (Spence 1973, 2002) and screening (Stiglitz 1975b).

2.5.2 Theory of Signalling

Signalling is conducted by the well-informed party during a transaction to reduce existing asymmetric information (Spence 1973, 2002). Signals can be referred to as attributes (e.g. education) which the sender (e.g. job-seeker) can alter or change in their favour to send a certain perception to a receiver (e.g. employer) (Spence 1973). High-quality firms often use signals such as warranties (Grossman 1981; Shapiro 1982), third-party certifications (Auriol & Schilizzi 2003; Etilé & Teyssier 2016) and branding (Etilé & Teyssier 2016) to strengthen trustworthiness.

Signals will inevitably have costs attached to them, so-called signalling costs. An example of a signalling cost could be the cost of education (Spence 1973). For example, the wage given by the employer will affect the level of education for an employee. If the wage does not cover the cost of education the employee will choose a lower level of education, reducing signalling costs (Spence 1973). Reputation or brands is another way to signal high-quality, but the characteristics of the term obviously creates lag in the signal. For example, in some markets a consumer can only be certain of the quality after the purchase, hence a seller's reputation increases at a post-purchase level (Shapiro 1982). Resulting in firms acquiring a time-cost when building their brand, which creates the question of whether an individual or organization should undertake certain cost for a signal?

Because of the increasing demand for more credence attributes, such as lower environmental impact, firms face growing issues of how to signal these qualities (Auriol & Schilizzi 2015). It is difficult for consumers to efficiently scrutinize for example environmental impact from production or interpret their findings because of the existing imperfect information. Hence, one solution to the matter could be for firms to gain certifications (Auriol & Schilizzi 2003). However, certification can be very costly in some cases and as Spence (1973, 2002) concluded, the deliverer of a signal will only undertake signalling costs with expectations of future profit.

2.5.3 Theory of Screening

Opposite to signalling, screening is conducted by the uninformed party in a transaction, exposed to asymmetric information, to assess quality (Stiglitz 1975a, 1975b; Stiglitz & Weiss 1981). The screening process is often conducted by sorting out undesired characteristics and abilities rather than inclusion. A process that is costly since it requires monitoring entities and/or assessing information and impressions (Stiglitz 1975a). For example, when banks stand before the decision whether to grant a borrower a loan, the bank must screen borrowers through screening devices such as interest rates to determine the risk of the loan (Stiglitz & Weiss 1981).

Another example of screening could be in the manufacturing industries, where supervisors sometimes must monitor the work process to assess labour capacity. However, in this case, the screening device is a person (the supervisor), who tries to determine if workers might be overqualified in relation to production rate (Stiglitz 1975a). Workers whose abilities are of high-quality in relation to work will tend not to inform their supervisors if the individual return (i.e.

status or higher wage) from doing so are zero. Hence, managers experience skewed information from employees, since employees will have higher incentives to inform managers when tasks are too difficult rather than too easy (Stiglitz 1975a).

The cost of screening in the manufacturing example is the wage paid to the supervisor. Hence, manufacturing firms will only screen the labour capacity if believed profits exceed previous profit plus the screening cost (Stiglitz 1975b). The same reasoning goes for all types of screening, that the uninformed party will only pursue screening if future profit is expected to exceed the cost. The same applies to investors, who undertake a participation costs when analysing mutual fund information to screen out which mutual funds they should not invest in (Cashman et al. 2012; Huang et al. 2007).

In summary, to reduce asymmetric information, tools such as signalling and screening can be applied. In the case of mutual fund investments, investors will screen mutual funds if they believe in a future profit. Screening is time costly and there is difficulty in assessing the findings, especially for private investors. When investing sustainably, the screening process becomes even more difficult because of the lack of a standardized definition for ethical mutual funds and further because of investors difficulty of scrutinizing mutual funds ethical claims. Another way of solving the existing asymmetric information could be for mutual fund managers to acquire third-party certifications such as eco-labels to signal commitment to ethical and sustainable investing. Using an eco-label instead of just branding a mutual fund as ethical could enhance trustworthiness when it comes to sustainability claims in the mutual fund. Further, eco-label acts as a standardized definition from which investors could compare ethical mutual funds sustainability claims.

2.6 Previous research on ethical mutual funds

Ethical mutual funds is a debated area within investing. Theoretically, there are some arguments claiming overperformance, neutral performance and underperformance compared to conventional mutual funds (Climent & Soriano 2011; Leite et al. 2017). Overperformance is often attributed to ethical mutual funds reducing social and environmental risk due to difficulties of pricing CSR (Climent & Soriano 2011; Renneboog et al. 2008). Further, some claim that rigorous screening activities help fund managers pick the winning stocks (Renneboog et al. 2008). There are many arguments for underperformance, arguably the most prevalent one is reduced ability to diversify and pursue profitable opportunities due to investment screens (Climent & Soriano 2011; Geczy, Stambaugh & Levin 2005;). Neutral performance is often attributed to small differences in assets and that certain areas are mature with regards to companies within them (Bauer et al. 2007; Leite et al. 2017). Neutral performance and slightly reduced performance are the most widely empirically observed scenarios (Bauer et al. 2005; Bauer et al. 2007; Climent & Soriano 2011; Fernandez-Izquierdo & Matallin-Saez 2007; Leite et al. 2017).

This leads to the important question, are ethical mutual funds more ethical than conventional mutual funds? Some say that the term ethical mutual fund is a term that embodies to many variables (Climent & Soriano 2011). There might for example be certain aspects of ethical investing that are well received by investors and others that are not. This makes it

difficult to research whether there are performance differences between ethical and conventional mutual funds. Some studies that have found insignificant results between ethical and conventional mutual funds claim that they seem to invest in largely the same types of assets (Bauer et al. 2005; Bauer et al. 2007; Leite et al. 2017). Whether ethical mutual funds invest in what they promise or not, is a debated issue. Some claim that ethical mutual funds invest in the same amount of ethical assets as conventional mutual funds. In other words, they claim that ethical and conventional mutual funds are the same (Utz & Wimmer 2014). Other studies show that it depends on what company is managing the mutual fund. Some take their commitments to ethical investing more seriously than others (Wimmer 2013). However, some find that ethical mutual funds indeed have more ethical investments in their portfolios (Kempf & Osthoff 2008; Beson et al. 2006). The fact that this is a debate in conjunction with a possible diminishing trust in banks / mutual fund companies, is believed to make investment decisions for investors that place a high value on ethics and sustainability more difficult.

Researchers, as a result of this stress the need for decreased information asymmetry between customers and mutual fund companies (Bauer et al. 2007; Leite et al. 2017). Third-party certifications such as eco-labels might be one solution to this problem. Further, since the growing body of literature suggests that ethical mutual funds tend to perform similarly as their conventional counterparts (Bauer et al. 2005; Bauer et al. 2007; Climent & Soriano 2011; Fernandez-Izquierdo & Matallin-Saez 2007; Leite et al. 2017), demand is not believed to be biased in any direction as a result of ethical mutual funds showing poor performance.

2.7 Previous research on eco-labels

Eco-labels on sustainable or ethical products as a means of minimizing information asymmetry between buyer and seller has been researched both theoretically and empirically. Theoretical contributions have shown that third-party certification such as eco-labels, as a means of signalling high quality (in this context sustainability) is more effective than seller reputation and “cheap talk” signalling (Cason & Gangadharan 2002). “Cheap talk” signalling is in this context referred to as promises from the company regarding the quality of their products. Further, research has shown that eco-labels increase the possibility of over-compliance (with regards to sustainability-related issues) to be profit-maximizing (Kirchhoff 2000).

Empirically, most studies have shown that eco-labels increase demand for products in a variety of industries. Research on consumer products, such as toilet paper and detergents labelled with the Nordic Swan Ecolabel has shown that consumers' marginal willingness to pay increases by 13-18% for these products (Bjørner et al. 2004). Jeong and Kim (2015) showed that consumer appliances with eco-labels were preferred over other appliances. Still, other factors such as electricity consumption were more important in explaining customer preferences than an eco-label, covering other areas such as carbon footprint in manufacturing processes (Jeong & Kim 2015).

Eco-labels within mutual funds is a scarcely investigated area. In 2017, an article was published aiming to see if the market valued labelled ethical mutual funds higher than non-labelled ethical mutual funds. The label investigated was the ISR-label, which is a French eco-

label much akin to the Nordic Swan Ecolabel. That is, the ISR-label is a third-party organisation which scrutinises, and labels mutual funds based on ethical and sustainable criteria, just like the Nordic Swan Ecolabel. The methodology consisted of matching conventional mutual funds that had a high score within ESG, and mutual funds labelled with the ISR-label, to investigate which of the funds had grown the most, in terms of money managed. The study showed that the mutual funds labelled with the ISR-label indeed had grown more than the conventional mutual funds and therefore concluded that the market valued the ISR-label favourably (Bilbao-Terol et al. 2017). However, the mutual funds that were compared did not have to advertise themselves as sustainable or ethical. This means that the basis for the research was solely dependent on what types of assets the mutual funds invested in, which as mentioned is difficult for an individual investor to scrutinize. It is therefore argued that the labelled ethical mutual funds had an unfair advantage due to them actively trying to signal their commitment to sustainability and the others did not. To clarify, the ISR-labelled mutual funds actively signalled their commitment to sustainability and the conventional mutual funds only happened to invest in ethical assets, therefore scoring high within ESG. If these matched conventional mutual funds had advertised themselves as ethical or sustainable, investors would deem these as ethical mutual funds, which might have skewed the value of the ISR-label. Still, there might be elements of truth, especially concerning the growth of ethical mutual funds.

Summarizing the chapter, sustainability is of growing concern and as a result, companies have started to work with issues related to CSR and big organisations such as the UN have laid out a foundation for responsible investments. Many companies want to be at the forefront of sustainability in order to mitigate risk associated with for example changes in legislature. Investors interested in investing in an ethical or sustainable way can expect to find large differences between ethical mutual funds. Some ethical mutual funds invest in environmentally friendly companies, others in socially responsible companies and some invest in both. Ethical mutual funds also have very different “goals”, some may not invest more than 5% in weapons others have a zero-tolerance policy towards weapons. This lack of a definition accompanied by several other factors have given rise to eco-labels such as the Nordic Swan Ecolabel. The Nordic Swan Ecolabel can be applied for by mutual fund companies and guarantees that a mutual fund lives up to a wide array of ethical benchmarks.

Ethical investing is a debated issue, both when it comes to performance and whether ethical mutual funds live up to their claims. When it comes to performance, the consensus seems to be that ethical mutual funds experience the same performance as conventional mutual funds. There seems to be no real consensus when it comes to whether ethical mutual funds live up to their claims. Some say that they invest in the same assets as conventional mutual funds and others say that they invest in more ethical assets. This clearly shines a light on the information asymmetry between investors and mutual fund companies that the Nordic Swan Ecolabel might solve. The Nordic Swan Ecolabel could reduce the information asymmetry and the potential lemons problem attached to it, minimizing screening costs for investors by signalling commitment to sustainability. Previous research on eco-labelling is quite heavily skewed in favour of eco-labels as most of the research seems to indicate increased demand for eco-labelled products. The majority of this research has been conducted in other industries than the mutual fund market which leads to the research purpose of this study.

3 PURPOSE, RESEARCH QUESTIONS AND HYPOTHESES

This chapter outlines the purpose of the study and ends with the development of two research questions and hypotheses to answer them.

3.1 Research purpose

The purpose of this study is to investigate ethical claims, and eco-labels and their relationship to demand for mutual funds. Ethical claims are the statements ethical mutual funds use to communicate their commitment to investing in a sustainable and ethical way, a more in-depth definition by the authors can be found in section 2.4.2 above. Hence this study aims to shine a light on eco-labels and study if mutual funds should invest time and money into certifying their mutual funds with eco-labels to communicate their commitment to sustainability. That is, it aims to investigate if the eco-label (in this case the Nordic Swan Ecolabel) sends a signal of quality (in terms of ethical commitment) which increases demand from investors seeking to invest in ethical financial products. This is done through investigating demand differences between ethical mutual funds (eco-labelled and non-labelled combined), Nordic Swan Ecolabelled mutual funds, non-labelled ethical mutual funds, and conventional mutual funds. If there is no difference between the demand of an eco-labelled ethical mutual fund and a non-labelled ethical mutual fund, there is no incitement for mutual fund managers to invest time and effort into getting an eco-label. If the signal the sustainability label is sending to customers relates positively to demand for the product, mutual fund managers should consider certifying their mutual funds (assuming their sustainability claims are valid).

Research on the topic of eco-labelled ethical mutual funds is scarce since labels regarding ethical and sustainable investing in the mutual fund world are of young age. However, a study was conducted in 2017 showing that eco-labelled mutual funds in France enjoy higher demand than conventional mutual funds (Bilbao-Terol et al. 2017). The study did not compare eco-labelled funds with non-labelled ethical mutual funds, which is of importance to fund managers that aim to introduce ethical investment products with the highest possible demand. Some researchers also stress the importance of eco-labels as a means of reducing information asymmetry between investors and mutual fund managers (Bauer et al. 2007). This goes hand in hand with studies that have shown that differences between assets in ethical mutual funds and conventional mutual funds are small (Utz & Wimmer 2014), further stressing the importance of third-party certifications such as eco-labels.

Because investors undertake participation costs when analysing new mutual funds (Cashman et al. 2012; Huang, et al. 2007), there might be a case that ethical mutual funds can reduce this cost for investors by acquiring an eco-label. Further, investors often lack the knowledge required in order to scrutinize mutual funds' ethical claims. Investors that are familiar with the eco-label, could decrease their time and effort (Huang et al. 2007) in finding ethical mutual funds by looking for eco-labelled ethical mutual funds. Hence, investors would be able to draw conclusions, when investing in new mutual funds, much faster than they would without the familiarity of the certification. In other words, this type of third-party certification

could lead to a reduction of asymmetric information between the investor and the mutual fund manager and further minimize screening costs.

3.2 Research questions and hypothesis development

Previous research and reports state that there is an increasing demand for ethical mutual funds (Bauer et al. 2007; Bauer et al. 2005; Bioy & Stuart 2020; Climent & Soriano 2011; Leite et al. 2017; Oikonomou et al. 2018). What is the effect of this increased demand compared to mutual funds that are not deemed ethical in Sweden? Increasing demand for ethical mutual funds leads to the following research question:

Research Question 1: How do ethical claims relate to demand for mutual funds?

Note that ethical claims are the statements ethical mutual funds use to communicate their commitment to investing in a sustainable and ethical way, see definition in section 2.4.2. To answer this research question, three hypotheses have been developed. The literature and financial reports point to increased demand for ethical investments (Bauer et al. 2007; Bauer et al. 2005; Bioy & Stuart 2020; Climent & Soriano 2011; Leite et al. 2017; Oikonomou et al. 2018). Hence, the first hypothesis investigates ethical mutual funds, which include both non-labelled ethical mutual funds (group 2a) and eco-labelled mutual funds (group 2b). The first hypothesis is:

H1: Ethical mutual funds experience higher demand than conventional mutual funds.

Since ethical mutual funds in this study incorporate both Nordic Swan Ecolabelled mutual funds (group 2b) and non-labelled ethical mutual funds (group 2a), investigating the components is of interest. Mutual funds that do not have the Nordic Swan Ecolabel but claim to be ethical should also have a higher demand compared to conventional mutual funds, since the literature and reports point to increased demand for ethical investments (Bauer et al. 2007; Bauer et al. 2005; Bioy & Stuart 2020; Climent & Soriano 2011; Leite et al. 2017; Oikonomou et al. 2018), leading to the following hypothesis:

H2: Non-labelled ethical mutual funds experience higher demand than conventional mutual funds.

Further, the reduced screening cost for mutual fund investors (Stiglitz 1975b), potential signal value of the Nordic Swan Ecolabel (Spence 1973, 2002), empirical findings within eco-labelling (Bilbao-Terol et al. 2017; Bjørner et al. 2004; Jeong & Kim 2015) and increasing demand for socially responsible investments (Bauer et al. 2007; Bauer et al. 2005; Bioy & Stuart 2020; Climent & Soriano 2011; Leite et al. 2017; Oikonomou et al. 2018) strengthen the beliefs that ethical mutual funds with the Nordic Swan Ecolabel should experience higher demand than conventional mutual funds. The effect of the Nordic Swan Ecolabel on demand is believed to be higher compared to previous hypotheses, due to the arguments mentioned in this paragraph. This leads to the following hypothesis:

H3: Nordic Swan Ecolabelled mutual funds experience higher demand than conventional mutual funds.

These hypotheses will be assessed in terms of customer demand of the investment product, more specifically flow of capital into the mutual fund. The hypotheses are formulated stepwise,

gradually narrowing in on the research question. Note that the term ethical mutual funds incorporate both the non-labelled ethical (group 2a) and the eco-labelled mutual funds (group 2b).

The signalling part in a transaction will only pursue a signal if it outweighs its signal cost (Shapiro 1982; Spence 1973). Since it is hard for investors to scrutinize mutual funds underlying assets, acquiring a signal (e.g. third-party certification) could increase demand, because investors would not have to invest time (screening cost) to analyse the mutual fund. Previous research has urged the need for a standardised definition of ethical mutual funds (Bauer et al. 2007), which an eco-label could solve. The reduced screening cost for mutual fund investors, potential signalling value, empirical findings within eco-labelling (Bilbao-Terol et al. 2017; Bjørner et al. 2004; Jeong & Kim 2015) and increasing demand for socially responsible investments leads to the following research question:

Research Question 2: How do eco-labels, in this case, the Nordic Swan Ecolabel relate to demand for ethical mutual funds?

Since there is ambiguity in the definition of an ethical mutual fund (Utz & Wimmer 2014) and a potential distrust of banks and mutual fund companies because of recent scandals (Olsson et al. 2019; Larsson 2019), an eco-label might solve the asymmetric information problem between investor and mutual fund manager (Akerlof 1970). Investors lack the time and (often) competency in order to scrutinize mutual funds' assets making the eco-label a potential signal of credible ethical claims (Spence 1973). In other words, an eco-label reduces screening costs for investors seeking ethical investments (Stiglitz 1975a), which should relate positively to demand for eco-labelled mutual funds. Further, fund managers would not pursue a signal which does not outweigh the signal cost (Shapiro 1982; Spence 2002), in this case, the cost of acquiring the Nordic Swan Ecolabel. The theory of signalling, therefore, supports the argument that the Nordic Swan Ecolabel should increase demand for eco-labelled mutual funds. Further, previous research shows that eco-labelled products in various industries relate positively to demand compared to non-labelled products (Bilbao-Terol et al. 2017; Bjørner et al. 2004; Jeong & Kim 2015). These arguments lead to the following hypothesis:

H4: Nordic Swan Ecolabelled mutual funds experience higher demand than non-labelled ethical mutual funds.

As mentioned above, the Nordic Swan Ecolabel is believed to relate positively to demand as compared to non-labelled ethical mutual funds. If this is true, how has the eco-label changed the demand for the mutual funds that have acquired the Nordic Swan Ecolabel? Since previous research shows that eco-labelled products experience higher demand than non-labelled products (Bilbao-Terol et al. 2017; Bjørner et al. 2004; Jeong & Kim 2015), it should be the case that a mutual fund experiences higher demand upon receiving an eco-label. In an attempt to capture the whole picture and rule out the possibility of eco-labelled mutual funds being high-quality and thus having high demand before acquiring the label, the following hypothesis is investigated.

H5: Nordic Swan Ecolabelled mutual funds experience increased demand after acquiring the label.

In the following chapter, it is explained how the thesis has been conducted in order to provide answers to the hypotheses and research questions.

4 METHOD

This chapter covers a broad description of the research design, how data was collected, clarification of the grouping among mutual funds, operationalization of variables. Ending with an explanation of the regression model for the study.

4.1 Research Design

To approach the research questions, the study was divided into two parts. The first part consisted of identification of the mutual funds and categorisation of these into three groups. Firstly, a screening based on mutual fund properties was conducted in Thomson & Reuters Eikon and further a manual screening was conducted on the retrieved data. The Thomson & Reuters Eikon screening was a rough screen based on fund properties and the manual screen was conducted by scrutinizing each fund's datasheet. An in-depth explanation of the screening activities can be found in section 4.2 below. The first group consisted of conventional mutual funds (group 1), the second group of non-labelled ethical mutual funds (group 2a), and the third group consisted of Nordic Swan Ecolabelled mutual funds (group 2b). Clarification regarding categorisation of mutual funds can be found in section 4.3.

The second part of the study consisted of the analysis of the groups' relation to demand, in order to determine potential signal value of the Nordic Swan Ecolabel. Due to the nature of the data collected, panel data regression was appropriate. In order to run this type of regression, the data was organized into panel data, which is both cross-sectional and time-series data. Panel data regression gives valuable insight into how strong the effect of different variables are in relation to each other. Since the regression model holds all other independent variables fixed when changing one independent variable, each independent variable's contribution to the dependant variable is calculated. The statistical tests and regressions for the random and fixed effect models have been calculated with the software R, which is an open-source software. The same panel data regression models could be conducted in other software such as Stata. The choice of using R for the statistical tests and regressions was based on the authors' previous knowledge of the software.

4.2 Data Collection

Secondary data on daily net asset value (NAV), in SEK, monthly total net asset value (TNA), in million SEK, how many years the mutual fund had been active and expense ratio for each of the chosen mutual funds was gathered using Thomson & Reuters (recently renamed to Refinitiv) Eikon. Thomson & Reuters Eikon is a commonly used database, that has been used in previous studies when gathering financial data (Climent & Soriano 2011; Kempf & Osthoff 2008; Leite et al. 2017; Renneboog et al. 2008). Thomson & Reuters Eikon is a paid service that provides all necessary information regarding the mutual funds in the study. The database has over 65 years of information on financial assets in 150 countries, covering 99 percent of the global market capital. Further, Thomson & Reuters Eikon has over 2000 global sources from which the database gathers data (Refinitiv 2020). Along with an extensive database, Thomson

& Reuters Eikon provides software such as Eikon Excel and screening tools which made it possible to collect the needed data for the study in a manageable way.

The time series for the data collected stretched from the first of January 2016 to the last of December 2019. This has been done in order to capture the demand relation between the different types of mutual funds.

Upon collecting data, the fund screener tool in Thomson & Reuters Eikon was used. In the fund screener tool, criteria can be stated in order to filter funds based on these. The fund screener tool acted as the first rough filter for the mutual funds included in the study. The criteria's stated were:

- Asset status is active - The fund is still active
- Asset universe is mutual funds - The filter only includes mutual funds
- Asset currency is SEK - The mutual fund is traded in SEK.
- Asset type is equity - The filter rules out non-equity mutual funds (e.g. bonds)
- Fund TNA greater than 10 million SEK - used to rule out "boutique" mutual funds
- Launch date is before 2018-01-01 - used to rule out new mutual funds with small data sets that do not have a large impact on overall the data sample and to eliminate possible new-comer bias.

This first screening gave 301 mutual funds, not excluding index funds. Manual screening identified 22 index funds that were removed from the sample. This resulted in an initial data sample consisting of 279 mutual funds.

The second screening of the data sample was conducted by screening the fund datasheets. In this screening, 25 additional index funds and one bond was found and removed from the sample. Keywords such as "SRI", "CSR", "hållbar", "etisk", "miljö", "human" and "ansvar" were used in order to find ethical mutual funds that did not include their ethical profile in the name. Further, these mutual funds had to state an explicit commitment to ethical or sustainable investing, for example by conducting regular ESG-analyses. 36 mutual funds were inconsistent in their monthly reports of TNA and others reported a static NAV during long periods. The static NAV made it impossible to calculate monthly volatility and hence they were excluded from the data sample. Further, irregularities in TNA reports made a mapping of intertwined data impossible, thus these 36 mutual funds were excluded from the study. Since these mutual funds fit the sample of the study but could not be used they have been included in table 11 in the appendix for transparency. If this type of irregularities would have been included, the data would have had to be manipulated (and difficult to replicate) in order to fit corresponding data. The resulting dataset consisted of 217 mutual funds with 10 223 monthly data points.

To categorise the mutual funds into groups, the definitions in section 2.4 above were used upon reading the fund datasheet. From these 217 mutual funds, 46 were non-labelled ethical mutual funds (group 2a), and 14 were labelled with the Nordic Swan Ecolabel (group 2b), the other 157 were deemed conventional (group 1). See table 1 for an overview of the mutual funds in the study and table 9 in the appendix for a complete list of the mutual funds.

Table 1: Overview of the mutual funds included the study

Illustration of the funds with the highest and lowest TNA. Funds in the middle of the sample are also illustrated. Further, launch date, information if the mutual funds are deemed to be ethical and have acquired the Nordic Swan Ecolabel are presented in the table.

Mutual fund	TNA Million SEK(2019-12-30)	Launch Date	Ethical	Eco-labelled
1. Swedbank Robur Allemansfond Komplet	65 595	1989	No	No
2. Swedbank Robur Aktiefond Pension	52 884	1999	No	No
3. Swedbank Robur Technology	48 262	1983	No	No
107. Spiltan Globalfond Investmentbolag	1 987	2016	No	No
108. Ethos Aktiefond	1 982	2006	Yes	No
109. Swedbank Robur Global High Dividend	1 977	2013	No	No
215. IKC Fastighetsfond A	26	2015	No	No
216. IKC Global Infrastructure A	11	2013	No	No
217. CB Save Earth Fund	11	2008	Yes	Yes

Source: Mutual funds with their TNA and launch date have been gathered from Thomson & Reuters financial database Eikon. Ethical claims have been manually screened from each respective mutual fund datasheet. Finally, information on funds that are eco-labelled has been gathered from the Nordic Swan Ecolabel.

4.3 Categorisation of mutual funds

When screening which of the 217 mutual funds should make it into the category “Eco-labelled ethical mutual funds” Nordic Swan Ecolabel’s official website was used. Since, there is only one eco-label used in the Swedish financial market no others could be included, which resulted in 14 mutual funds making it into the category.

For the categorisation of the group non-labelled ethical mutual funds, an investigation of each mutual fund’s data sheet was conducted. The investigation aimed to find explicit statements linked to either corporate social responsibility or socially responsible investments. More specifically, the investigation was conducted by screening for keywords, commonly associated with ethical investments, in the fund datasheets. These were: “SRI”, “CSR”, “hållbar”, “etisk”, “miljö”, “human” and “ansvar”. Further, these mutual funds had to state an explicit commitment to ethical or sustainable investing, for example by conducting regular ESG-analyses. The screening resulted in a total of 46 mutual funds making it into the category non-labelled ethical mutual funds. Note that most mutual funds follow the UN principles of responsible investing, this does not categorise them as ethical mutual funds in this study, as it is not an overarching investment philosophy as mentioned in the literature review.

Ethical mutual funds consisted of both the Nordic Swan Ecolabelled mutual funds and the non-labelled ethical mutual funds resulting in a total of 60 ethical mutual funds.

Finally, the remaining 157 mutual funds were deemed as conventional. Since they did not have any eco-label or explicit statements regarding either corporate social responsibility or socially responsible investment. An illustration of the different categories and how they are related can be found in table 2 below. A complete list of the mutual funds in this study can be found in the appendix, table 9.

Table 2: Mutual fund categorisation

Illustration of the different categories of mutual funds along with some characteristics for each category. The variables Total net asset, Natural logarithm of TNA, Expense ratio, and Number of years active are presented in average values over the entire time-period for each of the mutual fund groups.

	Conventional mutual funds (Group 1)	Ethical mutual funds	
		Eco-labelled (Group 2b)	Non-labelled (Group 2a)
Number of funds	157 (72.35%)	14 (6.45%)	46 (21.20%)
Monthly data points	8105 (79.28%)	352 (3.45%)	1766 (17.27%)
Total net assets (TNA) in mSEK	6 333	3 585	3 388
Natural logarithm of TNA (ln(TNA))	21.59	20.97	21.18
Expense ratio	1.51	1.30	1.24
Number of years active	18.36	18.19	16.49

4.4 Panel data

The data in the thesis was organised as panel data. The term panel data refers to data that is combined with two subscripts, time-series and cross-sectional. The time series refers to an entity's data which can range over different time periods. One example could be daily returns for a traded stock. Cross-sectional information refers to the data of several different entities that are constrained to a single time period (Westhoff 2013).

In this thesis, the time series period (m) is in months and the cross-sectional information (i) is the mutual fund name. Panel data can be structured either balanced or unbalanced. Balanced panel data contains observations for every entity at every given period in the time series. Unbalanced panel data however does not contain observations for every entity at every given time period, and hence is not a complete series (Westhoff 2013). In this study, the panel data is unbalanced due to some mutual funds launching later than 2016-01-01. Some mutual funds have been ruled out in the previously mentioned screening since they launched later than 2018-01-01.

Upon estimating a panel regression there are two types of models, fixed effects and random effects models. In order to determine which model to use a Hausman test has been carried out. In the case of this study, a fixed effects model could not be used upon answering research question 1 and parts of research question 2, since the fixed effects estimator drops dummy variables and subsequently leaves no results for the study. This might mean that the results of the regression analysis are skewed since the Hausman test suggested a fixed effects model due to correlation between error terms and regressors, which is common in modelling complex

problems (Greene 2002). A virus in China might for example correlate quite heavily with the risk-adjusted returns of mutual funds investing in that region. It is to be expected that the regressors are correlated with the error term since mutual fund prices and further inflow of capital is a complicated web of events affecting each other.

As a means of making the model as accurate as possible, previous research modelling inflow of capital has been used to incorporate as many explaining variables as possible and further mitigate the risk of omitted variable bias that causes correlation between regressors and error terms. Still as stated the model used might be inconsistent, possibly making it difficult to replicate the research. There was no alternative to using a random effects estimator and results that might be somewhat inconsistent were preferred to no results. However, upon answering hypothesis 5 (subject to research question 2), a fixed effects model was used since regression within the group eco-labelled ethical mutual funds (group 2b) was carried out.

Lastly, statistical testing has been conducted in the software R, which is an open-source software. Other software such as Stata can also be used to replicate the study.

4.5 Operationalization of variables

4.5.1 Dependent variable

To determine customer demand for mutual funds, in line with previous studies, inflow of capital has been used as the dependent variable (de Mingo-López & Matallín-Sáez 2017). Estimating inflow of capital however is a somewhat difficult task, due to the lack of specific data. This has resulted in researchers estimating the inflow of capital into a mutual fund in two ways (de Mingo-López & Matallín-Sáez 2017).

The first one uses implied flow, which measures the fund size during a given period minus the appreciation of the fund size in the previous period. In this approach, TNA is used as a determinant of fund size. This is a rough estimation mainly due to it not accounting for capital flowing into the fund continuously throughout the given period (month or year) but rather assumes that the cash flow occurs at the period's end. Further, it assumes that all dividends are reinvested into the mutual fund (de Mingo-López & Matallín-Sáez 2017). The implied flow is calculated by subtracting the TNA of the previous month (m-1) multiplied by the returns in month (m-1), from the TNA of month (m). Further, it is divided by the TNA from previous month (m-1).

$$Implied\ Flow_{i,m} = \frac{TNA_{i,m} - TNA_{i,m-1} * (1 + R_{i,m})}{TNA_{i,m-1}} \quad (1)$$

The second approach uses total inflow of capital (sales) subtracted by total redemptions from investors during month (m). This is divided by TNA for the previous month (m-1) in order to obtain net cash flow for fund (i) at month (m). This approach measures actual net cash flow and thus is superior compared to using implied flow, however it relies on fund data that is not available for some countries and databases.

$$Net\ Cash\ Flow_{i,m}^1 = \frac{Sales_{i,m} - Redemption_{i,m}}{TNA_{i,m-1}} \quad (2)$$

Due to constraints in ability to find inflow and redemptions for the mutual funds in Eikon, the implied flow approach has been deemed acceptable since other studies have used it in the past (Barber, Odean, & Zheng 2005; Cooper, Gulen, & Rau 2005; Gruber 1996; Guercio & Reuter 2014; Huang et al. 2007; Jayaraman, Khorana, & Nelling 2002; Zhao 2005).

4.5.2 Independent variables

Performance has been concluded as a determinant factor in explaining inflow of capital into a mutual fund (Cashman et al. 2012). Because of the importance of performance in modelling inflow of capital into a fund, this study incorporates the *Sharpe ratio* as an independent variable. Upon estimating demand, previous studies have used performance as an explanatory variable in regression models (Cashman et al. 2012; Huang et al. 2007), where performance has been defined as returns and volatility. Other previous studies evaluating performance between different kinds of mutual funds use risk-adjusted returns as a measure of performance. Since the studies estimating demand has used returns and volatility, which are components of risk-adjusted returns and that other studies evaluating performance have used risk-adjusted returns, this study uses the *Sharpe ratio* as a measure of performance. Other ways of capturing risk-adjusted returns are the Jensen index and the Treynor ratio. However, these have been deemed unfit due to them not accounting for idiosyncratic risk (Jensen 1968).

In this study, *Sharpe ratio* for each mutual fund (i) at month (m) has been calculated by taking monthly returns divided by monthly volatility. Note that the *Sharpe ratio* has not been calculated using excess returns (Sharpe 1966), due to commonly used rates such as the STIBOR rate during the investigated time period has been negative. Therefore, it is modified by removing excess returns from the formula, but still, it is denominated as *Sharpe ratio*.

$$Sharpe\ Ratio_{i,m} = \frac{Monthly\ Return_{i,m}}{Monthly\ Volatility_{i,m}} \quad (3)$$

To calculate each mutual fund (i)'s monthly volatility, daily returns were calculated by subtracting the NAV at day (t) with previous day's (t-1) NAV. Further, to provide daily returns in percentage change between day (t-1) and day (t), the difference between both days NAV was divided by previous day's (t-1) NAV.

$$Daily\ Return_{i,t} = \frac{NAV_{i,t} - NAV_{i,t-1}}{NAV_{i,t-1}} \quad (4)$$

To provide the volatility of month (m) for each mutual fund (i), monthly standard deviation of the daily returns of month (m) were calculated.

¹ Net cash flow is not used to estimate inflow/ outflow of capital in this study. It is incorporated in the method to high-light the shortcomings of using implied flow.

$$Monthly\ Volatility_{i,m} = \left(\frac{1}{N} * \sum_{t=1}^N (Daily\ Return_{i,t} - Mean\ Daily\ Return_{i,m})^2 \right)^{\frac{1}{2}} \quad (5)$$

$$Mean\ Daily\ Return_{i,m} = \frac{1}{N} * \sum_{t=1}^N Daily\ Return_{i,t} \quad (6)$$

In order to calculate monthly returns for each mutual fund (i), the NAV of the first trading day (t_{start}) in month (m) was subtracted from the NAV of the last trading day (t_{end}) of month (m) and further divided by the NAV of the first trading day (t_{start}).

$$Monthly\ Return_{i,m} = \frac{NAV_{i,t_{end}} - NAV_{i,t_{start}}}{NAV_{i,t_{start}}} \quad (7)$$

To account for the label effect, a dummy variable having the value 0 or 1 has been included in the regression model. Eco-labelled mutual funds have the value 1 and the other mutual funds have the value 0. Previous studies have used dummy variables in regression models upon investigating the effect of labels (Bjørner et al. 2004).

Further, to distinguish demand differences between ethical and conventional mutual funds a dummy variable called ethical has been introduced. If the mutual fund is deemed ethical it will have the value 1 and if it is not it will have the value 0. Note that both eco-labelled and non-labelled ethical mutual funds will be covered by this variable thus having the value 1.

4.5.3 Control variables

It might be the case that large, well-established mutual fund companies benefit less from having an eco-label in terms of relation to demand for their mutual funds. It might also be the case that they have more demand in general. This has been discussed in previous studies, where it is mentioned that investors have varying degrees of familiarity with smaller brands and therefore might invest in funds they are familiar with (Huang et al. 2007). To account for this, this study includes a dummy control variable for the mutual fund company's size, where large well-established companies are 1 and small less established companies are 0. This variable is called *large mutual fund company dummy*. Large, well-established companies are distinguished by dividing the mutual fund companies according to total turnover. Mutual fund companies with less total turnover than 400 000 000 SEK were deemed as small mutual fund companies in this study. This limit was constructed based on what turnover the large mutual fund companies, such as Swedbank, Nordea, and other well-known mutual fund companies reported, to distinguish these from small, less well-known mutual fund companies. The total turnover for each mutual fund company was checked upon reading each fund datasheet.

Further, a control variable for geographic investment area was used. Geographic investment areas were divided into Nordic countries and others. This variable is called *Nordic market dummy*. Since many mutual fund companies based in Sweden offer Nordic investment products, while these constitute a small part of the global stock market, it might be unfair to measure demand differences between the two. Further, investors tend to own a disproportionate amount

of assets based in their home market, a phenomenon called equity home bias (French & Poterba 1991). The *Nordic market dummy* aims to control for this possible effect. The control variable was screened for upon reading the fund datasheets.

Years active, which is a variable capturing how many years a mutual fund has been active was included to control for possible demand differences between well-established old mutual funds and new less well-established mutual funds. Previous studies have used *years active* to capture these differences (Cashman et al. 2012). *Years active* was calculated by gathering data about each mutual fund's starting year from Eikon and adding one year for every year since then.

Expense ratio was included to control for cost differences between the mutual funds. Other studies have used *expense ratio* to capture demand differences as a result of cost differences between mutual funds (Cashman et al. 2012). The *expense ratio* was gathered from Eikon and averaged over the time period for each mutual fund.

4.6 Descriptive statistics

In table 3 below the descriptive statistics for the data sample can be found. The sample consists of 217 mutual funds traded in Sweden, with data from 2016-01-01 to 2019-12-31. There are 10 223 monthly observations during this period. Total net assets (TNA) is the amount of money managed within a mutual fund, which is usually reported on a monthly basis. Implied flow is calculated from the TNA as stated before and is the amount of new money invested in the fund. $\ln(\text{TNA})$ is the *natural logarithm of TNA*, which in this study describes size of the mutual fund. Monthly return is the capital gain each month and volatility is the standard deviation of this return. The *Sharpe ratio* (SR) is the monthly return divided by the monthly volatility. *Expense ratio* (ER) is the average cost the mutual fund company charges for administering the mutual fund. *Number of years active* (YA) is the amount of time the mutual fund has been active, measured in years. The correlation matrix showing the correlation between the different variables used in the study can be found in the appendix, table 10.

Table 3: Descriptive statistic

	Minimum	1st Quartile	Median	Mean	3rd Quartile	Maximum	Standard Deviation
Implied Flow	-0.9535	-0.0088	-0.0015	0.0155	0.0106	25.2470	0.3996
Total Net Assets (TNA) in mSEK	0.1931	887.1	2 598	5 730	6 654	65 595	8 536
<i>Natural logarithm of TNA (ln(TNA))</i>	12.17	20.60	21.68	21.49	22.62	24.91	1.6338
<i>Expense ratio (ER)</i>	0	1.263	1.500	1.455	1.677	2.985	0.5377
<i>Number of years active (YA)</i>	1	8	19	18.03	26	53	10.3134
Monthly return	-0.1618	-0.0115	0.0113	0.0099	0.0339	0.1820	0.0377
Monthly volatility	0.0002	0.0055	0.0068	0.0077	0.0086	0.0327	0.0034
<i>Sharpe ratio (SR)</i>	-18.980	-1.480	1.683	2.158	5.191	47.497	5.3384
<i>Ethical dummy</i>	0	-	0	0.1809	-	1	0.3849
<i>Eco-labelled dummy</i>	0	-	0	0.0344	-	1	0.2387
<i>Large mutual fund company dummy</i>	0	-	1	0.7056	-	1	0.4558
<i>Nordic market dummy</i>	0	-	0	0.3729	-	1	0.4836
Number of observations	10223						

4.7 Regression model

To assess the effect of the demand relation between the different types of mutual funds, panel data regression has been used. Regression is commonly used upon assessing the effect of an independent variable on a dependant variable in the field of finance. Previous studies in the field have used multiple regression in order to assess the effect of an independent variable on a dependent variable (Cashman et al. 2012; Huang et al 2007). This study models the movement in demand measured as implied flow with monthly *Sharpe ratio* (SR), *Natural logarithm of TNA* ($\ln(\text{TNA})$), *expense ratio* (ER), *number of years active* (YA), *eco-label dummy* (ELD), *ethical dummy* (ED), *large mutual fund company dummy* (LMFCD) and *Nordic market dummy* (NMD) to assess the effect of the Nordic Swan Ecolabel on demand for mutual funds. Regression is the method of choice to solve this problem. The regression model used to assess the effect of the eco-label on demand with the variables discussed in section 4.5 above, can be found below.

$$\text{Demand}_{i,t} = \beta_0 + \beta_1 * \text{SR}_{i,t} + \beta_2 * \ln(\text{TNA})_{i,t} + \beta_3 * \text{ER}_{i,t} + \beta_4 * \text{YA}_{i,t} + \beta_5 * \text{ELD}_i \\ + \beta_6 * \text{ED}_i + \beta_7 * \text{LMFCD}_i + \beta_8 * \text{NMD}_i$$

The effect of each exogenous variable has been assumed as the following: The monthly *Sharpe ratio* is assumed to be positive since it is a commonly used method in assessing financial performance (Sharpe 1966). The effect of the company's size is assumed to be positive because a large mutual fund company is believed to have a strong brand, which increases trustworthiness and recognition which should stimulate customer demand (Etilé & Teyssier 2016; Huang et al. 2007). Further, the effect of *years active* is believed to be positive, since old mutual funds have had time to develop a reputation, and *expense ratio* is believed to be negative since high costs make it more difficult to exceed these costs with returns. This is based on previous research showing negative demand effects for *expense ratio* (Cashman et al. 2012). The ethical claims dummy is believed to be positive since ethical investments have increased in demand in recent years (Bauer et al. 2007; Bauer et al. 2005; Bioy & Stuart 2020; Climent & Soriano 2011; Leite et al. 2017; Oikonomou et al. 2018) and that investing ethically seem to suggest no financial penalty which also applies for the eco-labelled mutual funds (Bauer et al. 2005; Bauer et al. 2007; Climent & Soriano 2011; Fernandez-Izquierdo & Matallin-Saez 2007; Leite et al. 2017). Finally, the effect of the eco-label is also assumed to be of a positive effect because of previous research in other markets (Bjørner et al. 2004; Jeong & Kim 2015), as well as in the mutual fund market (Bilbao-Terol et al. 2017). Further, if the effect of the label would be negative, then it would translate into the case that mutual fund managers choose to invest money and time into the acquisition of a label that would relate negatively to demand for their mutual fund. This might very well be the case, but it would be a poor business decision and therefore appropriate to highlight. The regression model does not account for whether the signal is beneficial in terms of covering the signal cost.

4.8 Reliability and Validity

Reliability is concerned with a study's ability to produce consistent results and validity regards whether a test measures what it is supposed to measure (Saunders et al 2019). To ensure

reliability and validity, this study has gone through measures described in this section. Firstly, trustworthy data has been gathered about the mutual funds used in the study, i.e the mutual funds are bound by law to report data such as NAV. Further, the data has been gathered from a trustworthy, widely used database (Thomson & Reuters Eikon) for financial data, which ensures that the data has not been manipulated by a second part. Further, it is a tool used for similar purposes in previous research (Climent & Soriano 2011; Kempf & Osthoff 2008; Leite et al. 2017; Renneboog et al. 2008), which further confirms the reliability of the source. Secondly, the sample of mutual funds consists of all actively managed equity mutual funds in Sweden. From the sample 36 out of 253 mutual funds have been removed since their reporting of NAV and TNA has been inconsistent. This has not been done on a systematic level and it is unlikely that mutual funds that are very different in terms of NAV and TNA would all have inconsistent reporting, hence the resulting sample is considered to be unbiased. To clarify, these mutual funds have been removed since the data could not be used to run the regression.

The regression model used is heavily influenced by previous research, limiting potential biases and errors in the model. The data has been stepwise checked to make sure that it fulfils the requirements for multiple regression analysis (Pallant 2007; Saunders et al. 2019). For example, the data has been checked for multicollinearity and as can be seen in the correlation matrix in the appendix no independent variables are above the $r > 0,9$ threshold (Pallant 2007). There is also not a problem of many outliers, some outliers exist but these are distributed evenly across groups limiting their impact in one group's favour. Lastly, the regression model has been tested by removing variables and running the regression to see how this affects the results. There might for example be a case where adding one variable affects the result of another variable. Further, the different types of panel data estimators have been tested to ensure a model that explains the phenomenon with regards to R-squared and F-statistics. As mentioned, a random effect model was used when in fact a fixed effect model should have been used according to the Hausman test, this might make the results less consistent.

4.9 Expert interview

To enhance the discussion of the results of the thesis, an interview has been carried out with the manager of the Nordic Swan Ecolabel's mutual fund department, Per Sandell. This interview aims to provide insights otherwise not available for the authors, such as what difficulties the mutual fund companies face upon acquiring the Nordic Swan Ecolabel. The interview was conducted 2020-05-05 and Per Sandell has given his permission to use him as a reference in this study.

The next chapter covers the results and analysis of the conducted regressions.

5 RESULTS AND ANALYSIS

This chapter is divided into two parts. The first part addresses the first research question and subsequent hypotheses. The second part addresses the second research question and subsequent hypotheses.

5.1 Ethical claims

To answer research question 1, *how do ethical claims relate to demand for mutual funds*, three hypotheses have been formulated. These were: (H1) *Ethical mutual funds experience higher demand than conventional mutual funds*, (H2) *non-labelled mutual funds experience higher demand than conventional mutual funds*, (H3) *Nordic Swan Ecolabelled mutual funds experience higher demand than conventional mutual funds*. Table 4-6 aim to test these hypotheses. For the first test, that is presented in table 4 all ethical mutual funds were compared to the conventional mutual funds and for the second test presented in table 5, the non-labelled ethical mutual funds were compared to the conventional mutual funds. For the third test illustrated in table 6, the non-labelled ethical mutual funds were ruled out upon comparing the eco-labelled funds against the conventional ones. This was done to answer the hypotheses and further to compare the interaction between the three groups in order to draw conclusions.

Upon choosing what model to use, random or fixed effects, a Hausman test was conducted. The Hausman test showed in all cases that a fixed effects model should be used. This was not possible upon answering the research questions since dummy variables are dropped in fixed effects models. Therefore, a between estimator was used, which might skew the results.

Table 4 below illustrates the regression for hypothesis 1 (H1), comparing all ethical mutual funds (group 2a and 2b) with the conventional mutual funds (group 1). As can be seen, the *ethical dummy* variable is not significant at the 95% level, hence there is no support for H1. *Natural logarithm of TNA* and *Sharpe ratio* however are significant. The *natural logarithm of TNA* is significant at the 0,0000 level with an effect of -2,77%. This means that a one percent increase in TNA relates to a 2,77% decrease in demand. The *Sharpe ratio* is significant at the 0,0029 level with an effect of 3,332%. This means that a one-unit change in *Sharpe ratio* relates to a 3,332% increase in demand. All other variables show no significance. Further, R-squared shows that approximately 21% of the variation of the independent variable is explained by the dependent variables.

Table 5 below shows the regression results for H2, comparing the non-labelled ethical mutual funds (group 2a) with the conventional mutual funds (group 1). The *ethical dummy* shows no significance in explaining flow of capital, hence there is no support for H2. In this regression *number of years active* is significant at the 0,0000 level with an effect of -0,19%. This means that a one-unit increase in *number of years active* (the fund becomes one year older) relates to a 0,19% decrease in demand. Remaining variables show no statistical significance. Further, R-squared shows that approximately 11% of the variation of the independent variable is explained by the dependent variables.

Table 4: Random effect result for hypothesis 1

Analysis of whether ethical mutual funds (group 2a and 2b together) experience higher demand than conventional mutual funds (group 1).

	Estimate		Std. Error	t-value	p-value
<i>(Intercept)</i>	0.5354	***	0.1139	4.7009	0.0000
<i>Sharpe ratio</i>	0.0332	**	0.0110	3.0186	0.0029
<i>Natural logarithm of TNA</i>	-0.0277	***	0.0055	-5.0492	0.0000
<i>Expense ratio</i>	0.0050		0.0136	0.3625	0.7173
<i>Number of years active</i>	-0.0002		0.0008	-0.3079	0.7585
<i>Ethical dummy</i>	0.0323		0.0192	1.6855	0.0934
<i>Large mutual fund company dummy</i>	0.0012		0.0184	0.0649	0.9483
<i>Nordic market dummy</i>	-0.0077		0.0146	-0.5253	0.5999
Total Sum of Squares	2.6406				
Residual Sum of Squares	2.0756				
R-Squared	0.2140				
Adjusted R-Squared	0.1876				
F-statistic: 8.1272 on 7 and 209 DF, p-value: 0.0000					
Number of observations	10223				

Significant level at $0.001 > = (***)$, $0.01 = (**)$ and $0.05 = (*)$

Table 5: Random effect result for hypothesis 2

Analysis of whether non-labelled ethical mutual funds (group 2a) experience higher demand than conventional mutual funds (group 1).

	Estimate		Std. Error	t-value	p-value
<i>Intercept</i>	-0.0266		0.0856	-0.3101	0.7568
<i>Sharpe ratio</i>	0.0078		0.0067	1.1597	0.2475
<i>Natural logarithm of TNA</i>	0.0033		0.0038	0.8687	0.3860
<i>Expense-ratio</i>	-0.0060		0.0094	-0.6319	0.5281
<i>Number of years active</i>	-0.0019	***	0.0004	-4.4716	0.0000
<i>Ethical dummy</i>	0.0163		0.0126	1.2942	0.1970
<i>Large mutual fund company dummy</i>	-0.0105		0.0118	-0.8844	0.3775
<i>Nordic market dummy</i>	0.0003		0.0089	0.0322	0.9744
Total sum of squares	0.8818				
Residual sum of squares	0.7815				
R-Squared	0.1137				
Adjusted R-Squared	0.0837				
F-statistic: 3.7940 on 7 and 207 DF, p-value: 0.0007					
Number of observations	9872				

Significant level at $0.001 > = (***)$, $0.01 = (**)$ and $0.05 = (*)$

Table 6 below shows the regression results for H3 comparing the eco-labelled mutual funds (group 2b) with the conventional mutual funds (group 1). The *eco-labelled dummy* is significant at the 0,0040 level with an effect of 8,78%. This means that an eco-labelled mutual fund experiences 8,78% more demand (as determined by flow of capital) on average than a conventional mutual fund, hence there is support for H3. The *natural logarithm of TNA* is significant at the 0,0000 level with an effect of -2,71%. This means that a one percent increase in TNA gives rise to a 2,71% decrease in demand. The *Sharpe ratio* is significant at the 0,0024 level with an effect of 3,378%. This means that a one-unit change in *Sharpe ratio* relates to a 3,378% increase in demand. The other variables show no statistical significance. Further, R-squared shows that approximately 24% of the variation of the independent variable is explained by the dependent variables.

Table 6: Random effect result for hypothesis 3

Analysis of whether eco-labelled ethical mutual funds (group 2b) experience higher demand than conventional mutual funds (group 1).

	Estimate		Std. Error	t-value	p-value
<i>Intercept</i>	0.5311	***	0.1269	4.1838	0.0000
<i>Sharpe ratio</i>	0.0378	**	0.0123	3.0787	0.0024
<i>Natural logarithm of TNA</i>	-0.0271	***	0.0062	-4.3969	0.0000
<i>Expense-ratio</i>	0.0010		0.0155	0.0677	0.9461
<i>Number of years active</i>	-0.0001		0.0009	-0.1384	0.8901
<i>Eco-labelled dummy</i>	0.0878	**	0.0301	2.9175	0.0040
<i>Large mutual fund company dummy</i>	-0.0172		0.0220	-0.7833	0.4345
<i>Nordic market dummy</i>	-0.0158		0.0169	-0.9346	0.3513
Total sum of squares	2.5699				
Residual sum of squares	1.9546				
R-Squared	0.2394				
Adjusted R-Squared	0.2093				
F-statistic: 7.9601 on 7 and 177 DF, p-value: 0.0000					
Number of observations	8458				

*Significant level at 0.001 > = (***) , 0.01 = (**) and 0.05 = (*)*

To summarize the results for research question 1, *how do ethical claims relate to mutual fund demand*, this study found support for H3 but not for H1 and H2. This means that Nordic Swan Ecolabelled mutual funds (group 2b) tend to experience higher demand than conventional mutual funds (group 1). However, non-labelled mutual funds (group 2a) could not be shown to experience different demand compared to the conventional mutual funds (group 1), neither did the ethical mutual funds (group 2a and group 2b). Hence, the answer to research question 1 is that ethical claims show no relation to demand in this study. However, more rigorous ethical claims communicated by the Nordic Swan Ecolabel show a positive relation to demand.

5.2 Eco-labels

To answer research question 2, *how do eco-labels, in this case, the Nordic Swan Ecolabel relate to demand for ethical mutual funds*, two hypotheses were formulated. These were: (H4) *Nordic Swan Ecolabelled mutual funds experience higher demand than non-labelled mutual funds*, (H5) *Nordic Swan Ecolabelled mutual funds experience increased demand after acquiring the label*. Table 7 and 8 aim to test these hypotheses. The first test, illustrated in table 7 shows the regression results between eco-labelled and non-labelled ethical mutual funds. The second test illustrated in table 8 shows the regression results upon comparing the eco-labelled mutual funds amongst themselves. Therefore, to answer hypothesis 5 a fixed effects model is used since the comparison is made within the group and that the eco-label dummy is not dropped.

Table 7 below shows the regression results for H4, comparing the eco-labelled mutual funds (group 2b) with the non-labelled ethical mutual funds (group 2a). The *eco-labelled dummy* is significant at the 0,0039 level with an effect of 28,06%. This means that an eco-labelled mutual fund experiences 28,06% more demand (as determined by flow of capital) on average than a non-labelled ethical mutual fund, hence there is support for H4. *Number of years active* is significant at the 0,0435 level and has an effect of -0,56%. This means that a one-unit increase in *number of years active* (the fund becomes one year older) relates to a 0,56% decrease in demand. Remaining variables show no statistical significance. Further, R-squared shows that approximately 39% of the variation of the independent variable is explained by the dependent variables.

Table 7: Random effect result for hypothesis 4

Analysis of whether Nordic Swan Ecolabelled mutual funds (group 2b) experience higher demand than non-labelled ethical mutual funds (group 2a).

	Estimate		Std. Error	t-value	p-value
<i>Intercept</i>	0.2847		0.5918	0.4811	0.6332
<i>Sharpe ratio</i>	0.0867		0.0448	1.9369	0.0602
<i>Natural logarithm of TNA</i>	-0.0117		0.0268	-0.4364	0.6650
<i>Expense ratio</i>	-0.1129		0.0741	-1.5242	0.1357
<i>Number of years active</i>	-0.0056	*	0.0027	-2.0882	0.0435
<i>Eco-labelled dummy</i>	0.2806	**	0.0913	3.0707	0.0039
<i>Large mutual fund company dummy</i>	0.0206		0.0770	0.2644	0.7929
<i>Nordic market dummy</i>	-0.0143		0.0550	-0.2596	0.7966
Total Sum of Squares	1.8505				
Residual Sum of Squares	1.1267				
R-Squared	0.3911				
Adjusted R-Squared	0.2790				
F-statistic: 3.4871 on 7 and 38 DF, p-value: 0.0055					
Number of observations	2117				

*Significant level at 0.001 > = (***) , 0.01 = (**) and 0.05 = (*)*

Table 8 below shows the regression results for H5, estimating the regression coefficients for the Nordic Swan Ecolabelled mutual funds (group 2b) by themselves. Since a comparison within the group is made, a fixed effects model is used coherently with the Hausman test. Therefore, static variables are dropped and not shown in the table. The *eco-labelled dummy* shows no significance in explaining flow of capital, hence there is no support for H5. The *natural logarithm of TNA* is significant at the 0,0000 level with an effect of -50,77%. This means that a one percent increase in TNA relates to a 50% decrease in demand. Further, R-squared shows that approximately 4,88% of the variation of the independent variable is explained by the dependent variables, which is substantially lower than previous regressions.

Table 8: Fixed effect result for hypothesis 5

Analysis of whether eco-labelled ethical mutual funds (group 2b) experience higher demand after acquiring the Nordic Swan Ecolabel.

	Estimate		Std. Error	t-value	p-value
<i>Sharpe ratio</i>	0.0014		0.0078	0.1826	0.8552
<i>Natural logarithm of TNA</i>	-0.5077	***	0.0934	-5.4367	0.0000
<i>Number of years active</i>	0.0093		0.0698	0.1332	0.8941
<i>Eco-labelled dummy</i>	0.1695		0.1558	1.0878	0.2771
Total sum of squares	623.96				
Residual sum of squares	593.54				
R-Squared	0.0488				
Adjusted R-Squared	0.0219				
F-statistic: 7.7139 on 4 and 602 DF, p-value: 0.000					
Number of observations	620				

*Significant level at 0.001 > = (***) , 0.01 = (**) and 0.05 = (*)*

To summarize the results for research question 2, *how do eco-labels, in this case the Nordic Swan Ecolabel relate to demand for ethical mutual funds*, this study found support for H4 but not for H5. This means that eco-labelled mutual funds (group 2b) experience higher demand than non-labelled ethical mutual funds (group 2a). However, since no significance was found for the within test this study cannot show that the eco-labelled mutual funds (group 2b) experienced increased demand after acquiring the Nordic Swan Ecolabel. Hence, the answer to research question 2 is that the Nordic Swan Ecolabel show positive relation to demand for ethical mutual funds in this study. However, the study could not show that eco-labelled mutual funds experienced increased demand after acquiring the Nordic Swan Ecolabel meaning that no causality could be inferred.

6 DISCUSSION

This section discusses the results in accordance with the research questions followed by a discussion of the implications for mutual fund managers.

6.1 General discussion

Hypothesis 1 (H1) stating that ethical mutual funds (including both non-labelled ethical and eco-labelled ethical mutual funds) experience higher demand than conventional mutual funds and H2, stating that non-labelled ethical mutual funds experience higher demand than conventional mutual funds are not supported in the study. H3, stating that eco-labelled mutual funds experience higher demand than conventional mutual funds and H4, stating that eco-labelled mutual funds experience higher demand than non-labelled ethical mutual funds are supported by the results of the study. Further, H5 stating that mutual funds experience increased demand after acquiring the Nordic Swan Ecolabel is not supported.

As seen in the tables from the results, the R-squared values vary from 5-30% which might be considered low but previous research modelling inflow of capital into mutual funds show similar R-squared values (Cashman et al. 2012; Cooper et al. 2005), adding to the credibility of this study. Further, the F-statistic was significant in all regressions implicating that the model used was a good fit to the data. When conducting the robustness check the F-statistic significance level was improved as more variables were added to the regression model. Upon conducting the robustness check, the variables remained similar with regards to effect and significance level, which further cements that there was no multi-collinearity between the variables. Hence, the results of the study suggest that Nordic Swan Ecolabelled mutual funds experience higher demand than non-labelled ethical and conventional mutual funds. Further, the study found no significant difference in demand between non-labelled ethical mutual funds and conventional mutual funds and further within the eco-labelled mutual fund group.

The answer to research question 1, is that ethical claims communicated by non-labelled ethical mutual funds show no relation to demand for mutual funds according to this study. Ethical claims communicated by the Nordic Swan Ecolabel however show positive relation to demand. Therefore, this study cannot show that it is enough to signal commitment to ethics and sustainability through ethical claims communicated by the mutual funds themselves, this is discussed in-depth further down in this section.

The answer to research question 2, is that the Nordic Swan Ecolabel show a positive relation to demand for ethical mutual funds in this study. However, no causality can be shown, since the study cannot show that eco-labelled mutual funds experience higher demand after acquiring the Nordic Swan Ecolabel. Therefore, this study cannot show that the Nordic Swan Ecolabel causes demand to rise, however, it can show that Nordic Swan Ecolabelled mutual funds on average have a higher demand than non-labelled ethical mutual funds. This is discussed in-depth further down in this section.

6.1.1 Discussion of variables

Natural logarithm of TNA is significant in all regressions but the regression regarding H2 and H4 and has a slightly negative effect in all but the regression for H5. This might be thought of as somewhat contradictory as large mutual funds should enjoy more inflow of capital. However, other studies have shown similar results, with a slightly negative effect for the *natural logarithm of TNA* (Cashman et al. 2012) and perhaps it's not surprising that as mutual funds grow and become larger, they become mature and investors turn to other products. Table 8 in section 5.2 shows that the *natural logarithm of TNA* has an effect of -50%, meaning that a one percent increase in TNA gives rise to a 50% decrease in implied flow (demand). This result is unreasonable and not trustworthy since a mutual fund would rapidly lose investors upon growing the mutual fund and this is also not supported by previous research (Cashman et al. 2012). This troublesome result is believed to be because of a lack of observations (only 620 data points).

The *Sharpe ratio* is significant in the regressions relating to hypotheses 1 and 3. It is close to being significant in the regression relating to hypothesis 4 where it shows significance at the 0,06 level. While this does not hold up to the 0,05 threshold it's still close. In the other regressions, no significance can be shown. In the regressions that the *Sharpe ratio* is significant and in the one it is close to being significant, the effect is slightly positive. Indicating that a high *Sharpe ratio* is positive for demand in mutual funds, which is in line with previous research about performance and its effect on demand for mutual funds (Cashman et al. 2012). This result is not surprising as high returns with low standard deviation are preferred to low returns with high standard deviation. That is, no investor would take on more risk for less expected return.

Number of years active is significant in the regressions for H2 and H4, when comparing non-labelled ethical mutual funds (group 2a) with the conventional (group 1) and eco-labelled (group 2b) mutual funds respectively. In these regressions it's effect is slightly negative, indicating that ethical mutual funds might benefit from being new and therefore not associated with older, less sustainable products. Previous research has shown similar results (Huang et al. 2007). The result might also be an indication of newcomer bias since many of the non-labelled mutual funds tend to be younger than the other groups. Perhaps it is not surprising that new mutual funds on the market attract more capital initially, especially given the results regarding the *natural logarithm of TNA*.

The *expense ratio* is not significant in any of the regressions. This is believed to be because of the similarities in *expense ratio* among the mutual funds since previous research shows that a high *expense ratio* relates to a lower inflow of capital (Cashman et al. 2012). For example, if index mutual funds were to be included in the study, cheap and expensive products would be compared to each other, not only expensive products as is the case in this study. As mentioned before index mutual funds have not been included as it potentially could skew the results because of the small number of Nordic Swan Ecolabelled index mutual funds, that are not included in this study.

Large mutual fund company and the *Nordic market dummy* show no significance in any of the regressions. The large mutual fund company was supposed to capture investors' familiarity with well-known mutual fund companies (Huang et al. 2007). The Nordic market dummy was

supposed to capture possible equity home bias (French & Poterba 1991). No such effects could be shown, indicating that the sample was not exposed to either familiarity issues nor equity home bias.

6.1.2 Discussion of findings

It was believed to be the case that the group ethical mutual funds (group 2a and 2b) should have positive demand relation compared to the conventional mutual funds (group 1) due to the increased demand of ethical investing products (Bauer et al. 2007; Bauer et al. 2005; Bioy & Stuart 2020; Climent & Soriano 2011; Leite et al. 2017; Oikonomou et al. 2018) but this study cannot show that this is the case. This is probably because the non-labelled ethical mutual funds (group 2a) for which the study cannot find a demand effect, are a large part of the group ethical mutual funds. In conjunction with the fact that the eco-labelled funds (group 2b) for which the study can find significant demand effects are a small part of the group ethical mutual funds (group 2a and 2b). This can be seen when comparing the regression tables 5 and 6, where nothing can be said about the non-labelled ethical mutual funds (group 2a) relation to demand while eco-labelled mutual funds (group 2b) clearly relates to a higher demand.

The question then becomes why can't this study show a significant difference between the non-labelled and the conventional mutual funds? First of all, it might be the case that there is no difference, but this explanation is perhaps not correct since the literature point to increases in demand for ethical investing products (Bauer et al. 2007; Bauer et al. 2005; Bioy & Stuart 2020; Climent & Soriano 2011; Leite et al. 2017; Oikonomou et al. 2018). More likely is that this study fails to capture some non-labelled ethical mutual funds or that the ones captured have just changed their investment profile and thus are categorized as non-labelled ethical funds when in fact they are not for most of the time period. Perhaps the most appealing explanation, coherent with the fact that the eco-labelled mutual funds relate to significantly higher demand, is that investors simply do not believe a mutual fund's ethical claims if it is not certified by a third-party.

The *eco-label dummy* is significant in all the regressions it is part of, see table 6 and 7, except when running the regression within the eco-labelled group (group 2b), see table 8. Further, the effect of the variable is large, varying from 8-28%. This means that on average, a mutual fund having the Nordic Swan Ecolabel has an increased demand of 8-28%. This result is in line with signalling theory (Spence 1973) suggesting that the Nordic Swan Ecolabel sends a signal of quality, in terms of ethical claims for ethical mutual funds. Hence, the signal helps investors when determining which ethical mutual funds to invest in, by reducing information asymmetry (Akerlof 1970; Spence 1973). Further, leading to a reduced screening cost (Stiglitz 1975b) for investors when assessing the mutual funds' ethical claims. The main argument for this is that the Nordic Swan Ecolabel definition of an ethical mutual fund gives investors more insight regarding the underlying assets for eco-labelled mutual funds (Bauer et al. 2007). Investors don't have to scrutinize the underlying assets (Stiglitz 1975b), someone else does this for them, which reduces screening costs, ensuring compliance with the marketed standards for ethical investing, subsequently reducing asymmetric information (Akerlof 1970). This suggests that investors will deem mutual funds with the Nordic Swan Ecolabel as high-quality products on the market (Auriol & Schilizzi 2015; Etilé & Teyssier 2016).

Since no significant effect can be found upon running the regression within the eco-labelled mutual fund group this study cannot infer causality between the Nordic Swan Ecolabel and increased demand. It might be the case that the eco-labelled mutual funds were deemed high-quality products before acquiring the Nordic Swan Ecolabel. That is, investors might have trusted these mutual funds ethical claims before they acquired the eco-label and thus invested more capital in them. However, since the regression within the eco-labelled mutual fund group only has 620 data points it might be the case that more data is needed to show that mutual funds that acquire the Nordic Swan Ecolabel experience higher demand as a result of the signal the eco-label sends to investors. The within regression for hypothesis 5, show troublesome results for the *natural logarithm of TNA* with an effect of -50% per percentage change in TNA gives support for this notion.

The results that the Nordic Swan Ecolabelled mutual funds relate to higher demand than conventional mutual funds are in line with previous studies about eco-labelled mutual funds in other countries (Bilbao-Terol et al. 2017) and further with the bulk of research that has been done in other lines of businesses (Bjørner et al 2004; Jeong & Kim 2015). However, this study has shown that eco-labelled mutual funds (group 2b) have a positive demand relation compared to both conventional (group 1) and non-labelled mutual funds (group 2a), not just conventional mutual funds like in previous research (Bilbao-Terol et al. 2017). Given the fact that ethical investments are ambiguous in their investment profile, that mutual fund companies vary in their effort of advertising and further the difficulty of categorising these mutual funds, the results of the study might be somewhat skewed. One might say that this study has not captured all ethical mutual funds or that it has captured too many. If this was the case, it is believed that the non-labelled ethical mutual funds would show some effect on the flow of capital into these funds, this is not the case. Further, the problem of ambiguity in ethical mutual funds is widely discussed in the literature (Kempf & Osthoff 2008; Utz & Wimmer 2014; Wimmer 2013) and one of the main reasons a third-party certification is perceived to be needed (Bauer et al. 2007). That is, if the widespread opinion of investors is that non-labelled ethical mutual funds are in fact not ethical, coherent with some of the literature (Utz & Wimmer 2014) and a potential diminished trust in mutual fund companies. Investors might be drawn to eco-labelled investments because of the continuous scrutiny of the assets in these mutual funds and the potential trust investors have for the third-party organisations that administer eco-labels such as the Nordic Swan Ecolabel.

The results are also in line with what is to be expected due to the increasing popularity of ethical investing and CSR (Bauer et al. 2007; Bauer et al. 2005; Bioy & Stuart 2020; Climent & Soriano 2011; Leite et al. 2017; Oikonomou et al. 2018). The results support the claim that ethical investing is a growing phenomenon and further that investors might be sceptical when it comes to claims about ethical and sustainable investing. This is illustrated by the lack of results supporting non-labelled ethical mutual funds (group 2a) having a higher demand than conventional mutual funds (group 1). That is, this study cannot show that it is enough to signal commitment to ethical and sustainable investing through ethical claims. This study's results differ from some of the previous research findings (Etilé & Teyssier 2016) which could not find any difference in signalling effects between brands and certifications. However, as mentioned before the result goes hand in hand with research on eco-labels that have illustrated demand

increase for eco-labelled products (Bilbao-Terol et al. 2017; Bjørner et al. 2004; Jeong & Kim 2015). Unlike Etilé & Teyssier (2016) findings, the Nordic Swan Ecolabel seems to be able to communicate quality (with regards to ethical commitment) clearly to customers according to this study in line with previous research on eco-labelled mutual funds (Bilbao-Terol et al. 2017). One explanation might be like previously mentioned, that investors don't think that ethical mutual funds actually invest in more ethical assets (Utz & Wimmer 2014). It can also be a trust-related issue connected to recent events in the banking world that might have led to diminished trust for banks and mutual fund companies (Olsson, Fock, Juhlin & Klintevall 2019; Larsson 2019). Hence, the study finds no evidence of mutual funds being able to signal their commitment to ethical and sustainable investing without the use of an eco-label, suggesting that for mutual funds the Nordic Swan Ecolabel acts as a signal of quality (Akerlof 1970; Auriol & Schilizzi 2015; Spence 2002) and further reduces the information asymmetry between investors and mutual fund managers.

The body of literature on the performance of ethical mutual funds (Bauer et al. 2005; Bauer et al. 2007; Climent & Soriano 2011; Fernandez-Izquierdo & Matallin-Saez 2007; Halbritter & Dorfleitner 2015; Leite et al. 2017) and the possible reduction of risk associated with incorporating aspects such as ESG in investing (Climent & Soriano 2011; Renneboog et al. 2008) seems to appeal investors according to this study. The *Sharpe ratio* has a positive effect on the demand, but it is not as prevalent as the effect of the Nordic Swan Ecolabel. This might mean that investors think it is more important to invest ethically than to enjoy high risk-adjusted returns. It might also mean that investors, in line with the growing body of literature on the subject do not see ethical investing as something that experiences lower returns (Bauer et al. 2005; Bauer et al. 2007; Climent & Soriano 2011; Fernandez-Izquierdo & Matallin-Saez 2007; Halbritter & Dorfleitner 2015; Leite et al. 2017). On the contrary, in line with Robért et al. (2012) they might view ethics and sustainability as being difficult to price and therefore a risk not fully incorporated in the *Sharpe ratio* and other performance measures (Renneboog et al. 2008).

So, why are there not more Nordic Swan Ecolabelled mutual funds? It seems peculiar that there are only 14 eco-labelled equity mutual funds in Sweden, given that this study shows a positive relation between demand and Nordic Swan Ecolabelled mutual funds and that previous research points to increased demand for eco-labelled mutual funds (Bilbao-Terol et al. 2017). In an interview² with Per Sandell (2020) who manages the Nordic Swan Ecolabel for mutual funds, acquiring the eco-label might be a difficult transition for mutual funds. The acquisition might, therefore, be expensive, making the cost of the signal high, possibly outweighing the profit of the acquisition in line with Spence's claims (1973, 2002). Not only do mutual funds have to live up to the Nordic Swan Ecolabel's rigorous criteria, but in many cases, they must also set up systematic processes and routines, which is a requirement to be eligible for the

² The interview was conducted online 2020-05-05 with Per Sandell who manages the Nordic Swan Ecolabel for mutual funds, in order to get the Nordic Swan Ecolabel's input on the research. The purpose of the interview was to get an understanding of how the Nordic Swan Ecolabel works with the eco-label, to better analyse and discuss the results of the study.

Nordic Swan Ecolabel. It could be that mutual fund companies find it difficult to set up these processes, thus leading to a small increase in mutual funds certified with the Nordic Swan Ecolabel (Sandell 2020).

However, mutual fund managers that have adapted, often praise this process of working since it gives robustness to the ESG related processes which result in enhanced management of the mutual funds (Sandell 2020). This aligns with findings in previous research showing that rigorous screening activities help mutual fund managers pick winning stocks and better manage their mutual funds (Renneboog et al. 2008). The Nordic Swan Ecolabel constructs their criteria to sort the best mutual funds when it comes to ethics and sustainability. If the criteria are too difficult to fulfil, no mutual funds will be eligible for the eco-label. On the contrary, if the criteria are too easy to fulfil, every mutual fund will be eligible and the Nordic Swan Ecolabel's brand will be watered down. Finding the balance between these two extremities is the difficult part and whether the label is in balance with 14 actively managed equity mutual funds is difficult to say. So keeping the rigorous requirements is a conscious strategy in order to keep the signal the eco-label is sending of high-quality and not water down the Nordic Swan Ecolabel brand (Sandell 2020). The Nordic Swan Ecolabel has continuous contact with the large mutual fund companies in Sweden, often working together with them in order to guide these mutual fund companies in their pursuit of acquiring the Nordic Swan Ecolabel (Sandell 2020).

6.2 Implications for mutual fund managers

The results of this study suggest that investors seek out ethical investments and that they do so by looking for the Nordic Swan Ecolabel. Since many investors, especially private ones lack the time and necessary competency in order to evaluate mutual fund's ethical claims and further because of a potential diminished trust problem in light of recent scandals (Olsson et al. 2019; Larsson 2019), the Nordic Swan Ecolabel seems to bridge this gap between mutual fund companies and investors. This suggests that investors see mutual funds with the Nordic Swan Ecolabel as a high-quality product (Auriol & Schilizzi 2003) which strengthens trustworthiness (Grossman 1981; Shapiro 1982; Etilé & Teyssier 2016) of the mutual funds' ethical claims. Investors seem to, in some sense experience a reduced screening cost (Stiglitz 1975a) when investing in mutual funds who have acquired the Nordic Swan Ecolabel, hence the positive demand relation for eco-labelled mutual funds (group 2b) compared to the other groups. This supports the argument that the Nordic Swan Ecolabel acts as a signal (Spence 1973, 2002) to strengthen ethical claims for mutual fund companies. Further, the Nordic Swan Ecolabel reduces asymmetric information between investors and mutual fund managers since the eco-label scrutinizes the mutual funds underlying assets. In this sense, the Nordic Swan Ecolabel acts as a standardised definition of ethical mutual funds for investors to use when screening for new ethical mutual funds to invest in. This means that investors demand eco-labels in order to minimize information asymmetry just like many other studies before have pointed to (Bilbao-Terol et al. 2017; Jeong & Kim 2015; Bjørner et al 2004).

The results suggest that mutual fund companies that aim to introduce mutual funds that are truly ethical or sustainable, should acquire the Nordic Swan Ecolabel. This decision though is based on many different questions that each mutual fund company must ask themselves. There

might for example be other reasons than customer demand that has determined whether mutual fund companies should pursue certification or not. Such reasons might be that a certain mutual fund company does not have the proper resources in terms of skilled employees within the field to live up to the rigorous requirements of the Nordic Swan Ecolabel. Other reasons might be that their ethical claims are false or that they believe that they can signal ethical claims through a strong brand. However, this study shows no effect of having a large established brand on customer demand in percentages, neither does it show that non-labelled mutual funds can signal their commitment to ethical investing through ethical claims. Therefore, each mutual fund company must make their judgement based on their individual ability to live up the standards of the Nordic Swan Ecolabel and to what cost, upon deciding whether to acquire the Nordic Swan Ecolabel.

In order to utilize the sustainability trend in investment mutual funds managers should take the following aspects into consideration. Firstly, managers of well-established mutual funds (with large TNA and many years active) seem to have less to gain from acquiring the Nordic Swan Ecolabel. To reap the highest possible demand increase, managers should launch a new mutual fund with a well-defined sustainability strategy. Upon launch, the mutual fund managers should apply for the Nordic Swan Ecolabel as soon as possible, since the results in the study suggest that this variable has the highest effect on demand. Further, the eco-labelled effect is greater than both *number of years active* and the *natural logarithm of TNA* together, which suggest that if the established mutual fund already is pursuing an ethical investment strategy, managers should apply for the Nordic Swan Ecolabel, even though they seem to have less to gain than new mutual funds. Lastly, another aspect to consider for mutual fund managers is the *Sharpe ratio*, which is an important factor in determining demand as shown by this study. The *Sharpe ratio* does not seem to be negatively affected by investing ethically as discussed, further supporting the suggested acquisition of the Nordic Swan Ecolabel.

7 CONCLUSION

This section is divided into three different parts. The first part presents the findings of the study in relation to the research questions. The second part covers the limitations of the thesis. The third and final part of the conclusion addresses suggestions for future work.

The purpose of this study has been to investigate how ethical claims and eco-labels relate to the demand for mutual funds. Therefore, this study has aimed to answer the research questions: *How do ethical claims relate to demand for mutual funds and how do eco-labels, in this case, the Nordic Swan Ecolabel relate to demand for ethical mutual funds.* These questions were formulated in order to investigate if the eco-label sends a signal of quality (in terms of commitment to ethics and sustainability) relating to increasing demand from investors seeking to invest in ethical financial products.

In order to answer these questions, the necessary data for each of the 217 equity mutual funds were collected from Thomson & Reuters database Eikon. These mutual funds were categorized into the groups: conventional (group 1), non-labelled ethical (group 2a), and eco-labelled (group 2b) mutual funds based on their characteristics.

The data was structured as panel data and a random effect model was used for the first four hypotheses and a fixed effect model was used for the last hypothesis to estimate the regression. This was done to model the demand with explanatory variables such as *Sharpe ratio*, *Natural logarithm of TNA*, *number of years active*, *expense ratio*, and several dummy variables to account for different group characteristics in the sample.

The results of the study support previous research in other countries (Bilbao-Terol et al. 2017) and in other industries (Bjørner et al. 2004; Jeong & Kim 2015), that eco-labelled mutual funds have a positive relation to demand compared to their conventional counterparts. Furthermore, the study also found that eco-labelled mutual funds have a positive demand relation compared to non-labelled ethical mutual funds, which to the authors' knowledge has not been shown before.

However, the study did not find support for demand increases within the eco-labelled group after labelling a mutual fund with the Nordic Swan Ecolabel, which might be due to a lack of observations. It might also be the case that the eco-labelled mutual funds were of high-quality in terms of signalling their ethical commitment to increase demand even before acquiring the Nordic Swan Ecolabel. Therefore, this study cannot say that the Nordic Swan Ecolabel causes demand to increase due to a stronger signal. However, it can say eco-labelled mutual funds experience higher demand compared to non-labelled ethical mutual funds and conventional mutual funds.

This study can say that there is a signal that Nordic Swan Ecolabelled mutual funds are sending which reduces screening costs, which relates to increasing demand for these mutual funds. In other words, the Nordic Swan Ecolabelled group distinguishes itself from the other mutual fund groups. Hence, the results implicate that mutual fund companies that aim to introduce mutual funds that are truly ethical or sustainable should consider acquiring the Nordic Swan Ecolabel to signal their sustainability commitment since the results suggest that eco-

labelled mutual funds have a positive relation to demand, both when compared to conventional mutual funds and non-labelled ethical mutual funds.

7.1 Limitations

This study did not investigate the signalling costs of the Nordic Swan Ecolabel, it investigated if the eco-label sends a signal that relates positively to the demand of these mutual funds. The results show that there is an effect of the Nordic Swan Ecolabel and subsequently that the eco-label is sending a signal that relates positively to demand for the product. However, since this study did not cover the cost of sending this signal it is uncertain whether the benefits outweigh the costs (Auriol & Schilizzi 2003; Etilé & Teyssier 2016; Spence 1973). As Spence (1973) suggests, a deliverer of a signal will only pursue the signalling if it is believed that the outcome from doing so will be higher than the cost. Further, Spence (1973) and Shapiro (1982) argue that newcomers will evaluate the signalling cost joint with observations from previous time-periods of other firms. Since the launch date of the Nordic Swan Ecolabel, there have only been a few new mutual funds that have acquired the certification. Hence, there might be a case that the benefit in increased demand does not cover the signalling cost (Shapiro 1982) of acquiring the Nordic Swan Ecolabel which is shown by the small increase of Nordic Swan Ecolabelled mutual funds, just as Spence (1973, 2002) argue. Leaving the cost-performance out, the results from the study showed that the Nordic Swan Ecolabelled mutual funds related positively to demand compared to the other groups of mutual funds.

One limitation of this study was that it could not show that the Nordic Swan Ecolabel caused higher demand, it could however show a relation between the eco-label and demand. If hypothesis 5 had been accepted, the results would suggest causality between increasing demand and the acquiring of the Nordic Swan Ecolabel. The effect of the Nordic Swan Ecolabel in modelling demand showed a higher demand for the eco-labelled mutual funds. Therefore, it is believed that the reason as to why hypothesis 5 could not be accepted was due to a lack of observations.

Some of the hypotheses tested in this study used a random effect model to estimate the regression coefficients. This might have skewed the results as the Hausman test indicated that a fixed model should be used. This was probably due to correlation between regressors and error terms which is to be expected upon modelling a complex issue like demand for mutual funds. However, some of the tests in this study could not use a fixed effect model as it dropped the dummy variables upon which the results of the study relied. This might have resulted in the model being less consistent and that the study might be difficult to replicate (Greene 2002).

Further, this study used *Sharpe ratio* to capture mutual funds' performance in the regression model. Previous studies often use a Fama-French factor model to describe the performance of financial assets since it captures market capitalization and book-to-market ratio (Cashman et al. 2012; Climent & Soriano 2011; Leite et al. 2017). The model can be expanded using more factors such as momentum giving even more insight into a mutual fund's performance. This study has not used the Fama-French factor model since the necessary data needed to calculate each factor has not been accessible from a reliable source.

The way in which this study measured demand, implied flow, can be improved upon if the data can be gathered successfully. The way this study measured demand assumes that all demand arises at one point every month. In reality, this is not the case, and therefore more accurate mathematical models to estimate regressors' impact on demand could be found if more accurate data on when demand arises could be gathered. A method using the net cash flow³ model would give more accurate estimations according to demand (de Mingo-López & Matallín-Sáez 2017). However, the method could not be used because the needed data were not accessible.

Another limitation of the study was the survivorship bias (Huang et al. 2007) the data sample experienced. All mutual funds in the study are active during the entire time-period. Hence, no dropouts could be found, so the results might differ if dropouts could be accounted for.

7.2 Future work

Future work on analysing demand for eco-labelled mutual funds and how mutual funds relate to each other in terms of demand should take note of the shortcomings of this study. An important next step is to integrate signal costs of labelling a mutual fund with the Nordic Swan Ecolabel, to evaluate if the benefits outweigh the signalling costs. Bridging this gap could perhaps shine a light on why there are not more Nordic Swan Ecolabelled mutual funds. Replicating this study some time from now might also be beneficial in order to establish demand differences upon acquiring the Nordic Swan Ecolabel, which this study failed to show as it suffered from a lack of observations.

This study could not show causality between the Nordic Swan Ecolabel and increased demand. With more observations in the regression for hypothesis 5, it is believed that inferences about causality could be drawn. Therefore, future research should investigate this hypothesis when more data is available.

Further, analysing and adding more variables as to mitigate omitted variable bias could make the results more consistent, making results less difficult to replicate.

Similar studies like this one could be done on other mutual fund markets, not only the Swedish market like this study has investigated. Similar eco-labels in other countries might not have the same effect as the Nordic Swan Ecolabel, which has been around for a long time, which might have enabled it to establish trust during a long time. Other markets and countries might also have differing views on ethical and sustainable investing, not giving rise to similar demand effects from these labels.

³ Net cash flow uses total inflow of capital subtracted by total redemptions from investors during each month. This is divided by TNA for the previous month in order to obtain net cash flow for one fund in each month. This approach measures actual net cash flow and thus does not assume cash flows at one point in every month.

Bridging these gaps would make it easier for mutual fund companies to provide attractive products to its customers and further would perhaps make sustainable investing even more widespread than it is now. Sustainable investing can play a big role in society's journey towards a sustainable future but on that journey, customers must be able to make informed choices. Widening the knowledge on eco-labels for mutual funds is therefore one piece of the puzzle in solving the issues facing society.

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APPENDIX

Table 9: Appendix, list of mutual funds

Illustrates the list of all 217 equity mutual funds used in the study. The table include the mutual funds names, Lipper ID, size in terms of total net asset (TNA) in million SEK. Further, the list includes whether the mutual funds deem themselves ethical and if they have acquired the Nordic Swan Ecolabel.

Fund Name	Lipper ID	TNA(mSEK)	Ethical dummy	Eco-labelled dummy
AGCM Fund Asia Growth Sub-Fund RC SEK Cap	LP68301680	562	0	0
AGCM Fund China Stars RC8 SEK Cap	LP68450372	46	0	0
AMF Aktiefond Asien Stilla havet	LP65150100	1 305	0	0
AMF Aktiefond Europa	LP60048447	5 611	0	0
AMF Aktiefond Global	LP60069297	17 424	0	0
AMF Aktiefond Nordamerika	LP65090712	2 826	0	0
AMF Aktiefond Smabolag	LP65010737	9 803	0	0
AMF Aktiefond Sverige	LP60048438	33 846	0	0
AMF Aktiefond Varlden	LP60048435	39 160	0	0
Aktie-Ansvar Europa	LP60049235	34	0	0
Aktie-Ansvar Sverige A	LP60047475	1 598	0	0
CF Ryssland A	LP60048170	1 155	0	0
CF Tillvaxt Sverige A	LP68352918	54	1	1
Carnegie Asia A	LP65010734	1 590	0	0
Carnegie Fastighetsfond Norden A	LP68137301	3 815	0	0
Carnegie Indienfond A	LP65011074	2 101	0	0
Carnegie Investment Fund - Nordic Equity 1A Cap	LP68155300	256	0	0
Carnegie Rysslandsfond A	LP60047979	4 542	0	0
Carnegie Smabolagsfond A	LP68143194	2 270	0	0

Fund Name	Lipper ID	TNA(mSEK)	Ethical dummy	Eco-labelled dummy
Carnegie Sverigefond A	LP60046685	18 975	0	0
Catella Nordic Long/Short Equity RC SEK	LP68135380	243	0	0
Catella Smabolagsfond	LP60048093	8 221	0	0
Catella Sverige Aktiv Hallbarhet	LP60048092	4 126	1	0
Cliens Smabolag A	LP68391191	1 281	1	0
Cliens Sverige A	LP65023071	193	1	0
Cliens Sverige Fokus A	LP68135420	3 354	1	0
Coeli SICAV I - Frontier Markets R SEK Acc	LP68262270	139	0	0
Coeli SICAV I - Global Select R SEK Acc	LP68289691	4 666	0	0
Didner & Gerge Aktiefond	LP60047480	37 036	0	0
Didner & Gerge Global	LP68132320	7 450	1	1
Didner & Gerge Smabolag	LP65150086	11 509	0	0
Didner & Gerge Small and Microcap	LP68276557	1 506	0	0
East Capital Balkan	LP60096797	935	0	0
East Capital Nya Europa	LP60048169	117	0	0
East Capital Osteuropafonden	LP60070960	1 707	0	0
East Capital Rysslandsfonden	LP60048168	4 961	0	0
Ethos Aktiefond	LP65067712	1 981	1	0
Ethos Global Equities IC (SEK)	LP68135384	1 119	1	0
Evli Swedish Small Cap B	LP68021299	79	1	0
Fidelity Funds - Nordic A-SEK-DIS	LP60033982	2 638	0	0
Folksam LO Sverige	LP65010659	46 049	0	0
Folksam LO Varlden	LP65010660	44 984	0	0
Folksam LO Vastfonden	LP65010661	5 726	0	0
Handelsbanken Amerika Tema (A1 SEK)	LP60046533	12 813	0	0
Handelsbanken Asien Tema (A1 SEK)	LP60046534	8 302	0	0
Handelsbanken AstraZeneca Allemansfond	LP65067632	2 160	0	0
Handelsbanken EMEA Tema (A1 SEK)	LP60047613	1 331	0	0
Handelsbanken Europa Tema (A1 SEK)	LP60046841	5 979	0	0

Fund Name	Lipper ID	TNA(mSEK)	Ethical dummy	Eco-labelled dummy
Handelsbanken Global Tema (A1 SEK)	LP60046840	26 738	0	0
Handelsbanken Hallbar Energi (A1 SEK)	LP68281834	4 706	1	1
Handelsbanken Halsovard Tema(A1 SEK)	LP60053480	8 199	0	0
Handelsbanken Japan Tema	LP60046535	4 810	0	0
Handelsbanken Kina Tema (A1 SEK)	LP68281835	2 771	0	0
Handelsbanken Latinamerika Tema (A1 SEK)	LP60047259	3 517	0	0
Handelsbanken Multi Asset 100 (A1 SEK)	LP65010735	16 149	0	0
Handelsbanken Multi Asset 120 (A1)	LP68418758	783	0	0
Handelsbanken Norden (A1 SEK)	LP60046536	25 993	0	0
Handelsbanken Nordiska Smabolag (A1 SEK)	LP60048392	23 017	0	0
Handelsbanken Svenska Smabolag (A1 SEK)	LP60047407	26 995	0	0
Handelsbanken Sverige (A1 SEK)	LP60046532	11 785	0	0
Handelsbanken Sverige Selektiv (A1)	LP68280157	6 684	0	0
Handelsbanken Tillvaxtmarknad Tema (A1 SEK)	LP60047977	17 059	0	0
Humle Smabolagsfond	LP68068168	1 786	0	0
Humle Sverigefond	LP68068167	395	0	0
ICA Banken Modig	LP68173006	308	0	0
IKC Fastighetsfond A	LP68294906	26	0	0
IKC Global Infrastructure A	LP68376823	11	0	0
IKC Opportunities A	LP68139699	134	0	0
Indecap Guide Global C	LP68263172	540	0	0
Indecap Guide Sverige C	LP68263175	747	0	0
Indecap Guide Tillvaxtmarknadsfond C	LP68263173	240	0	0
KPA Etisk Aktiefond	LP60048440	5 486	1	0
Lancelot Avalon	LP68191682	815	0	0
Lancelot Camelot A	LP68153149	3 991	0	0
Lannebo Europa Smabolag A SEK	LP68364848	1 566	0	0
Lannebo Smabolag SEK	LP60051741	29 668	0	0
Lannebo Sverige	LP60051740	3 467	0	0

Fund Name	Lipper ID	TNA(mSEK)	Ethical dummy	Eco-labelled dummy
Lannebo Sverige Hallbar B	LP68087307	891	1	0
Lannebo Sverige Plus	LP65150085	6 418	0	0
Lannebo Vision	LP60051742	4 417	0	0
Lansforsakringar Asienfond A	LP60047262	388	0	0
Lansforsakringar Europa Aktiv A	LP60046912	1 754	0	0
Lansforsakringar Fastighetsfond A	LP60046915	28 000	0	0
Lansforsakringar Global Hallbar A	LP60047718	3 897	1	0
Lansforsakringar Japanfond A	LP60047619	1 777	0	0
Lansforsakringar Smabolag Sverige A	LP60047861	2 487	0	0
Lansforsakringar Sverige Aktiv A	LP60046911	5 867	1	1
Lansforsakringar Tillvaxtmarknad Aktiv A	LP60048257	1 281	0	0
Lansforsakringar USA Aktiv A	LP60047620	931	0	0
Lararfond 21-44 ar	LP60048580	6 089	0	0
Lundmark Aktiv Europa	LP65067623	65	0	0
Macquarie Asia New Stars A SEK	LP68135944	846	0	0
Monyx Strategi Offensiv AC SEK	LP68151955	77	0	0
Monyx Strategi Sverige/Vaerlden AC	LP68175081	2 823	0	0
Movestic SICAV - Movestic Global I (SEK)	LP68395366	1 419	0	0
Movestic SICAV - Offensiv I (SEK)	LP68315631	836	0	0
Navigera Aktie (1)	LP65117779	13 380	0	0
Navigera Aktie (2)	LP68153829	5 795	0	0
Navigera Global Change	LP68373135	750	1	0
Navigera Tillvaxt (1)	LP65117781	6 180	0	0
Navigera Tillvaxt (2)	LP68153830	2 757	0	0
Nordea Aktieallokering	LP65011081	11 258	0	0
Nordea Alfa	LP60046886	18 596	0	0
Nordea Asian Fund	LP60044484	1 262	0	0
Nordea Global Dividend Fund	LP68265686	15 365	0	0
Nordea Inst Aktief Sverige icke-utd	LP68146590	4 244	1	0

Fund Name	Lipper ID	TNA(mSEK)	Ethical dummy	Eco-labelled dummy
Nordea Inst Aktiefonden Stabil icke-utd	LP68146589	1 543	1	0
Nordea Inst Aktiefonden Varlden icke-utd	LP68146591	1 248	1	0
Nordea Olympiafond	LP60046889	468	0	0
Nordea Smabolagsfond Sverige	LP68087308	8 787	0	0
Nordea Swedish Stars icke-utd	LP60047457	12 088	1	0
Nordic Equities Strategy	LP65010707	774	0	0
Nordic Equities Sweden	LP68022623	366	0	0
Norron Active RC SEK Cap	LP68135391	2 890	0	0
Norron Select R SEK Cap	LP68135393	730	0	0
Norron Sicav Alpha RC SEK C	LP68386938	149	0	0
Ohman Global Growth	LP60047561	620	1	0
Ohman Global Hallbar A	LP60048394	13 788	1	0
Ohman Smabolagsfond A	LP60012064	3 051	0	0
Ohman Sverige Hallbar A	LP68226676	2 547	1	0
Ohman Sweden Micro Cap A	LP60047811	3 840	0	0
PriorNilsson Realinvest A-klass	LP68247927	2 384	0	0
PriorNilsson Smart Global	LP68411732	202	0	0
PriorNilsson Sverige Aktiv A	LP68173004	1 874	0	0
Quesada Global	LP68402193	221	0	0
SEB Aktiesparfond	LP60046701	14 534	0	0
SEB Asia Small Caps ex. Japan C (SEK)	LP60075531	846	0	0
SEB Asienfond ex Japan	LP60047266	2 888	0	0
SEB Dynamisk Aktiefond	LP60047131	11 581	0	0
SEB Emerging Marketsfond	LP60047245	6 197	0	0
SEB Europafond	LP60046717	1 993	0	0
SEB Europafond Smabolag	LP60047246	5 414	0	0
SEB Fastighetsfond	LP60046719	688	0	0
SEB Hallbarhetsfond Global	LP60046884	13 305	1	0
SEB Japanfond	LP60047461	1 100	0	0

Fund Name	Lipper ID	TNA(mSEK)	Ethical dummy	Eco-labelled dummy
SEB Lakemedelsfond	LP60047858	11 858	0	0
SEB Latinamerikafond	LP60047764	843	0	0
SEB Micro Cap Fund Cap	LP68065035	3 748	0	0
SEB Nordamerikafond	LP60046718	1 743	0	0
SEB Nordamerikafond Sma och Medelstora Bolag	LP60046705	1 850	0	0
SEB Nordamerikafond Smabolag	LP60047134	2 290	0	0
SEB Nordenfond	LP60047813	6 703	0	0
SEB Osteuropafond	LP60047859	1 053	0	0
SEB Prime Sol Nordic Cross Small C Edge R SEK	LP68471898	76	1	0
SEB Schweizfond	LP60047132	1 741	0	0
SEB Stiftelsefond Balanserad A	LP65104181	6 263	0	0
SEB Stiftelsefond Sverige	LP60048063	3 144	0	0
SEB Stiftelsefond Utland	LP60048450	1 124	1	0
SEB Strategy Growth C SEK	LP65150023	5 645	0	0
SEB Sustainability Fund Sweden- C SEK	LP60012714	3 685	1	0
SEB Sverige Expanderad	LP60046715	10 777	0	0
SEB Sverigefond	LP60046714	15 752	0	0
SEB Sverigefond Smabolag	LP60046709	11 935	0	0
SEB Sverigefond Smabolag Chans/Risk	LP60047406	12 341	0	0
SEB Swedish Value Fund	LP65053901	3 320	0	0
SEB Teknologifond	LP60046703	9 097	1	0
SEB WWF Nordenfond	LP60048448	412	1	0
SPP Aktiefond Stabil A	LP68232713	3 259	1	0
SPP Global Solutions A	LP68170610	3 583	1	0
SPP Mix (100)	LP68324572	651	1	0
Simplicity Kina	LP68102174	41	0	0
Simplicity Sverige	LP68305656	273	0	0
Skandia Asien	LP60047250	2 897	0	0
Skandia Cancerfonden	LP60046845	408	1	1

Fund Name	Lipper ID	TNA(mSEK)	Ethical dummy	Eco-labelled dummy
Skandia Ideer For Livet	LP60047626	814	0	0
Skandia Norden	LP68153145	1 579	0	0
Skandia SMART Offensiv	LP60047625	9 777	0	0
Skandia Smabolag Sverige	LP60048399	4 440	0	0
Skandia Sverige Hallbar	LP68459900	4 308	1	1
Skandia Tillvaxtmarknadsfond	LP68240403	429	0	0
Skandia Time Global	LP60048400	9 574	0	0
Skandia USA	LP60047253	3 718	0	0
Skandia Varlden	LP60046645	5 363	0	0
Skandia Varldsnaturfonden	LP60046846	510	1	1
Spiltan Aktiefond Smaland	LP65150093	1 357	0	0
Spiltan Aktiefond Stabil	LP65010702	6 578	0	0
Spiltan Aktiefond Sverige	LP65010701	1 675	0	0
Spiltan Globalfond Investmentbolag	LP68389873	1 986	0	0
Swedbank Robur Aktiefond Pension	LP60048444	52 883	0	0
Swedbank Robur Allemansfond Komplet	LP60046671	65 594	0	0
Swedbank Robur Amerikafond	LP60047235	11 677	0	0
Swedbank Robur Asienfond	LP60046682	4 049	0	0
Swedbank Robur Bas Aktier	LP68278367	3 480	0	0
Swedbank Robur Ethica Global	LP60046683	4 163	1	1
Swedbank Robur Ethica Global Mega	LP65010700	15 315	1	1
Swedbank Robur Ethica Sverige	LP60046568	8 602	1	1
Swedbank Robur Ethica Sverige Mega	LP65010696	2 652	1	1
Swedbank Robur Europafond A	LP60047237	8 888	0	0
Swedbank Robur Exportfond	LP60047173	10 728	0	0
Swedbank Robur Fastighet	LP60046677	7 364	0	0
Swedbank Robur Global Emerging Markets	LP65067626	10 100	0	0
Swedbank Robur Global High Dividend	LP68241439	1 977	0	0
Swedbank Robur Globalfond A	LP60047630	27 034	0	0

Fund Name	Lipper ID	TNA(mSEK)	Ethical dummy	Eco-labelled dummy
Swedbank Robur Humanfond	LP60046576	2 414	1	1
Swedbank Robur Japanfond	LP60047234	4 031	0	0
Swedbank Robur Kapitalinvest	LP60046675	40 603	0	0
Swedbank Robur Kinafond	LP65032681	2 667	0	0
Swedbank Robur Medica	LP60049126	10 033	1	0
Swedbank Robur Nordenfond	LP60046977	6 287	0	0
Swedbank Robur Ny Teknik	LP60047714	15 119	0	0
Swedbank Robur Osteuropafond	LP60047716	5 636	0	0
Swedbank Robur Ravarufond	LP60047232	596	0	0
Swedbank Robur Rysslandsfond	LP60048069	7 318	0	0
Swedbank Robur Smabolagsfond Europa	LP60048259	12 568	0	0
Swedbank Robur Smabolagsfond Global	LP60046681	7 125	0	0
Swedbank Robur Smabolagsfond Norden	LP60046680	9 414	1	0
Swedbank Robur Smabolagsfond Sverige	LP60047389	19 600	1	0
Swedbank Robur Sverigefond	LP60046676	14 820	0	0
Swedbank Robur Sverigefond MEGA	LP60047769	21 113	0	0
Swedbank Robur Sweden High Dividend	LP65044253	1 614	1	0
Swedbank Robur Talenten Aktiefond Mega	LP60047768	7 594	1	0
Swedbank Robur Technology	LP60046678	48 262	0	0
Tundra Frontier Africa Fund	LP68212876	58	0	0
Tundra Pakistan Fund, A (SEK)	LP68135415	160	0	0
Tundra Sustainable Frontier Fund A SEK	LP68207359	1 301	1	1
Tundra Vietnam, A (SEK)	LP68260371	385	0	0
CB Saver Earth Fund	LP68472539	10	1	1

Table 10: Appendix, Correlation matrix

	Total Net Assets	Natural logarithm of TNA	Monthly Return	Monthly volatility	Sharpe ratio	Implied Flow	Ethical dummy	Eco- labelled dummy	Large mutual fund company dummy	Nordic market dummy	Expense ratio
<i>Natural logarithm of TNA</i>	0.7022										
Monthly Return	0.0252	0.0324									
Monthly volatility	-0.0187	0.0023	-0.3864								
<i>Sharpe ratio</i>	0.0321	0.0398	0.9239	-0.3692							
Implied Flow	-0.0226	-0.0922	0.0237	-0.0169	0.0177						
<i>Ethical dummy</i>	-0.1212	-0.0999	-0.0060	-0.0460	0.0028	0.0211					
<i>Eco-labelled dummy</i>	-0.0474	-0.0602	-0.0042	-0.0081	-0.0044	0.0378	0.4019				
<i>Large mutual fund company dummy</i>	0.2476	0.4997	0.0218	0.0817	0.0212	-0.0411	-0.0132	0.0643			
<i>Nordic market dummy</i>	0.1230	0.1284	-0.0062	-0.0252	0.0098	-0.0117	0.1401	0.0197	0.0197		
<i>Expense ratio</i>	-0.2561	-0.2214	-0.0042	0.0733	-0.0225	0.0168	-0.1849	-0.0547	-0.0930	-0.2030	
<i>Number of years active</i>	0.3604	0.5259	0.0254	0.0963	0.0165	-0.0581	-0.0754	0.0029	0.4920	0.1275	-0.1858

Table 11: Appendix, list of mutual funds with inconsistent reports

Illustrates the list of all 36 equity mutual funds with inconsistent reports of either NVA, TNA or both, hence excluded from the study. These mutual funds do fit according to the criteria in the mutual fund screening and would have been included if not for the inconsistent reports. To clarify, these mutual funds have been removed since the data could not be used to run the regression. The table include the mutual funds name and Lipper ID.

Fund name	Lipper ID
Agenta Globala Aktier	LP65067741
Agenta Svenska Aktier	LP65067738
Agenta Tillvaxtmarknader	LP68061125
Quesada Sverige	LP60075718
C WorldWide Sweden Small Cap 1A Cap	LP68040068
C WorldWide Sweden 1A Cap	LP68034205
SP Aktiv- Offensiv	LP68308211
Case All Star	LP68393450
Cicero Sverige A	LP68572965
Aktiespararna Topp Sverige	LP60049132
Aktiespararna Direktavkastn A	LP68376820
Lannebo Smabolag Select	LP60053482
Carnegie Global A	LP68305706
Rhenman&Partners Gl Opp L/S RC1 SEK C	LP68373110
Handelsbanken MicroCap Sverige	LP68380929
Swedbank Robur Microcap	LP68418757
Nordea Pro Stable Return SEK	LP68266548
Indecap Guide 2 C	LP68340441
Danske Invest SICAV Europa (SEK) SA	LP68453439
Danske Invest SICAV SRI Global SA	LP68453447
Danske Invest SICAV Sverige SA	LP68453462
Danske Invest SICAV Horisont Aktie SA	LP68453467
Danske Invest SICAV Sverige Beta SA	LP68453491
Carnegie Micro Cap	LP68403315
Pacific Explorer Dynamic A	LP68355555
Didner & Gerge US Small and Microcap	LP68385526
Simplicity Smabolag Sverige A	LP68395406
Ohman Sverige Fokus B	LP68426716
Indecap Guide Q30 C	LP68446095
Danske Invest SICAV Europa (SEK) SA	LP68453439
Danske Invest SICAV Horisont Aktie SA	LP68453467
Danske Invest SICAV SRI Global SA	LP68453447
Danske Invest SICAV Sverige Beta SA	LP68453491
Danske Invest SICAV Sverige SA	LP68453462
IKC Filippinerna B	LP68249584
IKC Asien B	LP68235835