



Sveriges lantbruksuniversitet  
Swedish University of Agricultural Sciences

Department of Economics

# **The Financial Risk and Performance of Swedish SRI Funds**

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## **Abstract**

This study addresses the existing issue of SRI fund categorization in previous research by establishing a framework of how to classify SRI funds. Through this framework, the SRI fund performance analysis becomes more accurate by evaluating the effects of different SRI strategies. In contrast to previous research, this study finds that SRI funds behave differently from conventional funds in terms of risk and return. The evidence suggests SRI funds that excludes sin industries from their investment portfolios have higher risk-adjusted returns than conventional funds.



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# 1 Introduction

This paper sets out to answer the research question:

What is relationship between SRI strategies, and the financial risk and performance of Swedish mutual stock funds.

## 1.1 Background

Sustainable and Responsible Investments (SRI) are a set of investments that incorporates non-financial criteria in their security selection in order to have a positive impact in the environment and/or the society. In recent decades, SRIs have gained increasing attention in the financial industries and has become an important framework in many countries. Sweden is a front-runner when it comes to SRIs and between 2007-2015, SRI assets under management grew from \$191 billion to \$1,552 billion, an over 700 percent increase (Eurosif, 2008, 2016). Furthermore, the number of mutual stock funds with an SRI profile outweigh the number of funds that do not *i.e.* conventional funds<sup>1</sup>.

In 2013, *Sveriges forum för hållbara investeringar* (Swedish Forum for Sustainable Investments) (SWESIF) released framework for disclosing information regarding funds' SRI profiles called the Sustainability Profile<sup>2</sup>. The information provided by the framework is presented as an information sheet in a similar manner as the fund fact sheet and is published on the fund website and a website provided by SWESIF<sup>3</sup>. The SRI became available for private fund companies in 2015 and has since become the industry standard for disclosing SRI information for funds. In 2017, a new version of the SRI profile was released where over 600 funds have disclosed their information (SWESIF, 2017).

In tandem with the rise of SRI funds, recent decades have also been characterized by increasing financial instability and volatility. Since the mid 1990s, the financial sector has adopted a new risk metric known as Value-at-Risk (VaR). VaR is an intuitive risk metric that returns a numeric value (monetary or as a percentage) of how much is at risk in a given time period and confidence interval.

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<sup>1</sup>When screening for SRI stock funds on <https://www.avanza.se/>

<sup>2</sup>For convenience of the study it will be called the SRI Profile for the remaining part of the paper.

<sup>3</sup>[www.hallbarhetsprofilen.se](http://www.hallbarhetsprofilen.se)

## 1.2 The problem

There is a growing literature on the relationship between SRI practices and financial performance, however the exact relationship is not clearly established. Previous research suggest that there is no trade-off of investing sustainable and responsible and financial performance, whereas a new extensive meta-analysis shows a large variation of relationships between SRI and financial performance.

Of the existing literature, the majority of studies study domestic US or UK funds, and to the knowledge of the author only one study has included Swedish fund in their analysis.

Moreover, the current literature has almost exclusively defined fund performance as the metric  $\alpha$  (risk-adjusted return or fund manager skill) from CAPM, or its equivalent from the CAPM extensions such as the Fama French three-factor model or the Carhart four factor model. Risk is only considered implicitly through the  $\alpha$  and most studies fail to consider other risk metrics as performance indicators. In the few papers where risk is considered, the researchers mainly use conventional risk measures such as *volatility* and market  $\beta$ . VaR, which has become a standard metric in the industry is not used in any of the earlier research papers reviewed in this study. In addition, the methodology of classifying SRI funds varies to a great extent between studies, which makes it difficult to compare the results.

In conclusion, the issue of the SRI and financial performance relationship has not successfully been established on a general level and an modern approach to risk has not been considered. Previous research has failed to reach a consensus in how to classify SRI funds and to evaluate the effects of different screens.

## 1.3 Purpose

There are two purposes of this study. First, this study set out to establish a framework of how to categorize SRI funds, in order to promote a consistent classification methodology for future research. Second, this study seeks to examine systematic differences in risk-return relationships depending on SRI classification. It extends the current research by providing evidence for the Swedish market as well as introducing VaR as a performance measure. In order to answer the research question the objectives of the study are: 1) to evaluate and categorize funds based on the SRI profiles of Swedish funds and 2) to quantify the financial risk and performance of SRI funds and conventional stock funds in Sweden.

## 2 Conceptual framework

### 2.1 Sustainable and responsible investments

#### 2.1.1 Definition

Sustainable and responsible investments is one of many notations for investments with an ethical or social agenda. Other commonly used notations are socially responsible investments, ethical investments, sustainable investments, green investments, impact investments, or simply responsible investments. In general the terms can be used interchangeably, however there may be differences depending on the author. For example, ethical investments such as excluding gambling stock must not necessarily be sustainable, as gambling appears to be economically sustainable, it does not have a major negative impact on the environment *et cetera*. (Fabozzi, Ma, & Oliphant, 2008). This study will use the SRI notation used by the European Social Investment Forum<sup>4</sup> ("EUROSIF") and The Forum for Sustainable and Responsible Investment<sup>5</sup> ("US SIF"), that is *Sustainable and Responsible Investments*.

There is no legal definition of what constitutes a sustainable and responsible investment and Sweden. However, there is a general understanding in the industry what the term means. At its core, SRIs are investments which incorporates non-financial criteria in their security selection in order to have a positive impact on the society. There are a few elaborate definitions set by international SRI organizations, such as EUROSIF's which defines an SRI as:

"A long-term oriented investment approach which integrates ESG [environment, social, and corporate governance] factors in the research, analysis and selection process of securities within an investment portfolio."

Similarly, US SIF defines an SRI as:

"An investment discipline that considers environmental, social and corporate governance (ESG) criteria to generate long-term competitive financial returns and positive societal impact".

Notwithstanding the thoroughness of the definitions, what makes an SRI is open to interpretation as investments only have to *consider* ESG issues or integrate ESG factors in the selection process. It is questionable if a fund is sustainable and responsible if it excludes firms that get at least 30 percent of its revenue from coal, while still being allowed to invest in other fossil fuels, which is a common profile of Swedish banks. If

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<sup>4</sup><https://www.eurosif.org>

<sup>5</sup><https://www.ussif.org>



one considers the definition of sustainable development set by the UN which is

”Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (UN, 1987)

the answer is no. Furthermore, the definitions used by EUROSIF and US SIF depend on what is called ESG. ESG are a set of three areas that each range over a large number of issues. Table 1 presents a selection of issues covered by each area that are considered by Morgan Stanley Capital International (MSCI) in their selection process. Again, this raises a question, how many of the ESG issues does a fund have to integrate in their business in order to be considered an SRI fund? According to SWESIF’s website<sup>6</sup>, there is no minimal level a fund has to live up to in order to have an SRI profile.

Table 1: ESG Issues

<b>Environmental (E)</b>	<b>Social (S)</b>	<b>Governance (G)</b>
Climate change	Human capital	Board
Carbon emissions	Labor standards	Pay
Natural capital	Product liability	Ownership
Water stress	Privacy and data security	Accounting
Renewable energy	Stakeholder opposition	Corruption
Green building		Business ethics and fraud

Source: <https://www.msci.com/esg-investing>

A key issue to acknowledge when dealing with SRI funds is that what is considered sustainable, and/or responsible has its foundation in social norms, ethics, and moral which is highly dependent on the region in question. What is considered SRI in Sweden, as secular state, may not be considered SRI in other countries in which religion has a much stronger influence of what is considered ethical. The issue of what is ethical will not be discussed further in this study, however, the issue is important to consider when discussing the results of this study. This is because the rationale of the economic impact of an SRI project may differ between the investor and the market in which the firm is active. For example, gender equality is important in Sweden and some evidence suggests that equality is positively linked with firm performance. With this rationale it is expected that firms that pursue gender equality projects will show positive returns. However, in more patriarchal societies this may not be the case. Consequently, it may be the case that Swedish SRI funds investing in western countries could have certain effects, and other in other regions.

<sup>6</sup>[www.swesif.org](http://www.swesif.org)

### 2.1.2 Swedish marketing criteria

In Sweden, there are seven criteria that *Etiska nämnden for fondmarknadsföring* (The Ethics Committee for Fund Marketing) has issued, which a fund has to fulfill in order to market itself as an SRI fund. The criteria are presented below and are freely translated from the Swedish text.

1. *The fund company must have a well defined process for its security selection based on its selection criteria or considerations that the fund has.*
2. *The fund company, or the concern of which the fund company belongs, must have made an official commitment in relation to a recognized third-party organization where some form of follow-up is included, such as the UNPRI or similar.*
3. *The fund company must on a regular basis control and ensure that the selection process is followed. This is a question for the whole company and a responsibility for the executive management.*
4. *The fund company must in a clear and easy manner disclose the company's investment policy for the fund, including information regarding the selection criteria, revenue caps, the companies selection process for the fund, and in what way the process is controlled and ensured.*
5. *The information must be reported through a description of the fund's orientation with regards to sustainable investments. Hållbarhetsprofilen is an example on such format. The description must be available on the company's website.*
6. *The fund company must at least once per year disclose how the investment policy is fulfilled. To the extent that deviations have occurred, the fund company must inform what measures have been taken because of this.*
7. *If the fund company in its advertisement presents that investments in some industries are excluded, a maximum of five percent of the revenue of the firm in which the investment is allocated, or the concern that the company belongs to, is allowed to concern business that does not live up to the specified requirements that the fund company has ordered. This must be clear to the investors.*

The industry standard for disclosing SRI information in Sweden is the aforementioned report in the fifth criteria *Hållbarhetsprofilen* (The SRI Profile) which is provided by SWESIF. This is an information sheet in which funds declare their SRI profile with information regarding the above mentioned criteria. The information is provided by the fund company and is not subject to any review or approval by a third party. A more detailed presentation of the content is found in section 3.1 *Data* and a full disclosure form in English can be found in Appendix A. The information sheets are published on SWESIF's website *Hallbarhetsprofilen.se*. In short, conventional funds do not have an SRI profile at *hallbarhetsprofilen.se* and SRI funds publish in what way they deal with ESG issues.

### 2.1.3 Investment strategies

There are a three major strategies SRI funds use in their selection process. The oldest and most commonly used one is to employ a negative screen, which excludes firms that engages in unwanted activities from the investment portfolio. Common negative screens are to exclude a certain type of industries known as *sin industries* active in *e.g.* tobacco or alcohol production, or to exclude certain countries. Another more modern type of negative screen is to exclude firms if the do not live up to international norms, such as the OECD guidelines for multinational enterprises, UN Global Compact, and the UN Principles for Responsible investments (UNPRI). For purpose of brevity, the reader is referred to each organization's website for further reading on the subject. In short, these types of negative screens excludes firms based on their behavior in regards to human rights, labor, environment and anti-corruption<sup>7</sup>.

The second most frequently used strategy is to employ a positive screen. Positive screens includes firms with desirable characteristics in the portfolio. Example of positive screening criteria is selecting stock with good labor relations or with a high degree of transparency. Special cases of positive screening come in form of themed investing (*e.g.* renewable energy or water), or impact investing where funds for invest in certain projects or business with measurable positive SRI effects.

The third strategy is what is known as *fund company engagement*, where the most commonly used method is to vote on ESG issues on a company wide basis. Other methods are to have dialogues with potential investment prospects, try to affect in cooperation with other investors, or to try to affect through external suppliers/consultants.

It should be noted that the majority of funds use a combination of the above mentioned strategies.

## 2.2 Theoretical framework

### 2.2.1 Efficient market hypothesis

A common assumption made in the financial literature is that markets are (at least relatively) efficient. This stems from the efficient market hypothesis (EMH) proposed by Fama (1970) which state that financial asset prices reflect all available information on the market. Consequently, day-to-day differences in stock pricing, *i.e.* stock returns, are based on new information being available to the market. Consistently over- or under-performing other portfolios *e.g.* the market, requires a continuous stream of information,

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<sup>7</sup><http://mneguidelines.oecd.org/guidelines>, <https://www.unglobalcompact.org>, <https://www.unpri.org/pri/about-the-pri>.

that on average, prices a certain portfolio higher than other portfolios.

### 2.2.2 Positive effects

SRI funds which employ positive screens are argued to experience increased returns based on what is known as the stakeholder theory (Barnett & Salomon, 2006). The argument follows that firms that undertake projects that promote good relationships between the firm and its stakeholders, *e.g.* employees or suppliers, have a competitive advantage against other firms (Barnett & Salomon, 2006). By promoting good labor relations, firms would for example attract competitive employees, that in turn could lead the firm to a stronger position on the market and higher profitability. Humphrey and Tan (2014) questions the validity of the stakeholder theory based on the EMH, because as the information that a firm undertakes a sustainability or responsibility project reaches the market, the expected value-added by the project would quickly be incorporated in the stock price, resulting in a one time price increase. Consequently, in order to systematically outperform the market, firm in SRI funds would continuously have to improve existing SRI projects or implement new SRI projects. Another possible way of SRI having consistent high returns is for the market to consistently underestimate the probability of conventional firms will be subject to negative information (Hamilton, Jo, & Statman, 1993).

In addition, positive screens are argued to reduce idiosyncratic (firm-specific) risk (Humphrey & Tan, 2014). A firm that is concerned with the safety and health of its employees is less likely to be sued or have strikes than a firm that does not care about its employees. Consequently a responsible firm will outperform conventional firms.

Due to the underlying controversial nature of *sin* industries, they are subject to high negative headline risk and higher litigation risk (Fabozzi et al., 2008). As the pricing includes expectations of the future, these risks affect the stock valuation of sin stock in a negative way. Consequently, negative screens that exclude sin industries are expected to be subject to lower idiosyncratic risk by avoiding the negative headline and litigation risk.

### 2.2.3 Neutral effects

SRI can be expected to not differ from the market at all. According to conventional pricing theory, expected stock returns are solely determined by the market risk premium, and does not account for social norms (Fabozzi et al., 2008). That is, the market does not price SRI. In practice, this means that there are enough investors that purchase stock based solely on risk, that investors who sell due to non-compliance with SRI will not affect the price of the stock (Hamilton et al., 1993).

#### 2.2.4 Negative effects

Negative screens are argued to have the opposite effects on risk and return compared to positive screens. Firstly, as shown by Adler and Kritzman (2008), exclusion based on *any* criteria will result in lower returns due to missed opportunities. This is in line with the evidence found by Fabozzi et al. (2008) who in their paper study the performance of the sin industries pornography, alcohol, biotech, defense, gambling, and tobacco. They find that over the period 1970-2007, all sin industry portfolios outperform the market, both in terms of magnitude and frequency (Fabozzi et al., 2008). Overall, the combined sin portfolio outperformed the market by 11% annually and had negative returns only 2 years over the period as opposed to 9 years for the market (Fabozzi et al., 2008). Fabozzi et al. (2008) argues that there are three major reasons sin industries would outperform markets. 1) It is costly live up to SRI practices, such as taking care of waste products, 2) sin industries provide thorough financial reports of high quality in order to attract investors, and 3) sin industries have considerably high barriers to entry which results in the firms in the market have close to monopoly power (Fabozzi et al., 2008).

Related to the findings of Adler and Kritzman (2008), Humphrey and Tan (2014) argues that by having a restricted *investment universe* (the countries, markets and instruments a fund invests in) due to different screens, SRI funds are not able to fully diversify their holdings. As a result, the portfolios will be subject to higher idiosyncratic risk.

Another hypothesis is that sustainable investors accept a lower return in exchange for SRI practices, lowering the expected returns for SRI funds (Hamilton et al., 1993).

### 2.3 Previous research

#### 2.3.1 ESG and financial performance

The most extensive and recent studies in the field of ESG and financial performance is a paper written by Friede, Busch, and Bassen (2015). Friede et al. (2015) set out to address the issue of the ambiguity presented by individual studies, by reviewing over 2000 empirical studies published in the last five decades. By summarizing the aggregate results from individual studies the authors aim to be able to present the general effects of ESG on financial performance (Friede et al., 2015). In their sample, both studies on ESG and corporate financial performance (CFP) and studies on SRI fund performance and financial performance are included

The paper of Friede et al. (2015) looks at the evidence on *corporate financial performance* and ESG criteria, which includes a mixture of portfolio and non-portfolio studies. In general, as funds are built of firm ownership the effects should translate directly to

ESG and fund performance. However, this is not necessarily the case as fund performance or indices can deviate from primary fund data (Friede et al. 2015). For example, over the whole sample, the authors find that 48.2% of all studies find positive effects, 10.7% find negative effects, 23.0% find no effects, and 18.0% find mixed results (Friede et al., 2015). In contrast, when breaking down the sample to portfolio studies, the corresponding numbers are 15.5%, 11%, 36.1%, and 37.4% (Friede et al., 2015).

Friede et al. (2015) further breaks down the analysis to evaluate the separate E, S, and G effects on CFP and find rather homogeneous distributions of positive versus negative findings across the different categories. Governance studies find the highest share of positive relationships where 62.3% of the cases had positive findings compared to 9.2% of the cases showing negative relationships (Friede et al., 2015). For E and S the corresponding numbers are 58.7%/4.3% and 55.1%/5.1% respectively (Friede et al., 2015). In addition, a regional analysis is included which find that European studies find the lowest share of positive findings (26.1%) and emerging markets studies have the highest share of positive findings (65.4%) (Friede et al., 2015).

The paper by Friede et al. (2015) contributes with a few key insights. First, in general there ESG appears to have a positive effect of CFP to a higher degree than pure negative effects (Friede et al., 2015). This suggests that SRI funds would outperform the market, if the effects are directly transferable from the underlying firms to the fund. Notwithstanding, the share of negative, neutral, and mixed findings combined still is larger than the share positive findings, hence, one cannot state and clear relationships. Second, the effects of portfolio ESG on performance appears to be even more ambiguous. Third, it does not appear to be any significantly different effects depending on which ESG issue is pursued. Fourth, it appears to be important to consider regional markets in the analysis. In conclusion, a general effect of ESG and CFP may be difficult to establish, which makes it important to study country specific effects, such as the Swedish fund market.

What is considered as performance varies between the papers and is at such not defined. This is becomes an issue when using the conclusions to anticipate the effects on fund financial performance.

### 2.3.2 SRI fund performance

There are three main methods to evaluate SRI fund performance. The first method is to construct fund of funds portfolios and evaluate the performances against a benchmark. Most commonly two portfolios are formed, one conventional and one SRI which are tested against the market portfolio. The second method is by simulation, where the researcher specific criteria for stock selection in order to replicate the behavior of funds. This method does not rely on fund data but on stock data. The third method is what is known as *matched pair analysis* in which conventional and SRI funds are matched

based on certain criteria such as age, size, or fund company, and inferences are drawn from the performance differences. Independent of the methodology, fund performance is measured mainly by its  $\alpha$ . Technical explanation of the performance are developed in section 3.2 Method.

Kreander, Gray, Power, and Sinclair (2005) conducts a matched pair analysis of 60 funds in UK, Netherlands, Germany and Sweden using weekly data over the period 1995-2001. They define ethical (SRI) funds as any fund that has a non-financial ethical criteria for security selection and they matched funds based on age, size, country and investment universe (Kreander et al., 2005). Fund performance was measured using *Sharpe's ratio*, *Treynor ratio*, and *Jensen's alpha* (CAPM). Overall, the authors did not find any significant evidence that SRI fund and conventional funds performed differently. Of the seven Swedish fund pairs in the study no systematic differences could be found either (Kreander et al., 2005). An issue with using a matched pair analysis is that one needs a large initial sample in order to have an acceptable sample size. The full sample can be seen as satisfactory, however no valid country-specific inferences can be made using a sample of 7 pairs.

In another matched pair analysis, Bauer, Koedijk, and Otten (2005) evaluates SRI fund performance using a sample of 103 SRI funds and 4384 conventional funds. The markets analyzed are the US, UK and Germany using monthly return data from 1990-2001 of domestic equity funds (Bauer et al., 2005). SRI funds are defined as having an ethical screen according to Morningstar, EIRIS, and Ecoreporter (Bauer et al., 2005). The performance measure used is the *Carhart alpha* which is argued to be an improved model for fund performance analysis than CAPM by controlling for size, book-to-market, and momentum factors. In addition, the authors test if SRI indices are better at explaining SRI fund performance than standard indices. Bauer et al. (2005) do not find any statistically significant evidence between SRI and conventional funds in terms of Carhart alpha. However, to their surprise they do find that SRI indices are worse than conventional indices (Bauer et al., 2005). One inconvenience with this study is that it only accounts for domestic funds. Financial markets are increasingly global and there might exist different effects for different types of funds.

In a more recent study, Humphrey and Tan (2014) set out to extend the SRI fund literature by evaluating the effects of different screening strategies. In addition to the standard performance measure (Carhart)  $\alpha$ , the authors also evaluate risk metrics as performance measures. The risk metrics considers are Sharpe's ratio, volatility, market beta and standard errors. They simulate funds with negative and positive screens that invest in stock included in the S&P500 index. The negative screen excludes tobacco, alcohol, gambling and defense/weapons, the positive screen includes firms engaging in community, corporate governance, diversity, employee relations, environment, human rights and product (Humphrey and Tan, 2014). The authors do not find any evidence for screening affecting a portfolio's risk or return, by any performance measure (Humphrey and Tan, 2014). One drawback of this study is that inferences from stock behavior may not be perfectly transferable to fund behavior. Moreover, one criteria was needed to be

met in order for a portfolio to be considered as SRI. This does not contradict the reality in terms of what is allowed, however it does not represent the reality well. Similar to Bauer et al. (2005), this study also only considers domestic funds, however only in one market, and to draw final inferences from these results may be inappropriate.

In contrast to the above mentioned studies, Cortez, Silva, and Areal (2011) studies the performance of SRI global funds. Cortez et al. (2011) uses a sample of 39 SRI European global funds from seven European countries including the UK, and seven US funds over the period 1996-2008. The authors use third party resources to identify funds as SRI. Fund performance is measured using three variations of the conventional  $\alpha$  and which is tested against one conventional index and one SRI index. The authors conclude that European SRI funds do not perform differently from the benchmarks, whereas US SRI shows some tendencies to under-perform (Cortez et al., 2011). One potential explanation for this difference is argued to be that US SRI funds tend to use negative screens as opposed to European funds that use positive screens more frequently (Cortez et al., 2011).

In summary, the pure SRI fund research papers suggest that there is no difference in neither the financial risk nor financial performance between SRI and conventional funds. However, these articles do not fully explain the effects of SRI funds. None of the studies have for example tested different screens over different investment universes. However, the findings of the aforementioned articles suggest that it may important to consider fund behavior as separate from the behavior of the underlying stocks, based on the contradicting finding from Friede et al. (2015).

### **2.3.3 Best practice**

One of the possible explanations of why the research shows such varied results on the relationship between ESG and financial performance may be because the methodology differs between the studies. In their paper, Chegut, Schenk, and Scholtens (2011) set out to review SRI fund performance studies to identify potential issues in researchers' methodologies and to contribute with a suggestion of best practices.

The authors use two different approaches to identify common practices and themes in the literature. First, they do a content analysis which returns the number of times a practice occurs in the literature. Second, the authors use a meta-ethnography method to uncover similarities or demarcations between papers. They use a sample of 41 studies published between 1963 and 2007, which covers 21 countries and 22 different data sources (Chegut et al., 2011).

In total, Chegut et al. (2011) identify and discuss five key areas researchers should improve, which are summarized in the following sections.



1) The authors identifies that studies vary in the way they use their *data* (Chegut et al., 2011). The main concern regards how studies use price data in order to calculate returns. Studies either calculate returns by using gross price data, by including dividend yields, by including the annual management fee (also known as total expense ratio (TER)), or by combining the two latter methods (Chegut et al., 2011). The best practice according to Chegut et al. (2011) is to calculate returns net off dividend and TER.

2) *Social responsibility verification* is the issue of verifying that the SRI funds in the sample are in fact SRI. This can be verified in two ways, either the author independently verifies the fund profiles or one can rely on a third party source. Chegut et al. (2011) deem best practices to independently research the funds using multiple sources and verifying the findings using a third party source. In addition, the researches is to address the difference in standards that may exist between regions, where definition, measurement and assessment of SRI are key issues.

3) *Survivorship bias* is a common issue for fund research. Studies either do not deal with survivorship bias at all, recognize it but do not deal with it, or recognize an correct the bias. Best practices is to correct the survivorship bias, and if that is not possible the researcher has to recognize its impact on the results (Chegut et al., 2011).

4) *Benchmarks* are important to consider because the choice can considerably impact the results. In general, three types of benchmarks are used: conventional indices, sustainability indices, or matched pair analysis. Matched pair analysis is a methodology where one matches SRI funds and conventional funds with similar properties such as size, age, and region. There is a discussion in the literature whether SRI funds performance should be assessed by a conventional or SRI index, however there is some evidence that standard indices are better at explaining SRI fund performance (Chegut et al., 2011). To conduct best practices one should use several indices, both conventional and SRI, and compare the results (Chegut et al., 2011).

5) *Sensitivity and robustness*, the authors present various way of constructing the data to assess the validity of the results. This ranges from fund compositions such as fund age and size, to the skill of the manager as well as controlling for *e.g.* small cap bias. Chegut et al. (2011) present four areas one should consider when checking for sensitivity and robustness: fund composition (age, size *etc.*), impact of fund management (*e.g.* evolutionary learning effects), SRI strategies used the fund (positive, negative, best-in-class *etc.*), the last is to alternate the specification of models (*e.g.* Carhart alpha).

## 3 Data and Method

### 3.1 Data

This study focuses on mutual stock funds because of two reasons. First, the choice of studying funds is because there are drawbacks in current studies on SRI - fund performance relationship. Second, *mutual* fund are considered because 76% of the Swedish population uses mutual funds as a savings methods (Fondbolagen, 2016). Third, the choice of limiting the study to mutual *stock* funds is because stock investments accounts for 62.18% of total SRI assets (Eurosif, 2016). Moreover, the theoretical framework has its main foundation in ESG-CFP relationships. By including money-market funds (funds that invest in short-term debt securities such as government bonds or currency) or mixed-asset funds (mixture of a stock fund and a money-market fund), the theoretical framework would have to expanded beyond the scope of a master’s thesis.

The majority of fund data is collected using the database Thomas Reuters Datastream. Datastream is a global financial and macroeconomic database providing financial data for 162 markets and is the second most commonly used database in the SRI funds performance literature, only second to the CRSP Survivor Bias Free US Mutual Fund Database (Chegut et al., 2011). The CRSP database has not been used because it only covers US mutual funds.

Datastream has been used to collect fund specific data and market portfolio benchmarks. The collected fund specific data are *name*, *Net Asset Value* (NAV), *dividend rate*, *total expense ratio* or TER, *asset class*, and *regional investment universes*. The market data collected are *market portfolio indices*. NAV is the fund equivalent of stock price and is used to compute gross returns. The returns calculated is the returns achieved by the investor which makes it necessary to adjust the gross returns. *Dividend rate* has been collected to adjust the gross returns to accurately reflect the returns received by the investor<sup>8</sup>. In addition to dividend rate, the *TER*, has to be included to calculate the return received by the investor *net of fees*. The *asset class* of the fund is gathered in order to identify which funds are equity funds, mixed asset funds, or money-market funds. The *regional investment universes* are collected in order to be able to categorize funds by their investment restrictions based on region such as domestic, global, or Europe. The *age* of the fund is collected to use as a control in a robustness check. Finally, the *market portfolio index* for Sweden is the SIX Portfolio Return Index (SIXPRX), which is the Swedish benchmark for domestic stock funds. For international funds, the *market portfolio indices* are the Dow Jones Global Index (DJGI), Financial Times World Index (FTSE World), Dow Jones Sustainability Index (DJSI), and the Financial Times FTSE4Good Global Index (FTSE4Good). Data is collected for both dead and alive funds.

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<sup>8</sup>Dividend payouts are positive returns for the investor, but negative returns for the funds as the NAV of the fund is reduced when distributing dividend.

Factor loadings data and risk-free rates used to compute risk adjusted Carhart alphas are retrieved from Kenneth French’s database<sup>9</sup>. This database is the database of choice for multiple SRI fund performances such as Humphrey and Tan (2014), Cortez et al. (2011), and Nofsinger and Varma (2014). The data is collected for Europe, Asia ex. Japan, Japan, and the world (global). Data for the Swedish market is not available in Kenneth French’s database. Instead, Swedish factor loadings data is retrieved from the AQR Frazzini & Pedersen database<sup>10</sup>. Data for Europe, Asia, and the world is also collected from the AQR Frazzini & Pedersen database to check the double check the data from Kenneth French’s database in order to establish the liability of the Swedish data. Both databases provides the same data for Europe, Asia, and the world, which suggests that the Swedish data is reliable. The risk-free rate in the data set is the U.S. one-month treasury bill.

The choice of risk free rate for the Swedish market is the one-month treasury bill, which is collected from the Swedish central bank’s website<sup>11</sup>.

The author was able to receive size data from *Finansinspektionen* (the Financial Supervisory Authority) by request. Size data is not available for all funds, and is not considered in the main part of the analysis but only as a robustness check.

The SRI profiles of the funds is gathered from each fund’s information sheet from SWE-SIF’s website<sup>12</sup>. The profiles are used to categorize funds based on their SRI strategies, in order to examine possible differences in return and risk based on SRI categorization.

Table 2: Summary statistics

VARIABLES	N	mean	min	max
AGE Total	267	14.75	1	60
TER Total	267	1.325	0	4.430
$\overline{R_i - R_f}$ Total	267	0.0374	-16.9	19.1
AGE SRI	227	16.11	1	60
TER SRI	227	1.31	0	4.430
$\overline{R_i - R_f}$ SRI	227	0.000382	-16.9	19.1
AGE Conventional	40	16.11	1	60
TER Conventional	40	1.31	0	4.430
$\overline{R_i - R_f}$ Conventional	40	0.0321	-13.7	11.9

Where TER is denoted in annual percentage, and

$\overline{R_i - R_f}$  is denoted in daily percentage.

<sup>9</sup>[http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data\\_library.html](http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html)

<sup>10</sup><https://www.aqr.com/Insights/Datasets/Betting-Against-Beta-Equity-Factors-Daily>

<sup>11</sup><https://www.riksbank.se/en-gb/statistics/search-interest-exchange-rates/>

<sup>12</sup><https://www.hallbarhetsprofilen.se>

The large values of the mix and max values in Table 2 the excess returns are confirmed using Avanza's<sup>13</sup> fund search tool and are partly a result of the Brexit referendum.

## 3.2 Method

This study will evaluate fund performance by construction fund of fund portfolios and test them against the market and a conventional portfolio. In a matched pair analysis one has to match funds with similar characteristics, such as age, investment universe, and investment style. Due to the small sub-samples when categorizing the funds according to SRI strategy, a matched-pair analysis is not appropriate to use for this study. In order to conduct a simulation study one would have to construct appropriate negative and positive screen, and then evaluate each stock in relation to said screens. Furthermore, it relies on correctly specifying parameters to model funds behavior, which results in increased risk for misspecification. At the work necessary to appropriately employ a simulation study goes beyond the scope of a master's thesis. Consequently, a simulation method is not considered for this study.

### 3.2.1 Fund sample

As a first step, the sample is narrowed down by excluding mixed asset funds, bond funds, and money market funds, leaving only equity funds. Secondly, funds that are traded on the Swedish market but are not legally registered in Sweden are excluded using data from Morningstar. Thirdly, funds that are less than one year old are excluded from the sample. Fourth, dead funds have been excluded from the sample due to lack of historical SRI data for funds. Lastly, for funds with multiple trenches<sup>14</sup> only the A trench has been used. The final sample consist of 227 SRI funds and 40 conventional funds and descriptive statistics are presented in Table 2.

### 3.2.2 SRI classification

The final sample is categorized according to their SRI profile. The categorization considers the most common screens which are summarized in Figure 2. Only the most frequently used strategies are included as criteria. No funds in the sample declared using thematic investing, impact investing, or negative screens against countries. Because fund company engagement is not fund specific, most strategies in this method have been excluded. Voting is only included because Eurosif considers it to be a key method affecting through SRI (Eurosif, 2016).

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<sup>13</sup><https://www.avanza.se/fonder/lista.html>

<sup>14</sup>Funds can have multiple trenches with different terms for different types of investors. Most commonly, the A trench is available for most investors, whereas B or C trenches often are aimed at institutional investors

In almost all cases, if a fund excludes one weapon-related industry, it excludes all weapon-related industries. Consequently, industries 1-4 of the industry exclusion strategy, have been grouped together under a common category *Weaponry*.

The level of the strategies have been categorized based on the strengths of the expected connection between the strategy and the final outcomes. Consider the *Mild exclusion criteria* (NW strategy), companies only need to "appear to have a *willingness* to change" to not be excluded from the fund. Willingness to change is clearly different from acting for change, and what is apparent is subject to subjectivity. Thus, connection between a fund stating that they use a NW strategy and a firm acting for change is considered weak.

A note of clarification, funds can follow one of the three positive screens, any number of industry exclusion screens, one of the international norms criteria, and any number of fund company engagement strategies.

Figure 1: The SRI Profile

Selection strategy	Explanation	Strategy level (Abbreviation)
<b>Positive screening</b>		
1) Sustainability issues are crucial for the fund manager's choice of companies.	The fund has specific and official criteria for its security selection with regards to environmental, social, and business ethics issues. The analysis of the companies' work with sustainability is crucial for the choice of companies in the fund.	Positive screening strong (PS)
2) The fund manager consider sustainability issues.	Sustainability issues are considered in the economic company analyses and investment decisions, which affects, but does not decide, the choice of companies in the fund.	Positive screening mid (PM)
3) The fund manager has access to sustainability analyses.	The fund manager has access to firm specific sustainability analyses, which in some cases could affect the choice of companies in the fund.	Positive screening weak (PW)
<b>Negative screening</b>		
The fund excludes companies active within the following industries.	<i>Industry exclusion</i>	
	1) Cluster bombs and anti-personnel mines, 2) chemical and biological weapons, 3) nuclear weapons, 4) weapons and/or warfare material, 5) alcohol, 6) tobacco, 7) gambling, 8) pornography, 9) fossil fuels, 10) coal. The fund issues a revenue cap that decides how much of companies revenue is allowed to originate from a sin industry without being excluded from the portfolio. The revenue cap normally ranges from 0-5 percent.	1-4 (W)*, 5 (A), 6 (T), 7 (G), 8 (Po), 9 (F), 10 (C)
	<i>International norms</i>	
1) Strict exclusion criteria	The fund excludes all companies that do not follow international norms set by internationally recognized organisations such as the UN PRI, UN Global Compact, and the OECD guidelines for multinational corporations.	Negative screening strong (NS)
2) Mild exclusion criteria	Companies that do not appear to have a willingness to change to meet, or that are assessed to not address important issues regarding international norms, within an acceptable timeframe are excluded from the fund.	Negative screening weak (NW)
<b>Fund company engagement</b>		
Voting	During shareholder meetings, owners are allowed to vote on sustainability issues.	Voting (V)

A wide range of equally-weighted fund of fund portfolios are constructed in this study. On the highest level, two portfolios are constructed in line with the SRI definition used

by Kreander et al. (2005) and Bauer et al. (2005), where SRI funds are funds with any SRI profile, and conventional funds are funds without an SRI profile.

The SRI portfolio is then restructured into five sub-portfolios based on the screens employed by the funds. Due to the fact that funds often employ multiple screens there will be overlaps between the portfolios *i.e.* funds can be included in multiple portfolios. In order to address this issue, the sub-portfolios are created with as strict criteria as possible. A positive screen portfolio is constructed consisting only of PS strategy funds. Similarly, a negative screening portfolio is generated including only NS strategy funds. Two industry exclusion portfolios are created, one with an ethical criteria that employs a screen against all classical sin industries (industries 1-8), and one with an environmental criteria that screens for coal and fossil energy (industries 9 & 10). Lastly, this study considers a portfolio which is most likely to be *truly* SRI considering UN's definition of sustainability and the international norms. This portfolio employs exclusion screens against all 10 industries, it uses a PS strategy *and* a NS strategy. Furthermore, it excludes all funds that allow more than 1% of a company's revenue to originate from coal. These five portfolios will in the remaining part of the study be called *SRI strategy portfolios*.

In a third step, 12 regional portfolios are constructed based on the regional investment universes of the portfolios. Due to issues with sample size when categorizing by both strategy and region a few measures have been considered. First, only global, European, Asian, and Swedish investment universes are considered. Second, for Europe and Asia, the sin exclusion portfolios screens for weaponry and coal. The negative screening portfolios includes both NW and NS, and the positive screening portfolios includes both PM and PS. Note that the European and Asian industry exclusion portfolios only screen for W and C, but the funds in portfolios may exclude more industries. For example, in the European sin portfolio, half of the funds also excludes pornography in addition to W and C.

For global and Swedish funds the industry exclusion portfolios exclude all industries. The negative screening portfolios only use the NS and PS strategy for negative and positive screening.

For the remaining part of the study, the 12 regional portfolios will be called *Regional portfolios*.

### **3.2.3 Empirical analysis**

In the following sections, the technical definitions of performance measurements are presented.

Following the discussion by Chegut et al. (2011), the returns are calculated net of fees

and accounts for dividend yields according to equation (1).

$$R_i = \frac{NAV_{t1i} - NAV_{t2i} + DIV_{ti}}{NAV_{t2i}} - TER_{ti} \quad (1)$$

Where  $NAV$  is the Net Asset Value, which is the fund equivalent of stock price,  $DIV$  is the dividend yield, and  $TER$  is the Total Expense Ratio, which is the annual fee of the fund.  $TER$  is reported as an annual percentage and is converted to a daily equivalent using equation (2).

$$TER_{daily} = TER_{annual}^{\left(\frac{1}{261}\right)} \quad (2)$$

### Sharpe ratio

The Sharpe ratio is a measurement of reward to total risk of a portfolio and is measured by the excess return over the volatility of the portfolio according equation (3).

$$Sharpe\ ratio = \frac{R_i - R_f}{\sigma_i} \quad (3)$$

Where  $R_i$  is the return of portfolio  $i$  net of fees,  $R_f$  is the risk-free return, and  $\sigma_i$  is the standard deviation of the daily returns of portfolio  $i$ .

### Treynor ratio

Portfolio theory suggests that idiosyncratic risk of a securities should be diversified away in a large portfolio, leaving only the systematic (market) risk. Consequently, it has been argued that the Treynor ratio may be a more appropriate measure in fund analysis since funds often hold a well diversified portfolio. In the Treynor ratio, the total risk is substituted with the portfolio  $\beta_i$  as presented in equation (4).

$$Treynor\ ratio = \frac{R_i - R_f}{\beta_i} \quad (4)$$

Where again  $R_i$  is the return of portfolio  $i$  net of fees,  $R_f$  is the risk-free return, and (market)  $\beta_i$  is the systematic risk of the daily returns of portfolio  $i$ .

Albeit being similar measures, both are included in this analysis based on two argument. Firstly, funds are not necessarily large enough to have diversified away its idiosyncratic risk. Secondly, some of the theoretical arguments of why SRI funds might behave differently from conventional funds are that there in face will be differences in idiosyncratic risk. As a result, the two measures could prove important to the validity of said arguments.

### Carhart Four Factor Model

The Carhart Four Factor Model is an extension of the Fama French Three Factor Model, which in turn is an extension of the conventional CAPM model adapted for fund analysis (Carhart, 1997). In addition to the market premium factor ( $\beta$ ), there are three additional risk factors included in the model, size, book-to-market (or value), and momentum<sup>15</sup>. The inclusion of these factors is argued to better explain mutual fund behavior (Carhart, 1997). The size proxy is called Small Minus Big (SMB) and is defined as the historical return difference between small and large cap firms on the market. The book-to-market proxy is known as the High Minus Low (HML) factor which is defined as the return difference between the high book-to-market and low book-to-market firms on the market. HLM measures the historical returns of value stocks over growth stocks, where value stocks are stocks with a high book-value-to-price ratio. Lastly, the momentum (MOM) factor is the return difference between the highest performing stock and the lowest performing stock in the last 12 months. The MOM factor measures the historical returns of the winners that went up minus the losers that lost value. Carhart (1997) explains that "the coefficients of the model can be interpreted as the "proportion of mean return attributable by the four elementary strategies: high versus low beta stocks, large versus small capitalization stocks, value versus growth stocks, and one-year return momentum versus contrarian stocks".

$$R_{i,t} - R_{f,t} = \alpha_i + \beta_{MKT,i}(R_{MKT,t} - R_{f,t}) + \beta_{SMB,i}SMB_t + \beta_{HML,i}HML_t + \beta_{MOM,i}MOM_t + \epsilon_{i,t} \quad (5)$$

Where  $R_i$  is the fund return  $i$  net of fees,  $R_f$  is the risk free rate,  $\alpha$  is the Carhart alpha,  $R_{MKT} - R_f$  is the market premium,  $SMB$ ,  $HML$ ,  $MOM$  are the fund factor loadings for the Carhart four-factor model.

When running the Carhart Four Factor Model, all benchmarks have been used in line with the recommendations by Chegut et al. (2011).

For the Asian portfolios, all factors have been weighted according to the share of Japanese funds and the share of Asian funds. In addition, for portfolios with varying

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<sup>15</sup>The tendency of stock price to continue to rise if it is going up and continue to decline if it is going down.



investment universes, weighted factors have been created proportionally to the distribution of funds. For example, the conventional portfolio consist of approximately 50% Swedish funds and Nordic funds, and 50% global funds, then a weighted set of factors has been created using a 50/50 weight of Swedish/global factors and is tested.

### 3.2.4 Value-at-Risk

Value-at-Risk has in the last two decades become a standard measurement of risk of financial portfolios and is defined as "the maximum potential change in value of a portfolio of financial instruments with a given probability over a pre-set horizon" (J.P. Morgan/Reuters, 1996).

This study will use Historical Simulation (HS) which is the most frequently used method to calculate VaR. HS has a few advantages over other common methodologies such as RiskMetrics and GARCH. Because it uses historical data, it is non-parametric and does not rely on an assumptions of the distribution of the underlying data (Manganelli & Engle, 2001). Neither does it suffer from any risk of misspecifying models as it does not rely on any valuation models. It does however have some drawbacks. First, it necessary to have a large data set in order to produce statistically significant results. Second, it weights all observations in a period equally, potentially deeming the results irrelevant if the market environment has changes from the first observation to the last. For example, if during the 50 first observations there was a period with abnormally high volatility compared to the present time, the VaR will be overstated because old observations are weighted equally as recent. There exists a variation of the HS methodology called the Hybrid model which weights older observations less than more recent. Theoretically the Hybrid model is compelling, however the methodology includes an unknown weight parameter of which there is no statistical method to estimate, deeming it uncertain (Manganelli & Engle, 2001).

This study uses the Historical Simulation methodology to estimate the Value-at-Risk. The procedure can be summarized into four steps: 1) choose a window of observations, 2) compute daily returns, 3) sort the returns in an ascending order, and 4) choose the quantile of interest (Manganelli & Engle, 2001).

The window of observations is the number of consecutive observations included in the first iteration of the VaR estimate. There is a trade-off between using a short or a long window, and window normally ranges between 100 to 1000 trading days. On the one hand, a short windows exposes the VaR to be affected by seasonality, abnormalities or periods of high or low volatility. On the other hand, a long window includes old data which may be irrelevant to the current market environment. Mutual funds are in general long-term investments, where the stock funds in the study's sample frequently have a investment horizons of at least five years<sup>16</sup>. This study considers both a 250 and a 500

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<sup>16</sup>Based on the fact sheets of the funds.

day window, which approximately represents one and two financial years<sup>17</sup> respectively. From an investor's point of view, a 250 day window may be an inappropriately short time span in order to make valid inferences. However, a 250 day window is a more appropriate size in order to fulfil main objective of this study, which is to evaluate any systematic differences between SRI and conventional funds. That is, the windows are chosen to minimize the drawbacks of the HS methodology by keeping them relatively small. The 500 day window is included as a robustness check.

The second step is to calculate the returns of the funds.

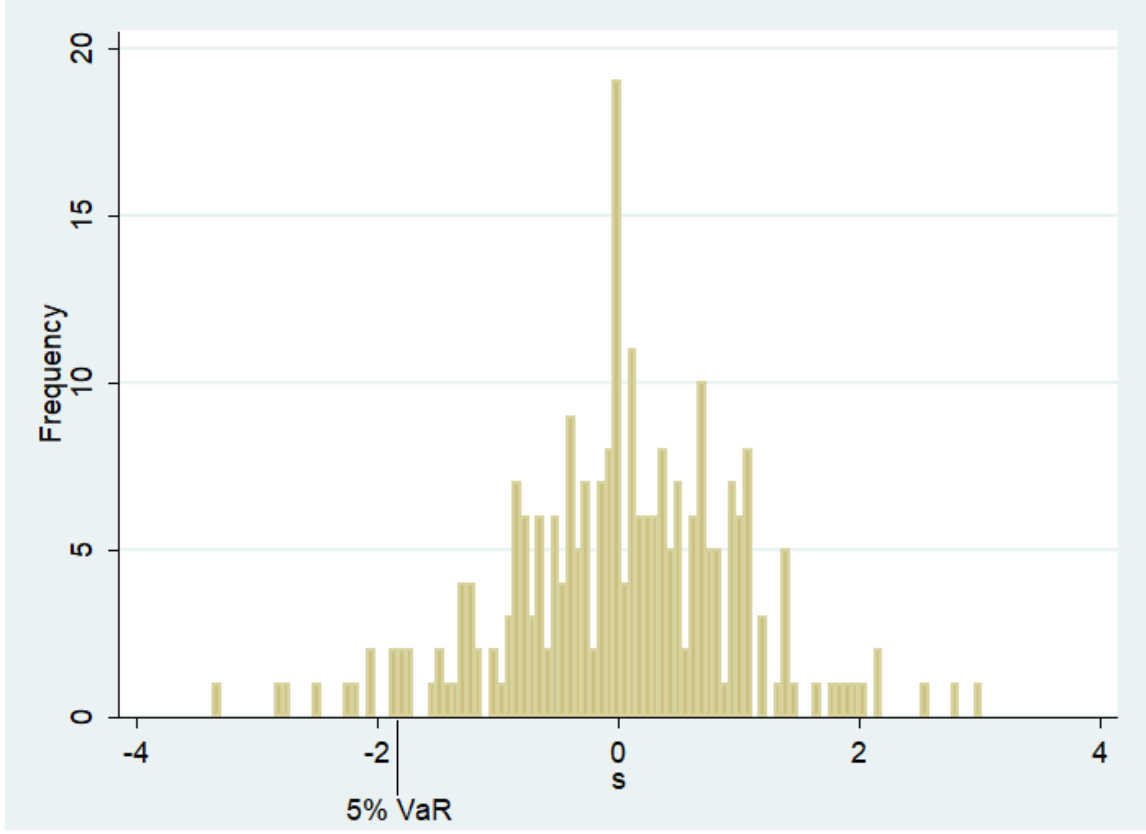
Third, the returns are sorted in an ascending order from the lowest return to the highest of the observations in the window. This returns the distribution of the sample within the window.

Lastly, the 1-day VaR is the return at the  $\theta$ -quantile of interest, generally the 1%- or 5%-quantile. In order to estimate the VaR of the following day, one moves the estimation window one day forward and repeat the process. That is, the 1-day VaR with a 95% confidence interval is at the point where 5% of the returns are to the left of the point, and 95% of the returns are to the right of the point. The VaR of the portfolio is mean VaR returned after rolling the window over the whole time period, in the case of the 250 day window this totals to 1653 iterations. Figure 3 shows a sample window for the SRI portfolio.

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<sup>17</sup>On average there are 261 trading days per year over the chosen time frame of this study.

Figure 2: Value at Risk



### Panel regression

As a last analysis, a panel regression is considered to evaluate possible effects from the different SRI strategies on fund return. In the panel regression all strategies are included, as each funds is analyzed separately instead of as a portfolio. The full regression is presented in equation (6), where conventional funds are set as the reference group.

$$\begin{aligned}
 R_i - R_f = & \alpha + \beta_{SRI,i}D_{SRI} + \beta_{NW,i}D_{NW} + \beta_{NS,i}D_{NS} + \beta_{PW,i}D_{PW} + \beta_{PM,i}D_{PM} + \\
 & \beta_{PS,i}D_{PS} + \beta_{W,i}D_W + \beta_{A,i}D_A + \beta_{T,i}D_T + \beta_{G,i}D_G + \beta_{P,i}D_P + \beta_{F,i}D_F + \beta_{C,i}D_C + \\
 & \beta_{\mathbf{Re},i}\mathbf{D}_{\mathbf{Re}} + \epsilon_{i,t}
 \end{aligned}
 \tag{6}$$

Where  $SRI$  is an SRI portfolio dummy,  $NW$  is a dummy for weak negative screen,  $NS$  is a dummy for strong negative screen,  $PW$  is a dummy for weak positive screen,  $PM$  is a dummy for mid positive screen,  $PS$  is a dummy for strong positive screen,  $W$   $C$  are industry exclusion dummies, and  $Re$  is a regional dummies vector for Sweden (SE), the Nordics (NO), Europe (EU), global (GL), North America (NA), South America (SA), Asia (AS), Africa (AF), and emerging markets (EM).

### 3.2.5 Robustness

Two robustness checks are considered to complete the analysis. First, following the methodology of ? (?) the fund characteristics *Size*, *Age*, and *TER* are tested as explanatory variables in a panel regression.

Second, the conventional portfolio is split into two portfolios based on the two largest investment universes Sweden and global. The purpose of this analysis is to evaluate performance of the regional SRI portfolios.

## 4 Results

Summary statistics are presented in Table 3. Where  $N$  is the number of funds in the portfolio,  $\overline{R_i - R_f}$  is the average excess return net of fees,  $min$  is the lowest daily return of the portfolio, and  $max$  is the highest daily return of the portfolio. The True SRI portfolio shows the highest average returns and the Swedish NS portfolio shows the lowest average excess returns. No portfolio show negative average excess returns.

Table 3: Summary statistics

Portfolios	N	$\overline{R_i - R_f}$	min	max
Conventional	40	0.0281	-4.387	2.455
SRI	227	0.0346	-6.784	4.098
True SRI	11	0.0478	-9.686	6.003
PS	50	0.0366	-6.609	3.804
NS	58	0.0372	-6.497	4.002
Ethical screen	16	0.0409	-5.464	3.322
Environmental screen	36	0.0359	-5.827	3.604
Global exclusion	19	0.0390	-5.946	3.209
Global NS	22	0.0272	-4.114	2.447
Global PS	20	0.0261	-5.336	3.363
Europe exclusion	19	0.0268	-4.740	2.995
Europe N	27	0.0146	-3.460	2.244
Europe P	26	0.0139	-3.283	2.059
Asia exclusion	12	0.0363	-7.679	4.317
Asia N	17	0.0238	-4.970	2.541
Asia P	14	0.0299	-7.562	3.633
Sweden exclusion	13	0.0143	-7.343	4.961
Sweden NS	24	0.000984	-3.576	3.013
Sweden PS	16	0.0142	-6.666	4.717

Table 4 and 5 show correlations among portfolios. All portfolios appear to have high correlations, except for Swedish portfolios compared to other regions.

Table 4: Correlation matrix: SRI strategy portfolios

	Conventional	SRI	True SRI	PS	NS	Ethical screen	Env. screen
Conventional	1.00						
SRI	0.92 (0.00)	1.00					
True SRI	0.88 (0.00)	0.97 (0.00)	1.00				
PS	0.92 (0.00)	0.99 (0.00)	0.96 (0.00)	1.00			
NS	0.92 (0.00)	0.99 (0.00)	0.95 (0.00)	0.99 (0.00)	1.00		
Ethical screen	0.92 (0.00)	0.96 (0.00)	0.93 (0.00)	0.97 (0.00)	0.97 (0.00)	1.00	
Env. screen	0.93 (0.00)	0.98 (0.00)	0.93 (0.00)	0.98 (0.00)	0.99 (0.00)	0.97 (0.00)	1.00

Note: P-values in parentheses

Table 5: Correlation matrix: Regional portfolios

	GI ex	GI NS	GI PS	EU ex	EU N	EU P	AS ex	AS N	AS P	SE ex	SE NS	SE PS
GI ex	1.00											
GI NS	0.93 (0.00)	1.00										
GI PS	0.94 (0.00)	0.94 (0.00)	1.00									
EU ex	0.95 (0.00)	0.96 (0.00)	0.96 (0.00)	1.00								
EU N	0.95 (0.00)	0.94 (0.00)	0.96 (0.00)	0.97 (0.00)	1.00							
EU P	0.93 (0.00)	0.92 (0.00)	0.95 (0.00)	0.96 (0.00)	0.97 (0.00)	1.00						
AS ex	0.96 (0.00)	0.92 (0.00)	0.95 (0.00)	0.95 (0.00)	0.95 (0.00)	0.97 (0.00)	1.00					
AS N	0.94 (0.00)	0.87 (0.00)	0.92 (0.00)	0.91 (0.00)	0.94 (0.00)	0.95 (0.00)	0.95 (0.00)	1.00				
AS P	0.92 (0.00)	0.91 (0.00)	0.92 (0.00)	0.92 (0.00)	0.93 (0.00)	0.93 (0.00)	0.93 (0.00)	0.94 (0.00)	1.00			
SE ex	0.77 (0.00)	0.84 (0.00)	0.82 (0.00)	0.82 (0.00)	0.77 (0.00)	0.70 (0.00)	0.74 (0.00)	0.63 (0.00)	0.72 (0.00)	1.00		
SE NS	0.81 (0.00)	0.88 (0.00)	0.85 (0.00)	0.86 (0.00)	0.81 (0.00)	0.75 (0.00)	0.78 (0.00)	0.68 (0.00)	0.77 (0.00)	0.99 (0.00)	1.00	
SE PS	0.88 (0.00)	0.91 (0.00)	0.91 (0.00)	0.90 (0.00)	0.87 (0.00)	0.83 (0.00)	0.86 (0.00)	0.77 (0.00)	0.84 (0.00)	0.96 (0.00)	0.97 (0.00)	1.00

Note: P-values in parentheses

In Table 6, the results from the first Carhart regression are presented. In general, the model appears to be good at explaining fund returns with adjusted  $R^2$  often over 0.7. The market portfolio factor, size factor, and value factor show highly significant coefficients for all portfolios. The momentum factor appears not to be a good explanatory variable for funds returns, with no statistically significant results. No portfolio show negative risk-adjusted returns ( $\alpha$ ). Four SRI portfolio show positive and statistically significant results, as well as the conventional portfolio. The *True SRI* portfolio show the highest level of  $\alpha$  and the *conventional* portfolio show the lowest level of risk-adjusted returns.

Table 6: Carhart four factor model: SRI strategy portfolios

VARIABLES	Conventional	SRI	True SRI	PS	NS	Ethical screen	Env. screen
$\beta_{MKT}$	0.516*** (0.009)	0.671*** (0.013)	0.839*** (0.019)	0.685*** (0.013)	0.726*** (0.011)	0.689*** (0.011)	0.701*** (0.010)
$\beta_{SMB}$	0.157*** (0.013)	0.198*** (0.019)	0.333*** (0.029)	0.156*** (0.019)	0.163*** (0.017)	0.189*** (0.016)	0.144*** (0.015)
$\beta_{HML}$	0.052*** (0.013)	0.090*** (0.019)	0.131*** (0.029)	0.089*** (0.019)	0.073*** (0.017)	0.096*** (0.016)	0.059*** (0.015)
$\beta_{MOM}$	-0.006 (0.011)	-0.014 (0.016)	-0.008 (0.024)	-0.008 (0.016)	-0.009 (0.014)	-0.002 (0.014)	-0.009 (0.013)
$\alpha$	0.011* (0.007)	0.015 (0.010)	0.022 (0.015)	0.016* (0.010)	0.016* (0.009)	0.020** (0.008)	0.016** (0.008)
Observations	1,902	1,902	1,902	1,902	1,902	1,902	1,902
R-squared	0.736	0.687	0.587	0.708	0.778	0.767	0.809
Adj. R-squared	0.736	0.686	0.586	0.707	0.778	0.766	0.809

Standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

The results from the Carhart regression for the regional portfolios are found in Table 7. In general, the model is worse at explaining fund returns when breaking down the portfolios on a regional basis, with adjusted  $R^2$  low as 0.225 for one portfolio. In contrast, the Swedish portfolios have very high adjusted  $R^2$ . Similar to Table 6, the market and size factors show high statistical significance for almost all portfolios. The value factor seems to be important for explaining excess return in Europe and for the global portfolios. The momentum factor is highly significant for the *Gl ex* portfolio, and significant at a 10% level for *Gl PS*. The *Gl ex*, *EU ex*, *AS ex*, *SE ex* and *SE NS* show statistically significant risk-adjusted excess returns, positive for the all portfolio except for the Swedish portfolios.



Table 7: Carhart four factor model: Regional portfolios

VARIABLES	GI ex	GI NS	GI PS	EU ex	EU N	EU P	AS ex	AS N	AS P	SE ex	SE NS	SE PS
$\beta_{MKT}$	0.486*** (0.016)	0.437*** (0.012)	0.398*** (0.013)	0.256*** (0.012)	0.176*** (0.010)	0.147*** (0.009)	0.429*** (0.020)	0.279*** (0.014)	0.521** (0.022)	0.953*** (0.007)	0.532*** (0.005)	0.827*** (0.010)
$\beta_{SMB}$	-0.325** (0.048)	-0.195** (0.036)	-0.298* (0.033)	-0.085*** (0.034)	-0.054** (0.022)	-0.062*** (0.021)	-0.087** (0.041)	-0.071** (0.030)	-0.097** (0.046)	0.089*** (0.011)	0.051*** (0.007)	0.107*** (0.016)
$\beta_{HML}$	-0.286*** (0.045)	-0.136** (0.032)	-0.102* (0.034)	-0.140*** (0.025)	-0.085*** (0.019)	-0.082*** (0.018)	0.019 (0.047)	0.027 (0.034)	0.037 (0.052)	0.012 (0.012)	0.016** (0.007)	0.040** (0.016)
$\beta_{MOM}$	0.068*** (0.025)	0.029 (0.019)	0.035* (0.020)	0.016 (0.015)	0.017 (0.012)	0.010 (0.011)	-0.016 (0.029)	-0.002 (0.021)	0.012 (0.033)	-0.002 (0.010)	0.001 (0.006)	-0.011 (0.014)
$\alpha$	0.023* (0.012)	0.014 (0.009)	0.014 (0.009)	0.019* (0.010)	0.009 (0.007)	0.009 (0.007)	0.026* (0.014)	0.017 (0.010)	0.018 (0.016)	-0.012** (0.006)	-0.015*** (0.004)	-0.009 (0.008)
Observations	1,902	1,902	1,902	1,902	1,902	1,902	1,902	1,902	1,902	1,902	1,902	1,902
R-squared	0.375	0.441	0.408	0.320	0.276	0.236	0.262	0.227	0.291	0.938	0.925	0.846
Adj. R-squared	0.374	0.440	0.407	0.318	0.274	0.234	0.261	0.225	0.290	0.937	0.925	0.845

Standard errors in parentheses  
 \*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 8 and 9 show the results for the conventional risk metrics for the two groups. Of the SRI strategy portfolios the *Ethical screen* portfolio shows both the highest Sharpe ratio and the highest Treynor ratio. The *SRI* portfolio shows the lowest Sharpe ratio and the lowest Treynor ratio together with the *Environmental screen* portfolio. In the Regional portfolios table, the *GL ex* portfolio has the highest Sharpe ratio, and *EU ex* has the highest Treynor ratio. The *SE NS* have both the lowest Sharpe ratio and Treynor ratio.

Table 8: Conventional risk metrics: SRI strategy portfolios

VARIABLES	Conventional	SRI	True SRI	PS	NS	Ethical screen	Env. screen
Volatility	0.567	0.766	0.994	0.792	0.802	0.750	0.766
Sharpe ratio	0.049	0.045	0.048	0.046	0.046	0.0545	0.046
Treynor ratio	0.054	0.051	0.057	0.053	0.051	0.059	0.051
Observations	1,902	1,902	1,902	1,902	1,902	1,902	1,902

Table 9: Conventional risk metrics: Regional portfolios

VARIABLES	GL ex	GL NS	GL PS	EU ex	EU N	EU P	AS ex	AS N	AS P	SE ex	SE NS	SE PS
Volatility	0.672	0.527	0.533	0.506	0.376	0.347	0.720	0.508	0.825	1.017	0.571	0.914
Sharpe ratio	0.058	0.052	0.049	0.053	0.039	0.040	0.050	0.047	0.036	0.014	0.002	0.016
Treynor ratio	0.083	0.062	0.067	0.105	0.083	0.095	0.085	0.085	0.057	0.015	0.002	0.017
Observations	1,902	1,902	1,902	1,902	1,902	1,902	1,902	1,902	1,902	1,902	1,902	1,902

The 1-day VaRs for each portfolio are presented in the Table 10 and 11. In both tables, the VaRs are statistically significant for all portfolios, confidence intervals, and window lengths. From Table 10 it is clear that the *conventional* portfolio shows the lowest level of value-at-risk for all window lengths and CIs. The portfolio with the highest level of VaR across window lengths and CIs is the *True SRI* portfolio.

Of the portfolios in Table 11 the *EU P* shows the lowest level of VaR and the *SE ex* portfolio shows the highest VaR of all portfolios in both tables.

Table 10: 1-day VaR: SRI strategy portfolios

Window length (CI)	Conventional	SRI	True SRI	PS	NS	Ethical screen	Env. screen
250 days (95%)	-0.980*** (0.008)	-1.301*** (0.010)	-1.643*** (0.014)	-1.352*** (0.011)	-1.351*** (0.011)	-1.284*** (0.011)	-1.278*** (0.011)
250 days (99%)	-1.641*** (0.014)	-2.165*** (0.018)	-2.736*** (0.022)	-2.143*** (0.018)	-2.212*** (0.019)	-2.142*** (0.018)	-2.136*** (0.019)
500 days (95%)	-0.965*** (0.005)	-1.251*** (0.006)	-1.584*** (0.008)	-1.309*** (0.007)	-1.281*** (0.006)	-1.249*** (0.007)	-1.221*** (0.007)
500 days (99%)	-1.649*** (0.012)	-2.156*** (0.011)	-2.943*** (0.019)	-2.234*** (0.015)	-2.265*** (0.012)	-2.189*** (0.011)	-2.155*** (0.013)
Observations 250 days	1,653	1,653	1,653	1,653	1,653	1,653	1,653
Observations 500 days	1,403	1,403	1,403	1,403	1,403	1,403	1,403

VaRs are presented in percentages. Standard errors in parentheses.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Table 11: 1-day VaR: Regional portfolios

Window length (CI)	GL ex	GL NS	GL PS	EU ex	EU N	EU P	AS ex	AS N	AS P	SE ex	SE NS	SE PS
250 days (95%)	-1.098*** (0.009)	-0.884*** (0.008)	-0.867*** (0.007)	-0.829*** (0.007)	-0.643*** (0.005)	-0.584*** (0.004)	-1.200*** (0.008)	-0.818*** (0.006)	-1.403*** (0.011)	-1.666*** (0.015)	-0.956*** (0.010)	-1.520*** (0.014)
250 days (99%)	-1.844*** (0.014)	-1.469*** (0.015)	-1.422*** (0.011)	-1.382*** (0.010)	-1.014*** (0.006)	-0.942*** (0.008)	-1.959*** (0.014)	-1.399*** (0.011)	-2.274*** (0.019)	-2.850*** (0.027)	-1.603*** (0.017)	-2.530*** (0.024)
500 days (95%)	-1.067*** (0.006)	-0.827*** (0.004)	-0.842*** (0.005)	-0.800*** (0.004)	-0.620*** (0.002)	-0.559*** (0.002)	-1.160*** (0.005)	-0.802*** (0.004)	-1.382*** (0.006)	-1.629*** (0.011)	-0.930*** (0.007)	-1.507*** (0.011)
500 days (99%)	-1.872*** (0.010)	-1.465*** (0.010)	-1.500*** (0.009)	-1.448*** (0.009)	-1.040*** (0.006)	-0.965*** (0.007)	-2.001*** (0.011)	-1.425*** (0.009)	-2.242*** (0.011)	-2.824*** (0.024)	-1.604*** (0.013)	-2.624*** (0.017)
Observations 250 days	1,653	1,653	1,653	1,653	1,653	1,653	1,653	1,653	1,653	1,653	1,653	1,653
Observations 500 days	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403	1,403

VaRs are presented in percentages. Standard errors in parentheses.

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

The results of the panel regression are presented in Table 12. Where *ND* is the Nordics, *NA* is North America, *SA* is South America, *AF* is Africa, and *EM* stands for emerging markets., remaining abbreviations are explained in Figure 1. The regressions including the regional dummies show the highest levels of  $R^2$ , albeit the level being relatively low. Moreover, the regional dummies show the highest levels of statistical significance. Factors appearing to affect returns negatively are using a *NW* screen, investing in Sweden, Europe, South America, or Africa, or by excluding tobacco, pornography, or fossil fuel from the portfolio. There appears to exist a positive relationship between employing a *PW* screen, investing in North America, or by excluding weaponry.

Table 12: Panel regression

VARIABLES	(1) $R_i - R_f$	(2) $R_i - R_f$	(3) $R_i - R_f$	(4) $R_i - R_f$	(5) $R_i - R_f$	(6) $R_i - R_f$
SRI	0.004 (0.004)					
NW		-0.003 (0.003)	-0.003 (0.002)			-0.005* (0.003)
NS		-0.004 (0.003)	-0.002 (0.003)			-0.001 (0.004)
PW		0.003 (0.003)	0.004* (0.002)			0.004* (0.002)
PM		0.005 (0.004)	0.006* (0.003)			0.005 (0.003)
PS		0.007* (0.004)	0.004 (0.003)			0.004 (0.003)
SE			-0.013*** (0.002)		-0.011*** (0.003)	-0.011*** (0.003)
ND			0.006 (0.004)		0.008* (0.004)	0.007* (0.004)
EU			-0.011*** (0.003)		-0.009** (0.004)	-0.009** (0.004)
GL			0.003 (0.002)		0.006* (0.003)	0.005 (0.003)
NA			0.019*** (0.002)		0.020*** (0.003)	0.020*** (0.003)
SA			-0.041*** (0.004)		-0.042*** (0.005)	-0.043*** (0.005)
AS			-0.006** (0.003)		-0.004 (0.003)	-0.004 (0.003)
AF			-0.045*** (0.014)		-0.046*** (0.014)	-0.046*** (0.014)
EM			-0.007* (0.004)		-0.006 (0.005)	-0.007 (0.005)
W				0.003 (0.005)	0.007* (0.004)	0.008* (0.005)
A				0.007 (0.005)	0.007 (0.005)	0.004 (0.005)
T				-0.007* (0.004)	-0.008** (0.003)	-0.006** (0.003)
G				0.005 (0.003)	0.004 (0.004)	0.004 (0.004)
P				-0.003 (0.003)	-0.005** (0.002)	-0.006** (0.003)
F				-0.007* (0.004)	-0.005* (0.003)	-0.006** (0.003)
C				0.003 (0.003)	-0.001 (0.002)	0.000 (0.003)
V				-0.003 (0.003)	-0.001 (0.002)	-0.001 (0.002)
Constant	0.028*** (0.004)	0.031*** (0.003)	33 0.035*** (0.002)	0.031*** (0.003)	0.031*** (0.003)	0.032*** (0.003)
Observations	430,563	430,563	430,563	430,563	430,563	430,563
Number of funds	267	267	267	267	267	267
Adj. R-squared	0.0106	0.0222	0.252	0.0381	0.274	0.287

Robust standard errors in parentheses

\*\*\* p&lt;0.01, \*\* p&lt;0.05, \* p&lt;0.1

## 4.1 Robustness check

Table 13 shows the results from the first robustness check. Where *Size* is the fund size in billion SEK at the start of the fund, *Age* is the fund age, and *TER* is the total expenditure ratio or management fee, express as an annual percentage. The variables are tested one the total sample, SRI funds and conventional funds. *TER* shows high statistical significance for all funds. Size is highly significant for the full sample and the SRI funds, but not for the conventional funds. Age appears to not be an important explanatory variable for excess fund returns.

Table 13: Robustness check panel regression

VARIABLES	$R_i - R_f$ Total	$R_i - R_f$ SRI	$R_i - R_f$ Conventional
Size	0.0000026*** (0.0000006)	0.0000024*** (0.0000007)	-0.0000409 (0.0000716)
Age	-0.00000270 (0.00000349)	-0.0000062 (0.0000041)	0.0000094* (0.0000057)
TER	-0.0000873*** (0.0000246)	-0.000805*** (0.0000315)	-0.0000759*** (0.0000274)
Constant	0.0005207*** (0.0000374)	0.0005547*** (0.0000423)	0.00003799*** (0.0000721)
Observations	130,677	106,468	24,209
Number of fund	110	85	25
Adj. R-squared	0.1235	0.0998	0.1928

Robust standard errors in parentheses

\*\*\* p<0.01, \*\* p<0.05, \* p<0.1

Size is variable for fund size in billion SEK, Age is a variable for the age of the fund. TER refers to the total expense ratio of the fund.

Table 14 shows the summary statistics for the conventional portfolio broken down to two sub-portfolios based on its two major regional investment universes: Sweden and the world. The conventional Swedish sub-portfolio show negative average excess returns, and the global sub-portfolio show positive average excess returns with lower absolute values of both min and max.

Table 14: Summary statistics: Conventional portfolios

VARIABLES	N	$\overline{R_i - R_f}$	min	max
cse	11	0.625	-0.950	0.820
cgl	18	0.343	-0.612	0.326

## 5 Discussion

### 5.1 Discussion of results

In this section, the results presented in section 4 Results will be discussed and interpreted.

#### 5.1.1 Returns

From the summary statistics in Table 3 it can be seen that there is not systematic difference between the excess returns of the portfolios. A trend is identified that for all regional portfolios, the exclusion portfolios show the highest average excess returns. Moreover, all SRI strategy portfolios outperform the conventional portfolio, with the True SRI portfolio showing the highest excess returns. As expected, the True SRI portfolio deviates most from the conventional portfolio, both in terms of excess return as well as min and max values. Thus, the net effects of the True portfolio cannot be concluded from this table.

Another identified trend is that all Swedish portfolios show low levels of excess returns and large min and max values, this suggests that the Swedish market behaves differently than other markets. European funds also show relatively low excess returns, however their min and max values do not deviate as much. Nonetheless, most other portfolios also have larger absolute values of min and/or max than the conventional portfolio, save Global NS, Europe N, Europe P, and Sweden NS. This indicates that risk in fact has to be considered in order to conclude relative performance of the portfolios.

From the correlation matrices the following observations can be made. First, SRI strategy portfolios appear to highly correlate with each other, with the True SRI deviating most from the conventional portfolio at 0.88. Second, the Swedish portfolios appear to behave differently from the remaining portfolios, but similar to each other. The results are in line with the previous paragraph.

In Table 6, the risk-adjusted excess returns are presented for the SRI strategy portfolios. There results show that all SRI portfolios reports higher  $\alpha$ s than the conventional port-



folio. The industry exclusion portfolios show highest statistical significance, where the Environmental screen show the highest risk-adjusted excess return that has significance. This is a contradicting finding to previous research of Fabozzi et al. (2008) which show that sin industries outperform the market, and that screening for sin industries does not have any effects Humphrey and Tan (2014).

Similar to the results in Table 3, True SRI portfolio shows the highest risk-adjusted returns of the portfolios. However, the result it is insignificant and the model has the lowest  $R^2$ , limiting the credibility of the results. Moreover, it is surprising to find that the portfolio which is supposed to have the most restricted investment universe, *i.e.* True SRI, is most exposed to the market portfolio ( $\beta_{MKT}$ ). By composition, the True SRI portfolio is made up by approximately 50% Swedish funds and 50% global funds, and would based on that be expected to have a similar exposure as the conventional portfolio which too consist of approximately 50-50 Swedish/global funds. The True SRI portfolio also stands out concerning  $\beta_{SMB}$  and  $\beta_{HML}$ , which indicates that its investment style is different from other portfolios by being more value oriented and invest in smaller companies. The investment style of the True SRI portfolio might reflect the market behavior more than the investment styles of the other portfolios, potentially explaining the higher market exposure.

Contrary to the findings by Bauer et al. (2005), this study finds that SRI portfolios be exposed to the market portfolio to a higher extent than the conventional portfolio. One explanation for this may be that the sample in the paper by Bauer et al. (2005) the 4384 conventional funds should cover a larger share of the market portfolio than the 103 SRI funds in their sample. Whereas in this study, the difference in fund population between the portfolios is smaller, where the conventional portfolio is made up by 40 funds and the average SRI portfolio contains 24.06 funds. In addition, the number of SRI funds of the full sample outweigh the number of conventional funds, potentially indicating that the Swedish fund market is more SRI than conventional. This could be one explanation of why the True SRI portfolio has such a high market exposure. Nonetheless, the market betas of most portfolios are somewhat low compared to other studies which find market betas closer to 0.7-0.9 (Bauer et al., 2005; Cortez et al., 2011; Nofsinger & Varma, 2014).

It appears that the size factor is important in explaining fund behavior where all portfolios, save True SRI, invest largely in large cap stocks. However, there is no apparent systematic difference between conventional and SRI portfolios. Neither is there any clearly visible difference between the portfolios concerning the value factor. The conventional portfolio has the lowest HML coefficient of all portfolios which suggests that it is more growth-oriented than the SRI portfolios. Nevertheless, the difference between the conventional portfolio and the SRI portfolio with the lowest HML coefficient is only 0.003. The momentum factor does not seem to be important to explain fund behavior.

When breaking up the portfolios on a regional basis, more mixed results are manifested. As indicated before, the Swedish market continues to behave differently compared to the

other regions, and are the only portfolios showing negative risk-adjusted returns. One should be careful to not over-interpret these results that Swedish SRI funds necessarily under-perform, it may be that Swedish funds under-perform the market. Table 14 from the report cannot confirm this, as the Swedish conventional portfolio reports higher average excess returns than the global conventional portfolio. This suggests that Swedish SRI funds actually under-perform the market.

Another interesting result for the Swedish portfolios is that the *SE NS* portfolio appears to be much less exposed to the market portfolio than the other two. This indicates that there is some effect by screening for international norm compliance of Swedish stock, by reducing market risk. If this is the case, the *SE NS* portfolio gains idiosyncratic risk by excluding firms, since when adjusting for risk, the excess returns become negative. This in turn indicates that potential effects could cancel each other out, which makes it difficult to identify and effects at all.

All industry exclusion portfolios in Table 7 show statistically significant positive risk-adjusted excess return, save *SE ex*. This suggests that there is a positive relationship between excluding sin industries and risk-adjusted return. None of the negative or positive screens for the regions except Sweden, show any significant results for  $\alpha$ .

In general, the coefficients of the factor loadings data show no systematic differences compared to the conventional portfolio. It appears however that the Swedish portfolios are more invested in small companies than the other portfolio, given the higher value of  $\beta_{SMB}$ .

In conclusion, for most strategies and regions there are no statistically significant evidence that SRI funds perform differently than conventional funds in terms of risk-adjusted excess returns. When breaking down strategies on a regional basis the model performs poorly for all regions except for Sweden, and should not be considered reliable. For Swedish portfolios the negative results may be related to Swedish domestic funds performing poorly, rather than as a result of the SRI strategies. However, there are some indications that *strict* exclusion criteria may be positively related with higher risk-adjusted excess returns.

### 5.1.2 Risk

When evaluating the traditional risk metrics the differences are not as clear in previous sections. Table 8 shows that the Ethical screen portfolio shows the highest reward-risk ratios in both measures. This is the first time where the *True SRI* portfolio does not show the highest results. The Sharpe ratio of the *True SRI* is even lower than the conventional portfolio. The *True SRI* portfolio still behaves differently, with a volatility close to twice the number as the conventional portfolio, however, its performance might not be better. True for all SRI portfolios in Table 8 is that all portfolios have

considerably higher volatility than the conventional portfolio. This suggests that SRI strategies are related with higher risk, which is line with the theory that a restriction on the investment universe leads to higher risk. In contrast, these results are not in line with the previous research of Humphrey and Tan (2014) that found no risk difference for SRI funds.

For the all regional portfolios except Sweden, it may be inappropriate to draw conclusions from the Treynor ratios, because it is likely that the underlying market betas are incorrect. It appears again that the exclusion portfolios for the world, Europe and Asia performs better than the other screens within the regions, when evaluating the Sharpe ratios. Said portfolios have higher Sharpe ratios than the conventional portfolio, albeit the difference is not large.

The Swedish funds stand out when it comes to both Sharpe and Treynor ratio with reward-to-risk ratios closer to zero.

For the SRI strategy portfolios it actually appears that all SRI portfolios have a significantly higher value-at-risk than the conventional portfolio. This is true for all four VaR specifications considered. All VaRs computed with a 250 day window with a 95% confidence interval show a higher risk than when computed using a 500 day window. This suggests that the 250 day VaR might be overstated due to its drawback of catching seasonal effects to a greater extent than a longer window. In most cases the values differ with approximately 0.2-0.6 percentage point. This is a relatively large difference on a daily basis, given that the average daily return of the conventional and SRI portfolios are 0.0281 and 0.0346 as stated in Table 3. However, the relative difference between the values is minute (around 4 percent for the SRI portfolio). In contrast, for all but the SRI portfolio, the VaR calculated using the 500 day window with a 99% CI is higher compared to its 250 day equivalent. Again, this is a relatively small difference.

For regional portfolios, the results show much more variety. Seven out of twelve regional portfolios show lower risk than the conventional portfolio. In all regions except Asia, the industry exclusion portfolio show the highest level of VaR. This is again in line with the findings by Adler and Kritzman (2008), that by restricting a portfolio's investment universe, all idiosyncratic risk cannot be diversified away. By this reasoning, it should also be expected that portfolios with regional restrictions will also have higher risk compared to portfolios with larger, or unrestricted, regional investment universes. There is some evidence that this might be true, where the portfolios with the most strict regional universe *i.e.* the Swedish portfolios, show the highest VaRs comparing each strategy. Nevertheless, the European portfolios all show less risk than the global portfolios, reducing the validity of this conclusion.

It is surprising to observe the vast differences between the *SE NS* portfolio and the remaining Swedish portfolios. It is expected to find similarities between the industry exclusion screen and the international norms negative screen, since both screens are negative. Yet, *SE NS* shows a lower VaR than the conventional portfolio, whereas *SE*

*ex* and *SE PS* show around 0.7 percentage points higher VaRs. Furthermore, it is surprising to find that positive screening result in relatively high VaRs for Asia and Sweden, and relatively low for the world and Europe.

The findings on the risk metrics cohere with the findings on the returns. The SRI strategy portfolios show higher risk than the conventional, and for the regional portfolios the results are mixed except for a trend of higher risks for exclusion portfolios.

### 5.1.3 Panel regression results

It appears that the regional investment universe has the largest impact on returns of the considered variables. Of the statistically significant regional dummies, only North America shows a positive effect. Africa and South America shows the largest negative effects of all variables considered. It should be noted that only three funds invest in South America and only two funds invest in Africa. To a small extent, the exclusion of weaponry, tobacco, pornography, and fossil fuels appears to affect returns negatively. Furthermore, the NW screen and PW screen show negative and positive effects with weak significance. It is unlikely that the NW and PW screens cause this effect by two reasons. 1) Neither strategy should require much effort or money, especially compared to the stronger strategies, and 2) the link between the stated strategy and actual impact are weak. In addition, due to the fact that 22 variables are considered in regression (6), simply by chance two variables should show significant results on a 10% level. Based on the evidence found by Fabozzi et al. (2008) it is expected that all sin industries should show negative coefficients. One reason why W shows statistical significance is because it is the most common sin exclusion industry which is excluded by 217 of all 227 SRI funds.

### 5.1.4 Robustness results

The robustness check of the explanatory power of the *size*, *age*, and *TER* confirms that none of the controls are good explanatory variables for excess returns. For example, the size of the birth of a fund increases daily excess return by 0.01 percentage point per 10,000 billion SEK.

## 5.2 Limitations

In the following section, the limitations of this study are discussed.

The main limitation of this study regards the fund classification based on the SRI profile.

First, the statesmen in the declaration are not evaluated or confirmed by a third party. In combination with a few vague or weak strategies, funds can classify themselves as SRI without much effort. For example, it is enough for a fund manager to have access to SRI information to state that the fund employs a positive screen (PW). As a result, certain funds may be included in the sample as SRI, when they in reality are more close to conventional funds. The same is true for conventional funds. There are transaction costs to produce an SRI profile and some funds may deem it too costly, or simply not worth it, to gather the information needed to establish a fund as SRI. Funds considered conventional in this study, must not necessarily be conventional simply because they do not have an official SRI profile .

Another issue with the SRI profile, is that there is no assurance that a fund has employed the strategies stated in the SRI profile during the full sample period. Until the new version of *Hallbarhetsprofilen* released in 2017, there was no requirement that the information in the information sheet had to be continuously updated. This could make the data less accurate. The author has contacted SWESIF and asked for historical data of when funds have disclosed their information, but the data was not available.

A limiting factor when evaluating which factors influence the returns of the portfolios is due to the fact that it is common for funds to use multiple screens. As a consequence, it is difficult to single out effects to one single factor. For example, there is a pattern where funds that exclude alcohol also exclude tobacco. Consequently, when controlling for alcohol, one also controls for tobacco and the effects of each industry is inseparable. In order to solve this issue, one could follow the methodology of Humphrey and Tan (2014) and simulate portfolios and choose stock based on a set of screens, and screen for individual industries.

The Historical Simulation methodology of computing VaR is only one of several methods of computing value-at-risk. The HS method is favored for its straight forward implementation and that it does not rely on modeled distributions. However, when the observation window is too large it becomes unreliable and it requires a very large data set. As stated earlier, from an investor's point of view, a 95-99% CI might not be an important interval. Since stock funds have investment horizons of over five years, a 1 in 20 days (95%) or a 1 in 100 days (99%) risk might be irrelevant information. A more appropriate CI is probably at a 99.9% or higher. In order to achieve that kind of measure, other VaR methods have to be employed.

This study can only show correlations between the different portfolios and their performance measures, and can only argue possible explanations based on theory. This is a common issue for SRI fund analysis and is one reason why the theoretical arguments still are ambiguous.

Lastly, an important issue when discussing risk of financial instruments of any kind, is that the risk of an instrument can only be extrapolated from historical data. In this study, the market has behaved rather similar over the observed period, with only a few

”flash crashes” where prices drop rapidly over a very short time period. Consequently, the risk measures in this study are not reflecting true risk as the observed period does not include any major financial crises.

### 5.3 Further research

This study could be reproduced in at least to two ways that overcome the issue of relying on the SRI profile for fund classification. First, one could classify funds by analyzing fund holdings and reviewing the stock held by each fund. This would be a time consuming effort, but it would solve the discrepancy issue between a stated strategy and actual holdings. This includes conventional funds that might invest according to SRI but has not disclosed the information. In addition, it would solve the issue of historical holdings which cannot be confirmed by the information sheet. Fund holdings are available up to 2017-12-29 by *Finansinspektionen* on request.

Second, one could simulate portfolios to resemble funds and employ own screens when selecting stock. This too would require time or resources, especially when constructing positive screens. However, it would also overcome the limitations of this study. A simulation method might be less accurate at explaining fund behavior as it relies on correctly specified parameters when simulating the funds. As a result it is subject to risk of model misspecification.

In a larger study this analysis could be done by classifying the SRI profile of funds based on their fund holdings. By reviewing the funds by their holdings a more precise classification scheme could be constructed.

## 6 Conclusions

This study set out to examine the relationship between SRI strategies, and the financial risk and performance of Swedish mutual stock funds. Contrary to previous research, this study find that some SRI strategies behave differently from the conventional portfolio. Through categorizing SRI funds based on their screening strategies it appears that SRI have higher risk than the conventional portfolio, as well as higher excess returns. As expected, the behavior of the True SRI portfolio deviated the most from the conventional portfolio in several areas. However, there is no statistically significant proof that it outperforms the conventional portfolio. The findings of this study challenge the existing literature which do not find any differences between SRI funds and conventional funds when it comes to risk and return.

When breaking down the SRI funds further into regional categories the models lose

explanatory power. In addition, it appears that the regional investment universe highly impact the behavior of the funds. Consequently, one should proceed with caution when drawing inferences from the regional results.

In conclusion, SRI funds appears to be riskier than conventional funds and compensate the increased risk with higher returns. When considering risk-adjusted return measures and reward-to-risk ratios, there is some evidence that suggests that funds that excludes sin industries outperform the market and conventional funds. These findings question the previous literature that has not considered different types of SRI strategies when evaluating SRI fund performance.

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## 8 Appendix A: The SRI profile information template

## Hållbarhetsprofilen (Swesif's sustainability declaration for funds)

- The instructions for completing Hållbarhetsprofilen are in red, and are not visible to the reader in the published version.
- In order to avoid lengthy descriptions, the comments fields are limited to 300 characters.

**Fund name and fund company's logo**

Last updated 20XX-XX-XX

### Fund description

[Give a brief description of the fund and its composition, e.g. if the fund is sector-specific or region-specific.]

### Inclusion

#### Proactive sustainability analysis

[If the fund uses a proactive approach to sustainability analysis of investments, select one of the following three alternatives below. If not applicable, leave the fields empty.]

- ☐ Sustainability issues are key to the fund manager's investment selection  
*The fund has specific and communicated criteria for selecting investments with regards to environmental, social and business ethics issues. An analysis of the companies' sustainability performance is crucial to the choice of investments in the fund.*

[This alternative is for funds that have specific and communicated criteria for the inclusion of companies based on their proactive work and good results regarding environmental, social and business ethical issues. The sustainability analysis has a considerable impact on the fund's investments. This refers both to fundamental and quant-based strategies with sustainability as a base.]

Fund company's comments:

- ☐ The fund manager takes sustainability into consideration  
*Sustainability is taken into account when analysing financial data on companies and when making investment decisions, which affects which underlying companies chosen for the fund but is not a decisive factor.*

[This alternative refers to funds that clearly support and systematically integrate sustainability in economic analyses and investment decisions. Sustainability is a clearly defined part of the investment process, is analysed on a continual basis and affects the fund's investments.]

Fund company's comments:

- ☐ The fund manager has access to sustainability analysis  
*The fund manager has access to company-specific sustainability analysis, which in some cases can have an impact on which companies are picked for the fund.*

[This alternative is for funds that have begun an integration of sustainability issues but where the analysis is not yet applied systematically.]

Fund company's comments:

#### Thematic strategy

- ☐ The fund picks investments based on a defined sustainability theme (e.g. climate, water, environmental technology, social responsibility).

[This alternative is for funds that only invest in accordance with themes or assets that support a sustainable development. Theme funds focus on specific issues related to sustainability, e.g. environmental technology. Please note that this section refers to themes that specifically support sustainable development. Other thematic strategies should be described in the fund fact sheet.]

Fund company's comments:

### Impact investing

- ☐ The fund invests only in projects or businesses with measurable positive social and/or environmental effects.

[This alternative is for funds that only invest in projects or businesses with measurable positive social and/or environmental effects, as well as delivering a financial return on investment, so-called impact investing.]

Fund company's comments:

### Other criteria

- ☐ Other criteria that refer to the environment, human rights, labour rights and business ethics that are applicable to the fund.

[Specify any other sustainability criteria applicable to the fund.]

Fund company's comments:

### Exclusion

*The fund does not invest in companies that are involved in the following: The accepted percentage of the company's turnover in a product or service is specified below.*

#### Product and service sectors

- ☐ Cluster bombs, personnel mines \_\_\_\_\_%  
Fund company's comment:

- ☐ Chemical and biological weapons \_\_\_\_\_%  
Fund company's comment:

- ☐ Nuclear weapons \_\_\_\_\_%  
Fund company's comment:

- ☐ Weapons and/or ordnance \_\_\_\_\_%  
Fund company's manager's comment:

- ☐ Alcohol \_\_\_\_\_%  
Fund company's comment:

- ☐ Tobacco \_\_\_\_\_%  
Fund company's comment:

- ☐ Commercial gambling \_\_\_\_\_%  
Fund company's comment:

- ☐ Pornography \_\_\_\_\_%  
Fund company's comment:

- ☐ Fossil fuels (oil, gas, coal) \_\_\_\_\_%  
Fund company's comment:

- ☐ Coal \_\_\_\_\_%  
Fund company's comment:

#### International conventions

The fund avoids investments in companies that violate international norms and conventions related to the environment, human rights, labour rights and business ethics, e.g. FNs Global Compact and the OECD guidelines for multinational companies.

[This alternative refers to funds that apply a reactive sustainability analysis and exclude companies that violate international conventions. Choose one of the two alternatives below, depending on the scope of the exclusions.]

**Solely screening for norm violations – which do not lead to exclusions – is not sufficient for choosing either of these alternatives.**

- ☐ The fund rejects all identified companies that do not adhere to international conventions.  
Fund company's comments:
- ☐ The fund does not invest in companies that do not show a willingness to comply or where the fund deems that the companies are not likely to address problematic issues within an acceptable amount of time.  
Fund company's comments:

#### **Countries**

- ☐ For reasons related to sustainability, the fund does not invest in companies with business in certain countries/interest-bearing securities issued by certain countries.  
[This alternative refers to funds that are subject to a country-specific sustainability analysis, which may result in the exclusion of certain investments on the basis of the country of operations and/or because of investments into securities issued by certain countries. Specify to which countries exclusions apply and the reason for exclusion. Note that only country analysis related to specific sustainability issues are referred to here. Geographical restrictions based on other criteria, e.g. the fund's geographical split, are not grounds for selecting this alternative.]  
Fund company's comments:

#### **Other Criteria**

- ☐ **Other**  
Fund company's comments:  
[Specify any additional criteria for exclusion]

#### **Fund company engagement**

*The fund company uses its mandate as asset owner to engage in companies regarding sustainability issues. Please note that engagement is carried out for all of the fund company's holdings, not specifically for this fund.*

[Note that engagement should be relevant for the fund in question in order for the fund company to choose this alternative. The fund's investment universe should be affected by the engagement work.]

The fund company is in dialogue with companies in order to influence them in a more sustainable direction.

- ☐ Own engagement  
Fund company's comments:
- ☐ Engagement in cooperation with other investors  
Fund company's comments:
- ☐ Engagement via external suppliers/consultants  
Fund company's comments:
- ☐ Voting at Annual General Meetings  
Fund company's comments:
- ☐ Participates in election committees to impact the composition of the Board of Directors  
Fund company's comments:
- ☐ Other engagement activities  
Fund company's comments:  
[Specify]

## Resources

*Resources for analysis, follow-up and control*

- ☐ The fund uses in-house resources for sustainability analysis and engagement.  
Fund company's comments:  
[Specify scope of the resources and which assignments are handled internally]
- ☐ The fund uses external resources for sustainability analysis and engagement.  
Fund company's comments:  
[Specify scope of the resources and which assignments are handled externally]
- ☐ Other  
Fund company's comments:  
[Specify]

## Additional information

- ☐ The fund's investments are published on the fund company's website.  
Fund company's comments:  
[Link to relevant page and specify frequency of updates]
- ☐ The fund's carbon footprint assessment is published annually on the fund company's website.  
Fund company's comments:  
[Link to the assessment]
- ☐ The fund manager publishes which companies are excluded from investment, based on sustainability criteria.  
Fund company's comments:  
[Link to list of excluded companies]
- ☐ Fund manager publishes an annual sustainability report.  
Fund company's comments:  
[Link to the report]
- ☐ Fund manager publishes "Fondbolagens Förening"'s sustainability review.  
Fund company's comments:  
[Link to the report]
- ☐ Other  
Fund company's comments:

The fund company is responsible for ensuring that the information in Hållbarhetsprofilen is correct and is reviewed and updated at least annually. For more information on the fund's sustainability work, please contact the fund company.

Contact details: [Specify website and contact details]

For more information about Swesif, please contact Swesif's administration office. Contact details are available on [www.swesif.org](http://www.swesif.org).

Hållbarhetsprofilen is a form for sustainability-related information in order to improve access to information on the fund's sustainability issues and focus and to enable customers to make fund comparisons. The information in Hållbarhetsprofilen is provided and presented by the fund companies.

The fund companies ensure that the information complies with Swesif's guidelines and that all information is correct and is updated at least once a year.

- ☒ I hereby confirm that the details given are correct and comply with Swesif's guidelines for Hållbarhetsprofilen. I commit to updating Hållbarhetsprofilen at least once a year, as well as whenever any changes occur in the content or application of the fund's sustainability criteria.

## 9 Appendix B: Fund sample

Table 15: Conventional funds

AKTIESPARARNA TOPP SVERIGE	NAVIGERA AKTIE 1
ALFA AKTIV	NAVIGERA TILLVAXT 1
AVANZA ZERO	NORDIC EQUITIES SWEDEN
CICERO CHINA INDEX A	NORDNET SUPERFONDEN SVERIGE
CICERO EMERGING MARKETS INDEX A	PACIFIC EXPLORER DYNAMIC A
COELI OFFENSIV SUSP	PACIFIC EXTRAORDINARY BRANDS A
GRANIT SMABOLAG	PACIFIC GLOBAL DYNAMIC
HUMLE FOND SELECT	PANDIUM GLOBAL
HUMLE SMABOLAGSFOND	PROXY PETROLEUM ENERGY
IKC ASIEN A	QUESADA GLOBAL
IKC FILIPPINERNA A	QUESADA SVERIGE
IKC GLOBAL HEALTHCARE A	SEB SVERIGE INDEXFOND P
IKC GLOBAL INFRASTRUCTURE A	SOLIDAR FONDER FLEX 100 A
IKC OPPORTUNITIES A	SPILTAN AKTIEFOND INVESTMENTBOLAG
IKC PENSION VARIABEL	SPILTAN GLOBALFOND INVESTMENT
INSIDE ACTIVE GLOBAL	STRAND SMABOLAGSFOND
INSIDE AUSTRALIA	STRATEGI TILLVAXT
INSIDE CANADA	STRATEGI VARLDEN
LANCELOT AVALON	TELLUS INVESTMENTBOLAG
LANCELOT CAMELOT A	VIKING FONDER SVERIGE B

Names in Datastream.

Table 16: SRI funds

AKTIE-ANSVAR EUROPA	OHMAN SVERIGE SMART BETA
AKTIE-ANSVAR SVERIGE A	OPM GLOBAL QUALITY COMPANIES A
ALFRED BERG HALLBAR TILLVAXT SVERIGE A	OPM LISTED PRIVATE EQUITY
ALFRED BERG RYSSLAND	PRIOR NILSSON REALINVEST A-KLASS
ALFRED BERG SVERIGE PLUS A	PRIOR NILSSON SVERIGE AKTIV A-KLASS
AMF AKTIEFOND MIX	SEB ASIENFOND EX JAPAN
AMF ASIEN STILLA HAVET PN.	SEB ASSET MANAGEMENT AKTIESPAR
AMF EUROLAND PN	SEB ASSET MANAGEMENT EMERGING MARKETS
AMF GLOBAL PN	SEB ASSET MANAGEMENT EUROPA
AMF NORDAMERIKA PN	SEB ASSET MANAGEMENT FASTIGHETS
AMF SMABOLAG PN	SEB ASSET MANAGEMENT LAKEMEDEL
AMF SVERIGE PN	SEB ASSET MANAGEMENT LATINAMERIKA
AMF VARLDEN PN	SEB ASSET MANAGEMENT NORDAMERIKA
AP7 AKTIEFOND	SEB ASSET MANAGEMENT NORDEN
CARNEGIE ASIA	SEB ASSET MANAGEMENT OSTEUROPA
CARNEGIE RYSSLANDSFOND	SEB ASSET MANAGEMENT SCHWEIZ



**Table 16 – continued from previous page**

CARNEGIE SMABOLAGSFOND	SEB ASSET MANAGEMENT STIFTELSE SVERIGE
CATELLA SMABOLAGSFOND	SEB ASSET MANAGEMENT STIFTELSE UTLAND
CATELLA SVERIGE AKTIV HALLBARHET	SEB ASSET MANAGEMENT TEKNOLOGI
CATELLA SVERIGE INDEX A	SEB DYNAMISK AKTIEFOND
CICERO FOCUS A	SEB EUROPAFOND SMABOLAG
CICERO VARLDEN A	SEB HALLBARHETSFOND GLOBAL
CLIENS SVERIGE A	SEB JAPANFOND
CLIENS SVERIGE FOKUS A	SEB NORDAMERIKAFOND SMA OCH MEDELSTORA BOLAG
DIDGER & GERGE SMABOLAG	SEB NORDAMERIKAFOND SMABOLAG
DIDNER & GERGE AKTIEFOND	SEB SWEDISH VALUE FUND UTD
DIDNER & GERGE GLOBAL	SEB SVERIGE EXPANDERAD
DIDNER & GERGE SMALL AND MICROCAP	SEB SVERIGEFOND SMABOLAG CHANS/RISK UTD
EAST CAPITAL BALKANFONDEN	SEB SVERIGEFOND SMABOLAG P
EAST CAPITAL BALTIC SEK	SEB WWF NORDENFOND
EAST CAPITAL EASTERN EUROPE SEK	SIMPLICITY AB AFRIKA
EAST CAPITAL RUSSIA SEK	SIMPLICITY AB ASIEN
EAST CAPITAL TURKIETFONDEN	SIMPLICITY AB INDIEN
ENTER SMABOLAGSFOND A	SIMPLICITY AB KINA
ENTERKAPITAL ENTER SELECT	SIMPLICITY AB NORDEN FD.
ENTERKAPITAL ENTER SELECT PRO	SIMPLICITY EUROPA
ENTERKAPITAL ENTER SVERIGE	SIMPLICITY SMABOLAG SVERIGE A
ENTERKAPITAL ENTER SVERIGE FOKUS	SIMPLICITY SVERIGE
GODFOND I SVERIGE AB VARLDEN	SKANDIA ASIEN
HANDELSBANKEN AMERIKA TEMA	SKANDIA EUROPA EXPONERING
HANDELSBANKEN ASIEN TEMA	SKANDIA FONDER AB IDEER FOR LIVET
HANDELSBANKEN ASTRA ZENECA ALLEMANSFOND	SKANDIA FONDER AB SF CANCERFONDEN
HANDELSBANKEN EUROPA SELEKTIV	SKANDIA FONDER AB SF SMABOLAG SVERIGE
HANDELSBANKEN EUROPA TEMA	SKANDIA FONDER AB SF SVERIGE
HANDELSBANKEN GLOBAL TEMA	SKANDIA FONDER AB SF USA
HANDELSBANKEN HALLBAR ENERGI	SKANDIA FONDER AB SF VARLDEN
HANDELSBANKEN JAPAN TEMA	SKANDIA FONDER AB SF VARLDSNATURFONDEN
HANDELSBANKEN LAKEMEDELFSFOND	SKANDIA GLOBAL EXPONERING A
HANDELSBANKEN LATINAMERIKAFOND	SKANDIA JAPAN EXPONERING
HANDELSBANKEN MULTI ASSET 100	SKANDIA NORDAMERIKA EXPONERING
HANDELSBANKEN NORDEN SELEKTIV	SKANDIA NORDEN
HANDELSBANKEN NORDENFOND	SKANDIA SMART OFFENSIV
HANDELSBANKEN NORDISKA SMABOLAGSFOND	SKANDIA SVERIGE EXPONERING
HANDELSBANKEN SVENSKA SMABOLAGSFOND	SKANDIA TILLVAXTMARKNADSFOND
HANDELSBANKEN SVERIGE INDEX CRITERIA	SOLIDAR AGGRESSIV PLUS
HANDELSBANKEN SVERIGE OMXSB INDEX	SOLIDAR ETISK PLUS
HANDELSBANKEN SVERIGE SELEKTIV (A1)	SOLIDAR FLEX 100 PLUS
HANDELSBANKEN SVERIGEFOND	SOLIDAR SPAR 100
HANDELSBANKEN SVERIGEFOND INDEX	SOLIDAR SPAR AGGRESSIV
HANDELSBANKENS EUROPAFOND IDX	SOLIDAR SPAR ETISK
HANDELSBANKENS FINLANDSFOND	SPILTAN AKTIEFOND DALARNA
HANDELSBANKENS KINAFOND	SPILTAN AKTIEFOND SMALAND
HANDELSBANKENS OSTEUROPAFOND	SPILTAN AKTIEFOND STABIL

**Table 16 – continued from previous page**

HANDELSBANKENS TILLVAXTMARK	SPILTAN AKTIEFOND SVERIGE
HEALTH INVEST SMALL & MICRO CAP FUND A	SPP AKTIEFOND EUROPA
HEALTH INVEST VALUE FUND A	SPP AKTIEFOND GLOBAL A
ICA BANKEN MODIG	SPP AKTIEFOND JAPAN
IKC GLOBAL BRAND A	SPP AKTIEFOND STABIL A
INDECAP GUIDE GLOBAL A	SPP AKTIEFOND SVERIGE A
INDECAP GUIDE SVERIGE A	SPP AKTIEFOND USA
INDECAP GUIDE TILLVAXTMARKNADSFOND A	SPP EMERGING MARKETS SRI
LANNEBO EUROPA SMABOLAG A SEK	SPP GLOBAL PLUS A
LANNEBO FONDER SVERIGE	SPP GLOBAL TOPP 100
LANNEBO FONDER VISION	SPP MIX 100
LANNEBO SMABOLAG SEK	SPP SVERIGE PLUS A
LANNEBO SMABOLAG SELECT	SPP TILLVAXTMARKNAD PLUS A
LANNEBO SVERIGE FLEXIBEL	SWEDBANK ROBUR ACCESS ASIEN
LANNEBO SVERIGE PLUS	SWEDBANK ROBUR ACCESS EUROPA
LANNEBO UTDELNINGSFOND	SWEDBANK ROBUR ACCESS GLOBAL
LANSFORSAKRINGAR ASIENFOND A	SWEDBANK ROBUR ACCESS JAPAN
LANSFORSAKRINGAR EUROPA AKTIV A	SWEDBANK ROBUR ACCESS SVERIGE
LANSFORSAKRINGAR EUROPA INDEXNARA	SWEDBANK ROBUR ACCESS USA
LANSFORSAKRINGAR GLOBAL HALLBAR A	SWEDBANK ROBUR AKTIEFOND PENSION
LANSFORSAKRINGAR GLOBAL INDEXNARA	SWEDBANK ROBUR ALLEMANSFOND IV
LANSFORSAKRINGAR SMABOLAG SVERIGE A	SWEDBANK ROBUR AMERIKAFOND
LANSFORSAKRINGAR SVERIGE AKTIV A	SWEDBANK ROBUR BAS AKTIER
LANSFORSAKRINGAR SVERIGE INDEXNARA	SWEDBANK ROBUR ETHICA GLOBAL
LANSFORSAKRINGAR TILLVAXTMARKNAD AKTIV A	SWEDBANK ROBUR ETHICA GLOBAL MEGA
LANSFORSAKRINGAR TILLVAXTMARKNAD INDEX	SWEDBANK ROBUR ETHICA SVERIGE MEGA
LANSFORSAKRINGAR USA AKTIV A	SWEDBANK ROBUR EUROPAFOND
LANSFORSAKRINGAR USA INDEXNARA	SWEDBANK ROBUR EUROPAFOND MEGA
NORDEA ALFA	SWEDBANK ROBUR EXPORTFOND
NORDEA INDEXFOND SVERIGE ICKE-UTD	SWEDBANK ROBUR GLOBAL HIGH DIVIDEND
NORDEA INST AKTIEF SVERIGE ICKE-UTD	SWEDBANK ROBUR GLOBALFOND MEGA
NORDEA INST AKTIEFONDEN STABIL ICKE-UTD	SWEDBANK ROBUR JAPANFOND
NORDEA INST AKTIEFONDEN VARLDEN UTD	SWEDBANK ROBUR KAPITALINVEST
NORDEA LATINAMERIKAFOND	SWEDBANK ROBUR KINAFOND
NORDEA OLYMPIAFOND	SWEDBANK ROBUR MEDICA
NORDEA SMABOLAGSFOND SVERIGE	SWEDBANK ROBUR NORDENFOND
NORDEA STRATEGA 100	SWEDBANK ROBUR OSTEUROPAFOND
NORDEA SWEDISH STARS ICKE-UTD	SWEDBANK ROBUR PREMIUM OFFENSIV
OHMAN ETISK EMERGING MARKETS	SWEDBANK ROBUR RAVARUFOND
OHMAN ETISK GLOBAL A	SWEDBANK ROBUR REALINVEST
OHMAN ETISK INDEX EUROPA	SWEDBANK ROBUR RYSSLANDSFOND
OHMAN ETISK INDEX JAPAN	SWEDBANK ROBUR SMABOLAGS NORDEN
OHMAN ETISK INDEX PACIFIC	SWEDBANK ROBUR SMABOLAGSFOND EUROPA
OHMAN ETISK INDEX SVERIGE A	SWEDBANK ROBUR SMABOLAGSFOND GLOBAL
OHMAN ETISK INDEX USA A	SWEDBANK ROBUR SMABOLAGSFOND SVERIGE
OHMAN GLOBAL GROWTH	SWEDBANK ROBUR SVERIGEFOND
OHMAN GLOBAL HALLBAR A	SWEDBANK ROBUR SVERIGEFOND MEGA

**Table 16 – continued from previous page**

OHMAN HJART-LUNGFONDEN	SWEDBANK ROBUR TALENTEN AKTIE MEGA
OHMAN SMABOLAGSFOND A	TUNDRA FRONTIER AFRICA FUND
OHMAN SWEDEN MICRO CAP	TUNDRA PAKISTAN FUND A (SEK)
OHMAN SVERIGE HALLBAR A	

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Names in Datastream.