

Evaluating the Performance of Socially Responsible Investment Funds: A Holding Data Analysis

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Abstract: This paper investigates the performance of regular mutual funds compared to Socially Responsible Investment (SRI) mutual funds, over the time period of January 2001 to September 2007. The paper extends the research on the performance of SRI funds by using holding data of regular funds to create replicating portfolios. In the replicating portfolios, unethical investments are excluded according to a norm-based screening list, hence creating artificial SRI funds. The replicating portfolio returns are then used as a benchmark to compare against the SRI funds' and regular funds' returns. Results from the study indicate that an exclusion of companies according to norm-based screening can improve a fund's performance. However, when looking specifically at the fund management of SRI funds, the results point towards inferior performance compared to regular funds.

Key Words: Socially Responsible Investment (SRI) funds, ethical investments, holding data analysis, norm-based screening

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Presentation: 13:15-15:00, December 14, 2007
Venue: Room 349, Stockholm School of Economics

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ACKNOWLEDGEMENTS

Special thanks to tutor PhD Stefan Engström for all support and guidance.

Thank you for providing your time and expertise to make this study possible.

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1. INTRODUCTION

Investing in Socially Responsible Investment (SRI) funds has lately become increasingly popular. In relation to this a number of questions have been raised: Why are investors interested in these types of investments? Can socially responsible practices create value? If not, are these investors willing to accept a trade-off in returns in exchange for socially responsible holdings? What do they get for their money? The previous literature on this topic has to a large extent focused on investigating if fund performance can be improved by investing in socially responsible companies. Most of the studies find neither a positive nor a negative effect on fund returns. To increase the understanding of SRI fund performance, these questions need to be investigated further.

There has been considerable research within the SRI fund performance field. Previous research has primarily focused on the US and UK markets due to better data availability. Only a limited number of studies have been performed on the Swedish market. Recent research by Kreander et al. (2005), Gregory and Whittaker (2007) and Bauer et al. (2007) show that there is no significant difference between the SRI funds' and regular funds' performance. In this research the empirical link between socially responsible practices and financial performance has been tested by comparing historical returns of SRI funds to regular funds and/or a market index. In the studies, fund management is assumed to be equally good/bad across the SRI funds and regular funds. However, as fund performance is a combination of firm level performance and fund management performance, these papers cannot give a more detailed explanation of fund performance. White (1991) and White (1996) argue that fund performance might have more to do with the fund managers' ability than the firm level performance.

There are two aims with this thesis. As there has been no exhaustive study on the Swedish market, the first aim is to compare mutual fund performance between SRI funds and regular funds in line with previous research. The second aim is to decompose 'fund performance' into the two components: (i) firm level performance and (ii) fund management performance, to understand how they affect overall fund performance of SRI funds.

In this study, we develop the method of evaluating SRI funds by analyzing both the performance of socially responsible companies and socially responsible fund managers. First of all, in line with previous research, SRI funds and regular funds are compared directly to each other.

Secondly, replicating portfolios are created for the regular funds where unethical investments are excluded according to a norm-based screening¹. Hence, artificial SRI funds are constructed which enables the examination of what regular funds performances would have been, if they would have invested socially responsibly. There are a number of advantages with applying this new method. First of all, the replicating portfolios become a perfect SRI benchmark to compare the regular funds with. As fund management is held constant, differences can be attributed to firm level performance. Thirdly, in contrast to previous studies, the fund management component can be isolated to a larger extent, enabling the comparison of performance of regular fund managers to SRI fund managers.

An additional advantage of this study is the encompassing dataset that has been collected. The sample of funds consists of 23 SRI funds and 42 regular funds. By investigating Swedish registered funds, quarterly holding data could be retrieved through Finansinspektionen, the Swedish Financial Supervisory Authority. We were also granted access to a norm-based screening list, provided by Ethix SRI Advisors².

The results from this study show that on an overall fund performance level, SRI funds do not perform as well as regular funds. When examining the underlying components of fund performance on the other hand, evidence show that the replicating portfolios perform better than the regular funds, suggesting that certain socially responsible practices affect firm level performance positively. On a fund management level, the results indicate that the fund management of regular funds is better than for SRI funds.

This paper is organized as follows. First of all, section 2 gives an overview of the SRI fund industry. In section 3, relevant theories are presented along with the hypotheses. Previous literature on SRI fund performance is reviewed in section 4 and section 5 outlines the chosen dataset and method. The results are presented in section 6, discussed in section 7 and concluded in the final section.

¹ Norm-based screening or normative screening is a form of research in which companies' compliance with international standards, set by organizations such as the UN, UNICEF, and ILO, is investigated. The information regarding the companies' violations is then used to compile a list of companies recommended to be divested.

² In Ethix's Norm-Based Screening© database there is research on more than 7,000 companies and according to the European Social Investment Forum (Eurosif, 2006), it is the most extensive SRI database of this type available.

2. SOCIALLY RESPONSIBLE INVESTING

There are many ways of interpreting the term Socially Responsible Investment fund. In this study, SRI funds will be defined as funds that have a limitation on their investment universe by the application of social, environmental or ethical criteria, in line with previous research by Mallin et al. (1995). Another term that is often mentioned in relation to the SRI industry is Corporate Social Responsibility (CSR). The SRI fund industry is regarded as a component of the overall CSR agenda. As with SRI, there are many interpretations of the CSR term, but in this paper it will be defined according to the European Commission's (2001) definition: "a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis".

To enable a better understanding of this paper, a brief overview of the industry background and SRI screening process will be presented in this chapter.

2.1 Industry background

The SRI fund industry in Sweden has approximately 122 SEK billion under management (Lundberg and Westholm, 2006). In this study, the number of SRI funds marketed in Sweden has been assessed to 137 funds, out of which 79 are registered in Sweden. The market has grown during the last couple of years; in 2005 SRI fund investments represented 4% of the fund market while it was 11% in 2006 (Lundberg and Westholm, 2006). Similar growth has also been observed in several other markets. The US SRI fund investments have almost quadrupled the last couple of years, increasing from 689 USD billion in 1995 to 2.3 USD trillion in 2005 (Social Investment Forum, 2005).

The first Swedish SRI fund Aktie Ansvar Myrberg, launched in 1965, was also the first European SRI fund available to all investors. The sector remained small in both the US and in Europe until the 1980s (Kreander, 2001). Today, the largest markets in Europe are the UK, France, Italy and Sweden (Lundberg and Westholm, 2006). Traditionally, however, the US has always been the largest market. The growth of the sector has mainly been driven by the increasing awareness of social, environmental and ethical issues by investors, companies, governments, activists and the media. Institutional investors have played an in particular important role in driving demand in Sweden as they represent a vast majority of the investors

(Eurosif, 2006). Additional information on the SRI industry can be found in, among other, Kreander (2001), Louche and Lydenburg (2006) and Eurosif (2006).

2.2 SRI screening

The SRI screening industry has developed in parallel with the increased focus on CSR practices. There has been a need for additional information to improve the decision process of which companies to invest in. SRI researchers provide screening or rating of companies which is used to rank companies based on their socially responsible practices. SRI research is done internally at fund managers as well as externally by ethical screening firms³. Fund managers usually apply a unique mix of different screening methods to exclude or include companies from their investment universes. The European Social Investment Forum, a non-profit organization focusing on SRI investments, classifies the screening methods into three overall categories (Eurosif, 2006):

- (i) *Negative screening* generally excludes companies based on their involvement in certain industries or practices. The most common industries are alcohol, tobacco, and weapons. Another type of negative screening is the *norm-based screening* which primarily excludes companies based on violations of international standards and conventions, e.g. the United Nations Universal Declaration of Human Rights, UNICEF Convention on the Rights of the Child, and the ILO Labor Standards.
- (ii) *Positive screening* includes companies that enhance or are committed to having a positive impact on SRI practices. Only if the companies fulfill the criteria set by the SRI researchers can they be included in the fund. Another type of positive screening is *best-in-class screening* which seeks to invest in the leading companies on SRI issues within their industry.
- (iii) *Engagement* is a method for fund managers to educate and influence their holdings' SRI practices. This is usually done via a direct dialogue with the company or by using their shareholder votes.

³ The main screening companies active on the Swedish market include Stockholm based Ethix SRI Advisors and GES Investment Services as well as London based Innovest Group.

3. THEORETHICAL FOUNDATION AND HYPOTHESES

This section introduces theory which argues that performance could differ between SRI funds and regular funds. The performance of a fund can be divided into two dimensions: (i) performance related to the companies included in the portfolio and (ii) fund manager related performance. Following the discussion of theory, divided into these two dimensions, the hypotheses of the thesis will be presented.

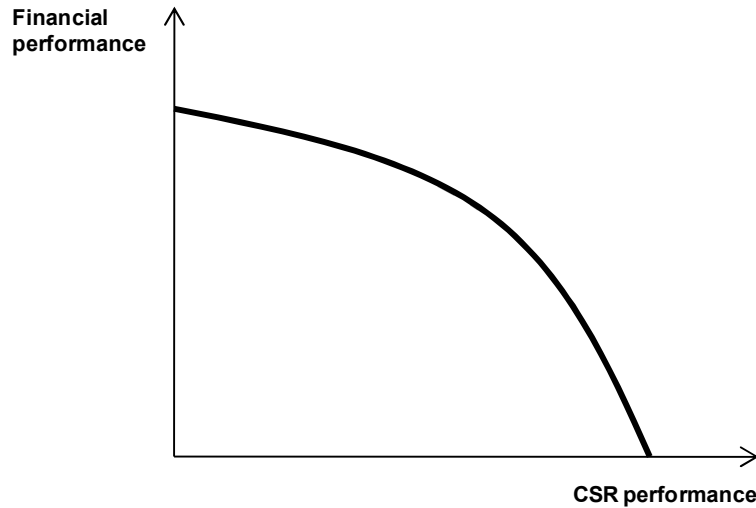
3.1 *Theoretical foundation – Firm level*

The theoretical discussion regarding fund performance at the firm level is part of the debate regarding the relationship between corporate social responsibility performance and financial performance. There are two main schools of thought within this area: the cost-concerned school which supports a negative relationship and the value creation school which supports a positive relationship (Hassel et al., 2005). These perspectives represent the two extremes of the spectrum.

3.1.1. *Negative relationship “The cost-concerned school”*

The cost-concerned school has its foundation in the neoclassical view of economics. It builds on Adam Smith’s (1776) theories that the “invisible hand” will ensure socially optimal solutions in the marketplace. As this has been one of the most influential perspectives of economics, it has for a long time been the main way of interpreting the relationship of CSR and financial performance. The central argument of the cost-concerned school is that there is a trade-off between CSR performance and financial performance (Walley and Whitehead, 1994). Companies which decide to reduce socially harmful practices such as pollution will, thus, incur higher costs and the bottom line will thereby be affected negatively. The relationship between CSR performance and financial performance is argued to be negative, as pictured in figure 1 below (Wagner, 2001).

Figure 1. Negative relationship between CSR performance and financial performance



Milton Friedman has been one of the most influential economists in the cost-concerned school. He argued that companies should not engage in socially responsible practices as it is not in the interest of the shareholders:

There is one and only one social responsibility of business - to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition without deception or fraud (Friedman, 1962).

He claimed that CSR practices often are on a voluntary basis which do not follow the market logic and are therefore not necessarily beneficial for the participants. If the socially responsible practices would increase the companies' profitability, they would already have been implemented. As a consequence, CSR could, from the shareholder perspective, be viewed as actions on the verge of fraud (Friedman, 1970).

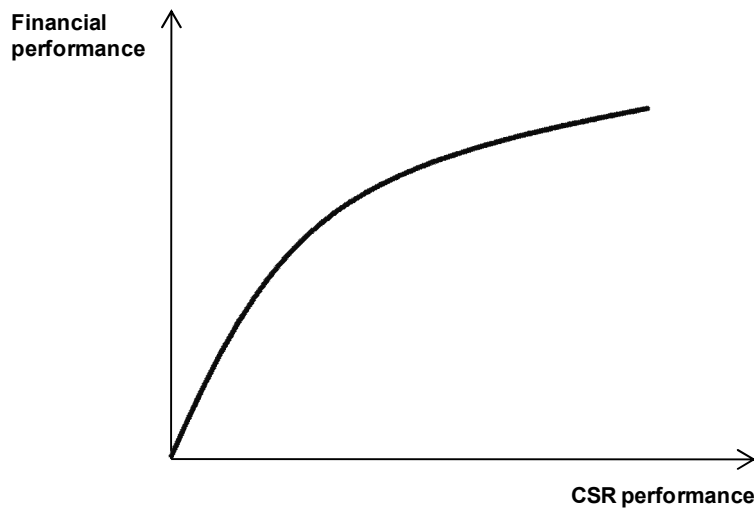
Other authors that have argued that the relationship is negative are Walley and Whitehead (1994). They state that the gains from changing to environmentally friendly solutions are so small that they become insignificant in relation to the massive compliance costs. These solutions should therefore not be the goal of any company. As an example, they point to the large costs⁴ for petroleum refiners associated with the Clean Air Act that was re-authorized in the US in 1994.

⁴ Estimated to 37 USD billion, 6 USD billion higher than the book value of the petroleum refining industry.

3.1.2. Positive relationship “The value creation school”

The negative relationship suggested by the cost-concerned school, has more recently been questioned. In the value creation school it is argued that the competitive advantage increases with CSR investments if applied in the right way. By being forced to approach business and innovation in a new way, development of new technologies will be spurred which leads to competitive advantages (Porter and van der Linde, 1995). The relationship between corporate social responsibility and financial performance is therefore argued to be positive as depicted in figure 2 below (Wagner, 2001).

Figure 2. Positive relationship between CSR performance and financial performance



One of the most influential economists in the value creation school has been Michael Porter who has published a number of articles on the topic. In a recent article, written together with colleague Mark Kramer (2006), Porter emphasizes that it is in the interest of all companies to operate in a socially sound environment: “Any business that pursues its ends at the expense of the society in which it operates will find its success to be illusory and ultimately temporary”. Moreover, they argue that CSR activities can be valuable for a firm if applied in the right way. In response to proponents of the cost-concerned school, they explain that the problem with many firms’ CSR programs have been that the activities in many cases have been cosmetic and not properly in line with the companies’ strategies and line of business. These practices of “window

“greenwashing” have supported the previous notion that there exists a trade-off between financial performance and CSR activities. Some examples of companies that have aligned CSR with their operations are DuPont which have saved 2 USD billion in energy reductions since 1990 and McDonalds which reduced its solid waste with 30% by changing its wrapping material.

3.2 Theoretical foundation – Fund management level

The theoretical debate on fund management has focused on fund managers’ skills, measured by stock picking and market timing ability (Engström, 2004). In the SRI fund research field, however, most studies have assumed fund management to be equally good/bad across the SRI funds and regular funds (Wagner, 2001). There is, therefore limited theory that covers fund management differences between SRI funds and regular funds. In most cases, the possible impact of fund management is discussed briefly in combination with the results. White (1991) reports that the fund performance differences observed in his research, between SRI funds and regular funds, may have more to do with the fund managers’ ability to pick stocks than the firm level performance. In a later study by White (1996), the same conclusion was made.

One could argue, in line with conventional portfolio theory, that SRI funds have higher exposure to diversifiable risk. As SRI fund managers exclude securities based on a SRI screening, they are presumed to be less diversified and therefore have a higher risk exposure compared to regular funds (Michelson et al., 2004). Additionally, Asmundson and Foerster (2001) state that there are administrative costs associated with selecting and monitoring stocks which would affect the SRI funds negatively.

3.3 Hypotheses

From the theoretical foundation, we can in combination with the aim of the paper derive the hypotheses. The first aim of the study is to compare the overall fund performance between SRI funds and regular funds, in line with previous research. Hypothesis I is thus:

Hypothesis I

H₀: SRI screening does not have an effect on the financial performance of mutual funds

H₁: SRI screening has a positive or negative (separated from zero) effect on the financial performance of mutual funds

However, as noted in the theoretical foundation; fund performance is compromised of the firm level performance and fund management performance. In line with the second aim; to decompose ‘fund performance’ and better understand its components, hypothesis II and III are derived.

Hypothesis II investigates the relationship between CSR performance and financial performance. If the replicating portfolios performances are inferior to the regular funds’, the results support the cost-concerned school and vice versa.

Hypothesis II

H₀: Socially responsible practices do not have an effect on financial performance of companies

H₁: Socially responsible practices on have a positive or negative (separated from zero) effect on financial performance of companies

Similarly, fund management is examined in hypothesis III by investigating if the fund management performance differs between the SRI funds and regular funds (replicating portfolios).

Hypothesis III

H₀: Fund management does not differ between SRI mutual funds and regular mutual funds

H₁: Fund management differs between SRI mutual funds and regular mutual funds

4. PREVIOUS RESEARCH

In this section, previous research on CSR performance will be discussed with a focus on SRI fund performance studies. A more detailed discussion of previous methods used when comparing SRI performance and financial performance of funds will also be presented.

4.1 CSR performance

A number of different methods have been applied to examine the relationship between CSR performance and financial performance. One of the key challenges within the research field has been to determine the proper method and data to use. McWilliams et al. (2006) point to a number of problems with CSR performance research; inconsistencies in defining CSR, measuring financial performance, selecting samples, as well as research design and misspecification of the models. As a result, a lot of research on CSR performance is not comparable.

Early studies in the research field of CSR in relation to financial performance were to a large extent event studies or regression analyses. Event studies measure the short-term positive or negative market reaction after a CSR related event while regression analyses employ a profitability measure, e.g. return on assets, to explain firm performance. Results from these early studies are varying; ranging from a negative to a positive relationship between CSR performance and financial performance (McWilliams et al., 2006).

4.2 SRI fund performance

Since the 1960s a relatively large amount of literature has been documented on the performance of SRI funds (Kreander et al., 2005). By comparing historical returns of SRI funds and regular funds and/or a market index, the empirical link between socially responsible practices and financial performance has been investigated. Previous literature has shown that SRI funds, on average, perform similarly to regular funds. A summary of relevant previous research is found in table 1 on the next page.

Table 1. Previous research on SRI fund performance

Year	Author(s)	Country	Fund sample	Time span	Method	Results	Relationship
1992	Luther et al.	UK	15 SRI funds	Start date or 1984-1990	Index benchmark	Weak support that SRI funds outperform the index	Positive
1993	Hamilton and Statman	US	17, 15 SRI funds; 170, 150 regular funds	1981-1985; 1986-1990	Constructed fund benchmark	On average, the SRI funds performed in line with the regular funds. Significant results	Neutral
1994	Luther and Matatko	UK	9 SRI funds	Start date or 1985-1992	Index benchmark	No significantly different performance between SRI funds and regular funds.	Neutral
1995	Mallin et al.	UK	29 SRI funds, 29 regular funds	1986-1993	Index benchmark, matched pair method	SRI funds, on average, outperform the regular funds	Positive
1997	Gregory et al.	UK	18 SRI funds, 18 regular funds	1986-1994	Index benchmark, matched pair method	SRI funds, on average, did not perform significantly different than the regular funds	Neutral
2000	Kreander et al.	Belgium, Germany, Netherlands, Norway, Sweden, Switzerland, UK	40 SRI funds, 40 regular funds	1996-1998	Index benchmark, matched pair method	On average, the SRI funds gave the same returns as regular funds	Neutral
2000	Statman	US	31 SRI funds, 62 regular funds	1990-1998	Index benchmark, matched pair method	No significant difference in performance between SRI funds and regular funds	Neutral
2000	Naturvårdsverket	Norway, Sweden	12 SRI funds	Start date-2000	Index benchmark	Environmental funds did, on average, not perform different than regular funds	Neutral
2001	Asmundson and Foerster	Canada	6 SRI funds	1995-1999, 1990-1999	Index benchmark	No significant difference was observed between SRI funds and regular funds	Neutral
2001	Naturvårdsverket	Norway, Sweden	13 SRI funds, 13 regular funds	Start date-2000; 1997-2000	Index benchmark, matched pair method	On average, the environmental funds performed in line with the regular funds	Neutral
2004	Schröder	Germany, Switzerland, US	24 SRI funds	Start date-2002	Index benchmark	On average, SRI funds have a similar performance as regular funds	Neutral
2005	Bauer et al.	German, UK, US	103 SRI funds, 4,384 regular funds	1990-2001	Index benchmark, matched pair method	No statistically significant difference between SRI funds and regular funds was found	Neutral
2005	Geczy et al.	US	34 SRI funds, 894 regular funds	1963-2001	Index benchmark, constructed fund benchmark	SRI funds perform statistically significant different from regular funds	Negative
2005	Kreander et al.	Germany, Netherlands, Sweden, UK	30 SRI funds, 30 regular funds	1995-2001	Index benchmark, matched pair method	On average, no significant difference between SRI funds and regular funds	Neutral
2007	Bauer et al.	Canada	8 SRI funds, 267 regular funds	1994-2003	Index benchmark, constructed fund benchmark	No significant difference in performance between SRI funds and regular funds was found	Neutral
2007	Gregory and Whittaker	UK	32 SRI funds, 160 regular funds	1989-2002	Index benchmark, matched pair method	On average, there is no difference in performance between SRI funds and regular funds	Neutral

Previous research has primarily focused on the US and UK markets where there historically has been relatively more data available (Wagner, 2001). The studies employ a variety of benchmarks and methods. The question of the appropriate benchmark is often raised and is still a problem within the SRI fund performance field (Bauer et al., 2007). Most research applies some type of index benchmark in combination with a regular fund benchmark.

There are two different ways of comparing SRI funds with regular funds. First of all, the matched pair method matches the SRI fund with one or more regular funds to control for factors like fund size and start date. Another method of comparing SRI funds' to regular funds' performances is through a constructed fund benchmark. In this method, portfolios of funds are created and then compared on an aggregate level. One selects certain criteria for funds which are to be included in the sample to make sure that the only difference between the groups is the investigated variable, e.g. SRI screening. We have chosen to use the constructed fund benchmark as it gives a greater flexibility when selecting the sample of funds. In a small market like the Swedish, it otherwise becomes difficult to get a large enough sample. For constructed fund benchmarks, selection criteria can for example be equity orientation, as in Bauer et al. (2007) where 8 SRI funds and 267 regular funds were selected.

5. DATA AND METHOD

The performance analysis conducted in this study applies a slightly different method of comparison than the ones described in the previous section. In addition to directly comparing regular funds to SRI funds, replicating portfolios are constructed of the regular funds. In the replicating portfolios, a number of holdings are excluded based on norm-based screening. The objective of constructing these replicating portfolios is to create a control group where it is possible to investigate what the performance would have been if the regular funds had invested socially responsibly. In this chapter, the construction of the replicating portfolios is explained in detail, together with the process of performance testing and data selection.

To test the three hypotheses mentioned in section 3.3, data has been collected for 42 regular funds and 23 funds with a SRI profile. To investigate the hypotheses, in total, three groups of funds are compared: (i) SRI mutual funds (ii) regular mutual funds and (iii) replicating portfolios of regular mutual funds.

Table 2. Overview of tests

	Area of investigation	Comparison groups
Hypothesis I	Overall performance	(ii) Regular funds vs. (i) SRI funds
Hypothesis II	Firm level performance	(ii) Regular funds vs. (iii) replicating portfolios of regular funds
Hypothesis III	Fund management performance	(iii) Replicating portfolios of regular funds vs. (i) SRI funds

5.1 Data

The criteria set up to select the funds, index benchmarks, and SRI screening are described in detail in the subsequent sections. In total the data sample of returns for the funds, indexes and interest rates, consists of more than 9,000 data points.

5.1.1. Selection of funds

When selecting the funds included in this performance analysis, a number of requirements have been set up. To begin with, this section describes the fund selection criteria shown in table 3. Secondly, the implications of a potential selection bias are discussed. Finally, the data sources are presented.

Table 3. Fund sample selection criteria

Criteria	SRI funds	Regular funds	Replicating portfolios
Open-ended	a	a	a
Equity > 75%	a	a	a
Non-specific	a	a	a
Active	a	a	a
SRI screening	a		a
No charity donations	a	a	a
Category	a	a	a
Fund data Jan 2001 - Sep 2007	a	a	a
Holding data Jan 2001 - Sep 2007		a	a

First of all, the study focuses on open-ended funds which are open to all investors for investment. Since holding data in equity funds is investigated, a minimum of 75% equity holdings in the funds is required, in line with Morningstar's definition of an equity fund. The funds are also non-specific in order for them to be matched with an appropriate index. As fund management is an important component in the study, the funds need to be actively managed and passive funds are therefore excluded. All funds that are marketed in Sweden are included in the sample, but the regular funds and replicating portfolios only include Sweden registered funds as consistent holding data only was available for these funds through Finansinspektionen.⁵ As previously mentioned, a SRI fund is defined as a fund which actively takes SRI criteria into consideration when selecting companies to include in their portfolio. For a list of the SRI funds in the sample and their respective screening methods, see Appendix 1. SRI funds which donate a percentage of their return to charities and other similar causes are excluded as their objectives of maximizing investor return can become altered.

Furthermore, this study focuses on funds with an international investment universe. This is mainly due to the fact that Swedish companies generally perform very well in socially responsible screenings. Out of the 100 companies on the screening list in Appendix 2, only SAS and Esselte are listed on the Swedish stock exchange. Consequently, if funds with Swedish investment universes would have been investigated and screened for unethical companies, an insignificant change in the fund holdings composition would have been observed. All the

⁵ The SRI fund sample, thus, includes 7 foreign registered funds.

selected funds were divided into European, North American and World funds, in accordance with their Morningstar categories.⁶ The geographic split for the funds can be seen in the table below.

Table 4. Geographic split of funds' investment universes

	SRI funds	Regular funds	Replicating portfolios
Europe (%)	30%	28%	28%
North America (%)	13%	17%	17%
World (%)	57%	55%	55%

Small-cap funds have been excluded since the CSR information on small companies worldwide is very limited. Emerging markets funds are not included either due to the poor coverage of companies in these countries.

Furthermore, only funds which have been alive during the whole time span of the study (January 2001 – September 2007) are considered. In Finansinspektionen's quarterly holding data, regular funds have been selected which have a consistent series of data points throughout the period.⁷ Funds which have started/ended during the period or have been inconsistent in their reporting are thus excluded. To be consistent, only SRI funds which have been active during the same period have been included. The funds have been selected this way to achieve data consistency and increase comparability of the funds over the time period.

In relation to the fund selection process, we have controlled the consistency of the criteria employed. Funds merge, and change names and investment universes making it important to check that the criteria are reliable during the time period. The consistency of the funds international investment profile has therefore been inspected. The equivalent control has been done for the SRI funds to make sure they have invested socially responsibly over the period.

⁶ The Morningstar categories included are: Europe Large-Cap Blend Equity; Europe Large-Cap Growth Equity; Europe Large-Cap Value Equity; Europe Mid-Cap Equity; Europe ex-UK Equity Large Cap; Eurozone Large-Cap Equity; Eurozone Mid-Cap Equity; Global Large-Cap Blend Equity; Global Large-Cap Growth Equity; Global Large-Cap Value Equity; U.S. Large-Cap Blend Equity; U.S. Large-Cap Growth Equity; U.S. Large-Cap Value Equity; U.S. Mid-Cap Equity. In addition, the pension funds within the groups Länförsäkringar Pension and Nordea Premiepensionfond have been included in the sample since they fulfill the 75% requirement even though they are classified by Morningstar as Balanced Generation funds.

⁷ A maximum gap of 3 data points in sequence have been allowed for. When data is missing the holdings are assumed to be equal to the latest known data entry. In total there are 7 funds with one or more missing entries.

As the fund sample has been selected according to a number of criteria, there will be selection bias in the data. It is difficult to assess how the various choices affect our results on an overall level. Some of the most relevant issues with the fund selection process will be discussed in the following paragraphs.

First of all, the sample is to a large degree adjusted to the type of screening we have had access to. The type of funds chosen are the ones in which the screening can (i) have an effect on the composition of the holdings and (ii) give accurate results, i.e. we know with a high certainty that the holdings in the replicating portfolios are not including companies with any major international law violation on their record. As a result, the conclusions made in this study cannot easily be applied to the Swedish stock market or emerging markets as funds focusing on these regions are not included in the sample.

Secondly, the SRI fund sample can be affected by the fact that it contains funds marketed in Sweden, while only funds registered in Sweden have been included in the regular fund sample. The gain of including 7 foreign registered funds⁸ and thereby increasing the SRI sample by 44% is believed to outweigh the fact that the criteria are slightly different. The mean excess return for the foreign registered funds is 3.03%, compared to 3.09% for Sweden registered funds.

Finally, the sample of funds suffers from survivorship bias as only funds which are alive during the investigation period are included. Both the SRI funds and the regular funds are affected by the bias and it should therefore not distort the comparison analysis. The problem lies in the possibility of the performance to be overstated on average. The severity of the survivorship bias for funds have been further investigated by Grinblatt and Titman (1989) and Brown and Goetzmann (1995) and they conclude that the effect is as small as about 0.5% per year.

Finansinspektionen supplies quarterly holding data for all Swedish registered funds. Monthly Net Asset Value (NAV) data for the funds have been collected from the SIX Trust database. All NAV data has been adjusted and thus includes reinvested dividends, accounts for capital gains and administrative fees have been subtracted. Data on foreign registered SRI funds have been

⁸ Credit Suisse Equitiy Fund Global Sust. B, Credit Suisse Equity Fund Global Sust. I, Dexia Sustainable Europe Classic C, Dexia Sustainable North America Classic C, JPM Global Socially Responsible Fund A, SAM Sustainable Leaders Fund, UBS Equity Fund - Eco Performance B.

collected from Thomson Financial's DataStream.⁹ Monthly data has been chosen to avoid the "noise" that is common in daily/weekly data.

5.1.2. *Index benchmarks*

In previous research, a lot of emphasis has been placed on choosing the most appropriate benchmark index. Luther et al. (1992) concluded in their study that SRI funds to a larger degree invest in small-cap companies. In line with this, Gregory et al. (1997) also find that when a small-cap index is not used as a benchmark, SRI funds tend to underperform. This is, however, mainly a result of the study being performed on the UK market, as UK asset managers are specialized on small and mid-cap companies (Eurosif, 2006). In addition, many SRI funds in the late 1990s had a large share of their holdings in small IT companies. This was due to the fact that the sector was relatively straightforward in terms of assessing CSR practices. Today, SRI funds generally focus more on large-cap companies (Eurosif, 2006). In addition, any potential small-cap bias in our sample is mitigated by excluding the Morningstar small-cap categories.

There has also been a debate regarding if SRI funds' performance should be compared to a SRI index or a regular index. Bauer et al. (2007) use both a regular index and a SRI index to compute their performance results and conclude that the regular index fits the SRI mutual funds better than a SRI index. This is most likely due to the fact that the screening of SRI funds does not necessarily match the screening of the SRI indexes. SRI indexes often include large-cap firms in the US and Europe and use a selection process similar to a *best-in-class* screening (Mistra, 2001). Porter and Kramer (2006) also argue that SRI indexes apply different rankings and weightings which could lead to a distortion of the funds' returns. Therefore, the three regular indexes MSCI Europe Core, MSCI North America Core and MSCI World Core have been chosen as benchmarks to match the geographic investment universes of the funds.

5.1.3. *SRI screening*

Screening of equity holdings varies greatly between SRI funds. As no common standards exist there are many ways to screen companies in a study like this one. The three main categories of screening were identified in section 2.2.

⁹ Datastream's datatype Return Index (RI) have been used to calculate the returns of the funds. The index accounts for reinvested dividends, capital gains, and administrative fees.

Generally, negative screening excludes companies based on their industry membership. This option has been considered, but as negative screening requires a number of value judgments, it has been rejected. Exclusions are often based on a cut-off point method where companies are excluded if more than a certain percentage of their annual turnover is derived from an unethical industry, e.g. weapons. Also, screening stocks based on their industry membership would require a value judgment of which industries are “good” or “bad.” The screening needs to be based on a more objective way of defining socially responsible companies. Funds which use positive screening often choose to invest in companies which are best in their industries at handling CSR questions. Even though this method has several advantages, it cannot be used to create the type of replicating portfolios constructed in this study. It would require access to a large database with SRI rating on every company included in the portfolios. Engagement is not either an option, as it would require a long-term dialogue with the companies included in their holdings. Instead, another type of negative screening is applied in this study: norm-based screening excludes companies that explicitly violate a number of conventions. It is therefore more reliable than industry based negative screening. Senior SRI Analyst Reinhilde Weidacher at Ethix SRI Advisors (2007) indicates that there is a trend of fund managers moving away from industry based negative screening towards the norm-based screening. It is easier to find a common value ground among investors for excluding companies that have violated international agreements rather than excluding certain industries. Therefore, norm-based screening will be used as the proxy of social responsible practices in this study.

In this paper, the norm-based screening list has been compiled from three different sources: Sjunde AP fonden (AP7)¹⁰, Norske Statens pensjonsfond – utland (NSP)¹¹ and Ethix SRI Advisors. The full list of companies which AP7 and NSP exclude from their funds is provided in Appendix 2.¹² Some examples of excluded companies are:

- **Anvil Mining** – reported to have been involved in a massacre of civilians in Congo
- **Petrobras** – at least 11 incidents between 1998 and 2001, resulting in the death of 15 employees and more than 5.3 million liters of oil spills

¹⁰ Seventh Swedish Pension Fund.

¹¹ Norwegian Government Pension Fund Global.

¹² The companies excluded by Ethix SRI Advisors are not listed as it is proprietary information.

- **Wal-Mart** – cases of discrimination in Guatemala, as well as union preventive actions, violations of labor laws, and reported child labor in the US

In 2001, Sjunde AP fonden instigated norm-based screening in Sweden and is thus regarded as one of the pioneers on this type of screening internationally. According to CEO Peter Norman (2007), they did not want to use conventional negative screening or positive screening as they found them too subjective. Instead, they chose to develop, together with external SRI screening firms, a list of companies that breached conventions and other international agreements that the Swedish government had signed.

In November 2001, one of the world's largest pension funds, Norske Statens Pensjonsfond, also decided to employ a norm-based screening method on its global fund. They appointed an Advisory Commission on International Law with the task of making recommendations to the Norwegian government regarding exclusions.

Ethix SRI Advisors is a Swedish based SRI screening company which was started in 2003 with Sjunde AP fonden as an investor. They provide advice and data to AP7, but also to other mutual funds and companies. One of their products is a screening list based on normative criteria. The five norm areas in which companies are investigated are: human rights, international humanitarian law, labor rights, environmental impact and anti-corruption.

The consolidated screening list includes the screening lists from all three resources and it has been adjusted to include the main listings on different stock exchanges and large subsidiaries. Due to the starting year of the different screening sources, AP7 covers the whole sample period while NSP starts in 2002 and Ethix in 2003. For that reason, the number of companies on the list increases over the sample period from 56 in 2001 to 111 in 2007. It is difficult to say in what way this affects our study. The screening could possibly be less encompassing during the first few years. This is, however, in line with the general development of the SRI industry, which has developed more stringent criteria over time.

5.2 Method

In this section the construction of the replicating portfolios and the methods of evaluating the performance of the SRI funds, regular funds and replicating portfolios will be described in detail.

5.2.1. Construction of the replicating portfolios

When creating the replicating portfolios, in total, approximately 150,000 holding data points have been screened for “unethical” companies. First of all, the quarterly holding data for each regular fund has been collected. Secondly, the norm-based screening list has been compared to the holdings for each fund in every quarter and matches have been recorded. Thirdly, returns of the stocks on the norm-based screening list have been collected.¹³ Fourth, the returns of the replicating portfolios have been calculated as described in equation (1). Since the holding data only is available on a quarterly basis, the holdings are assumed to be constant during the quarter to be able to calculate monthly returns.

$$r_{jt} = \frac{R_{jt} - \sum_{i=1}^n \left[\frac{mv_{t=0}}{FA_{j,t=0}} * \left(\frac{p_t}{p_{t-1}} - 1 \right) \right]}{1 - \sum_{i=1}^n \left[\frac{mv_{t=0}}{FA_{j,t=0}} \right]} \quad (1)$$

r_{jt}	return of the replicating portfolio, where i denotes a fund and $t \in [1, 3]$ depending on which month in a quarter the return is calculated for
R_{jt}	return of the regular fund where i denotes a fund and $t \in [1, 3]$ depending on which month in a quarter the return is calculated for
$mv_{t=0}$	market value of a stock holding at the start of the quarter
$FA_{j,t=0}$	total fund assets at the start of the quarter
p	return index of a stock
i	denotes a stock on the screening list

5.2.2. Fund performance evaluation

There are several different ways to measure fund performance. Treynor (1965), Sharpe (1966) and Jensen (1968) have developed some of the most commonly used techniques today. Jensen’s alpha and the Sharpe and Treynor ratios are all applied on a regular basis in the studies mentioned in the previous chapter. However, Jensen’s alpha has been established as the most frequently employed model to measure risk adjusted return and it is the method that will be used in this paper. In this model, the excess fund return is regressed against the excess return of the

¹³ The returns have been currency adjusted. Thomson Financial’s DataStream provides data on monthly stock returns and exchange rates. Datastream’s data type Return Index (RI) have been used to calculate the returns of the stocks. The index accounts for reinvested dividends, capital gains, and administrative fees.

market¹⁴ to derive an intercept alpha (α) which measures the abnormal return¹⁵ of the mutual fund. If Jensen's α is positive (negative), and significant, it indicates that the fund outperforms (underperforms) the market. The regression model is presented below.

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + \varepsilon_i \quad (2)$$

$R_i - R_f$	excess return of the fund
α_i	intercept which measures the abnormal returns of the fund
β_i	systematic risk of the fund
$R_m - R_f$	excess market return
ε_i	random error term

The Jensen's alpha measurement has been criticized for its inability to capture market-timing ability. If a fund manager has market-timing ability he/she can change the composition of the holdings in a fund to obtain a better performance. A fund manager's ability to time the market is not accounted for in the model since the beta coefficient is kept constant. As a result, the measurement suffers from a bias if a fund manager can anticipate the market movements, since successful timers will get a track record of negative performance. To ensure unbiased results, the portfolios are tested for market-timing ability by applying the Treynor-Mazuy (1966) model. The regression builds on the Jensen's alpha linear regression in the previous paragraph with an additional third term: the squared excess return of the market. If the market-timing coefficient is statistically significant, the fund manager has added value to the fund performance through his/her market timing ability. The following regression is applied:

$$R_i - R_f = \alpha_i + \beta_i (R_m - R_f) + \beta_{iT} (R_m - R_f)^2 + \varepsilon_i \quad (3)$$

$R_i - R_f$	excess return of the fund
α_i	intercept which measures the abnormal returns of the fund
β_i	systematic risk of the fund
$R_m - R_f$	excess market return
β_{iT}	market timing coefficient of the fund
ε_i	random error term

¹⁴ The excess return of the market is the market return less the risk free rate. The 1 month STIBOR interest rate, which is used as a proxy for the risk free rate, was collected from the Swedish Riksbank. The indexes mentioned in section 5.1.2 are used as proxies for the market return.

¹⁵ The abnormal return of a portfolio is the return in excess of the expected rate of return of the portfolio.

To investigate the results on an aggregate level, the performance of the SRI funds, regular funds and replicating portfolios, have been tested in two ways. In the first aggregate test, equally weighted mean returns of the three portfolios have been calculated on a monthly basis. In accordance with equation (1), the mean excess returns of the groups have then been regressed against the excess return of the market¹⁶, to obtain an alpha on an aggregate level.

In the second test at the group level, performance is tested by applying a zero sum portfolio strategy. The method of investigating the relative return of the different portfolios in this way is described by Engström (2004). The first step in this test is to calculate the monthly mean returns for the different groups. After that, the differences between the group returns are computed on a monthly basis. Finally, the excess returns are regressed against a benchmark¹⁷ in a similar way to the Jensen's alpha regression. In reality this would be associated with a strategy in which one would buy one portfolio of funds (with equal weights) and short¹⁸ another type of portfolio (with equal weights). The reasoning behind investigating this trading strategy is that if the investor has bought superior (inferior) assets to the ones sold, the excess return will be positive (negative). The zero sum strategy portfolios are tested in accordance with equation (4) below.

$$R_i - R_j = \alpha_{ij} + \beta_{ij}(R_m - R_f) + \varepsilon_{ij} \quad (4)$$

$R_i - R_j$	excess return created by buying one portfolio of funds (i) and shorting another portfolio of funds (j)
α_{ij}	refers to the abnormal performance of the zero sum portfolio
β_{ij}	refers to the systematic risk of the zero sum portfolio
$R_m - R_f$	excess market return
ε_{ij}	random error term

As a final check, the robustness of the results will be investigated. Three types of diagnostic tests will be performed on the regression residuals: the Jarque-Bera test of normality, Durbin's alternative test for autocorrelation and the Breusch-Pagan/Cook-Weisberg test for heteroscedasticity.

¹⁶ The world index has been used to cover the different investment universes.

¹⁷ The world index has been used to cover the different investment universes.

¹⁸ Shorting refers to the activity of an investor selling a borrowed asset with the expectation that the asset will decrease in price. If the value goes down, the investor can buy it back at a lower price and hence make a profit by keeping the difference between the revenue of the sale and the money paid to buy back the asset.

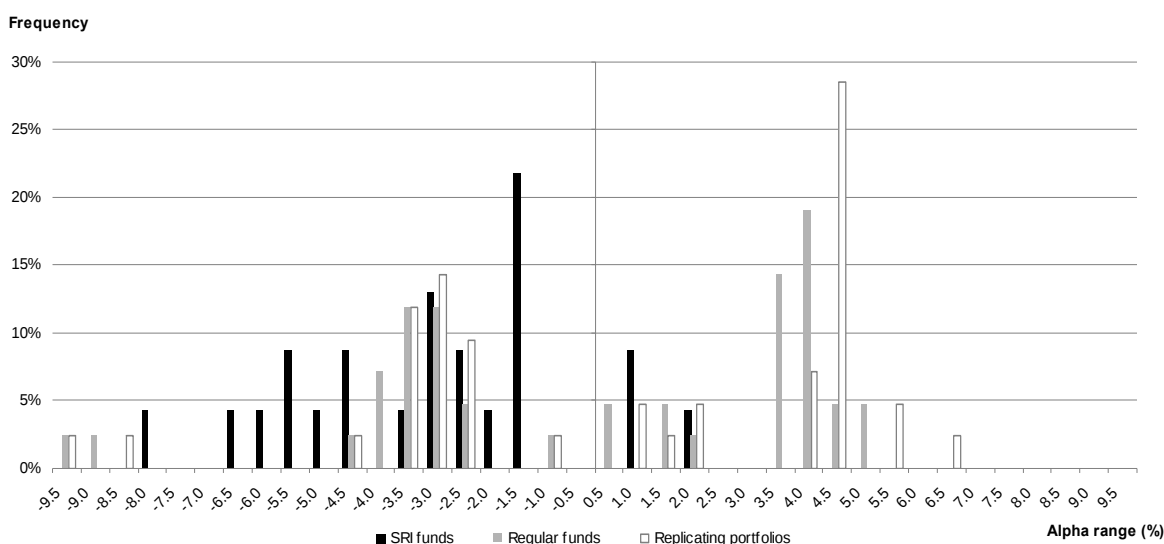
6. RESULTS

The results from the fund performance tests presented in this section are divided according to the hypotheses. A section is also included on fund performance divided by geographical investment universe. The results are examined on a fund basis as well as at an aggregate level. All alphas are reported on an annual basis and hence describe the yearly abnormal return for a portfolio expressed as a percentage. In the final section, the robustness of the results is investigated.

6.1 Hypothesis I – Overall performance

An overview of the individual fund performances is presented in Appendix 3. In the table, the shaded area divides the sample of funds between the ones with positive and the ones with negative Jensen's alpha. When looking at the funds on an individual basis, it is interesting to see that there seems to be a major difference between SRI funds and regular funds. Only 13% of the SRI funds have a positive alpha, while out of the regular funds, 55% of the funds have positive alphas. When looking at the significance of the results, one can see that it is mainly the negative alphas that are statistically significant. The frequency distribution of the alphas is depicted in figure 3 below. The plot of the SRI fund alphas shows that the abnormal returns on average are negative with a mean alpha of -2.8%. However, the distribution is positively skewed, with a median of -2.6%. The distribution of alphas for the regular funds, on the other hand, has a positive average of 1.1% with a few negative outliers.

Figure 3. Distribution of Jensen's alphas



The results from the aggregate level tests are presented in table 5 below. From the two first results, which describe the separate regressions of regular and SRI funds, one can see that the regular funds have a positive alpha while the SRI funds have a negative one. This is in line with the individual fund results.

Table 5. Results from group level tests - Overall performance

	α (%)	t-value	p > t
Mean regression			
Regular funds	0.687	0.340	0.734
SRI funds	-2.131	-1.100	0.275
Zero sum portfolio			
Regular funds vs. SRI funds	2.818	3.330	0.001

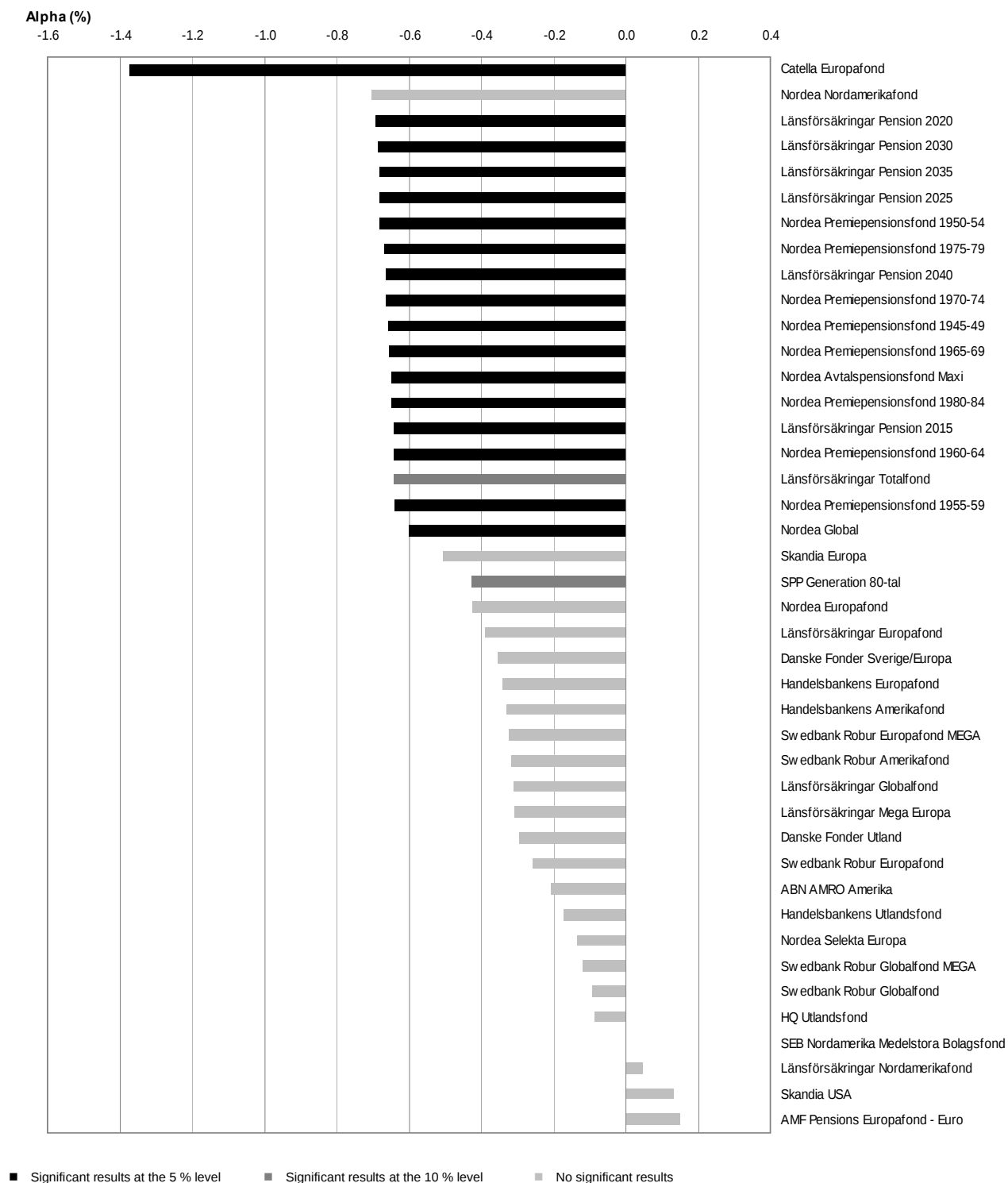
In the zero sum portfolio test, where the regular and SRI funds are tested against each other, the alpha is 2.8% and significant. By buying the regular fund portfolio and shorting the SRI fund portfolio one can hence earn a positive return. This would support the theoretical perspective that SRI activities do not have a positive impact on financial performance. The null hypothesis that SRI screening does not affect the financial performance of mutual funds, can thus be rejected. As explained before; when testing hypothesis I it is difficult to draw too many inferences from the results. To understand what components affect the overall performance of mutual funds it is crucial to look at the test results for hypothesis II and III.

6.2 Hypothesis II – Firm level performance

To test the firm level performance, the regular funds and their replicating portfolios are compared. As the replicating portfolios are derived from the regular funds, the fund managers are the same. Fund management will therefore be constant, and thus not affect the comparability of the results. The difference between these two groups can then be attributed to the performance of the fund strategy of applying a SRI screening or not.

In Appendix 3, a change can be observed in the alpha values between the individual regular funds and replicating portfolios. With norm-based screening, 38 of the funds have a higher alpha value whereas 3 are negative and 1 neutral. In addition, in figure 3 in the previous section one can see that the distribution of the replicating portfolios has a higher average alpha (1.09 vs.

1.07). To investigate this further, the zero sum strategy portfolios have been tested for each fund. In the individual fund case, $R_i - R_j$ in equation (4) represents the excess return of, e.g. buying the Catella Europa fund and shorting the Catella Europa replicating portfolio. The test results for the individual funds, which can be found on the next page, show quite interesting results. As the zero sum portfolio is set up in the way that one is buying a fund and shorting the corresponding replicating portfolio, a negative alpha indicates that the replicating portfolio has a superior performance. Out of the 42 funds, 90% would have benefitted from applying a norm-based screening on their portfolios. The results are significant at 5% level for 40% of the funds. It is worth noting that the Länförsäkringar Pension funds and Nordea Premiépension funds show very similar results respectively. This is most likely due to the fact that the funds' holdings are similar across the funds for the different fund managers.

Figure 4. Results of zero sum portfolio tests – Regular funds vs. replicating portfolios

With regards to the aggregate tests, the results from the mean regression and zero sum portfolio tests are presented in table 6 below.

Table 6. Results from group level tests - Firm level performance

	α (%)	t-value	p > t
Mean regression			
Regular funds	0.687	0.340	0.734
Replicating portfolios	1.125	0.520	0.603
Zero sum portfolio			
Regular funds vs. replicating portfolio funds	-0.437	-1.730	0.088

In the mean regression tests, we find that both the regular funds and replicating portfolios have positive Jensen's alpha coefficients with a slightly higher value for the replicating portfolios. However, the test results significance is quite low. In the zero sum portfolio test, the alpha is -0.4% which suggests that the replicating portfolios with a norm-based screening perform better than the regular funds. The alpha is significant at the 10% level. As norm-based screening is our proxy for socially responsible practices, the null hypothesis that socially responsible practices do not have an effect on financial performance on a firm level can be rejected.

When examining the firm level component of fund performance one can see that the results are not in line with the hypothesis I results. Hypothesis II, instead, supports a positive relationship between financial performance and corporate social practices on a firm level.

6.3 Hypothesis III – Fund management performance

Fund management is tested by comparing the replicating portfolios and the SRI funds financial performance. In these tests, the ambition is to hold the limitation of the funds investment universe to socially responsible investments constant. Important to notice is that the norm-based screening used in the replicating portfolios does not perfectly correspond to the screening used by the SRI funds (see Appendix 1). Differences observed in alpha will therefore to some degree reflect a combination of the difference in SRI screening and fund management. However, by attempting to separate fund management in this way it is possible to get a clearer picture of the impact of fund management, than when using the methods described in the section on previous research. As could be seen in figure 3 in the beginning of the chapter, the mean abnormal returns

are higher for the replicating portfolios. There are a few negative outliers in the replicating portfolio and SRI fund distributions, but they should not affect our conclusions.

In the aggregate tests, the investment strategy of the zero sum portfolios is to buy the replicating portfolios and short the SRI funds. In table 7 below, the results from the two group level tests are presented.

Table 7. Results from group level tests - Fund management performance

	α (%)	t-value	p > t
Mean regression			
Replicating portfolios	1.125	0.520	0.603
SRI funds	-2.131	-1.100	0.275
Zero sum portfolio			
Replicating portfolio funds vs. SRI funds	3.255	3.690	0.000

In the mean regression test, the replicating portfolios have a positive alpha and the SRI funds a negative alpha but neither are statistically significant. The alpha is found to be 3.3% for the zero sum portfolio test and it is significant at the 1% level. As the alpha captures two different components; SRI screening and fund management it becomes more difficult to directly reject hypothesis III. Since the replicating portfolio performs best among all the groups of funds, the results indicate that *both* the firm level performance (type of screening) and fund management are better. Fund management can then be regarded as superior for the replicating portfolios but also for the regular funds as they have the same fund managers. Hence, the results indicate that the third null hypothesis, that the fund management differs between replicating portfolios and SRI funds, can be rejected.

6.4 Extension – Results divided by geographical investment universe

To further understand the results reported in the previous sections, it is interesting to see how the results are affected by variations between different regions. The investment universes of the individual funds are included in the result tables in Appendix 4-6. In table 8 below, the aggregate level results are presented. The SRI funds underperform the market in all regions, with the North American investment universe funds as the worst performers. For the regular funds and replicating portfolios, the World market funds have been the top performers. Nevertheless, the

largest discrepancy can be found in the World funds as the SRI funds' abnormal performance is negative and large in absolute terms. In the replicating portfolios, the exclusion of the unethical companies leads to superior performance in all markets.

Table 8. Results from aggregate tests - Divided by geographic investment universe

	Sample size		α (%)	t-value	p > t
SRI funds	23	100%	-2.131	-1.100	0.275
Europe	7	30%	-2.388	-1.850	0.068
North America	3	13%	-3.469	-1.560	0.124
World	13	57%	-2.739	-1.500	0.137
Regular funds	42	100%	0.687	0.340	0.734
Europe	12	28%	-1.584	-1.160	0.250
North America	7	17%	-3.147	-1.630	0.106
World	23	55%	1.927	0.880	0.384
Replicating portfolios	42	100%	1.125	0.520	0.603
Europe	12	28%	-1.206	-0.800	0.426
North America	7	17%	-2.952	-1.450	0.152
World	23	55%	2.466	1.060	0.294

6.5 Robustness of results

In this section the validity and reliability of the results are discussed. As mentioned in the data section, the sample of funds suffers from survivorship bias. The results could therefore be overestimated to some degree. In the tests, this has been dealt with by applying a comparative analysis. Since all the funds are affected by the bias, the results from the zero sum portfolio tests should be relatively unaffected.

To further examine fund management performance, market timing ability is tested for the fund managers. The reason for this is that Jensen's alpha keeps the beta coefficient constant while in reality it varies over time. A fund manager has market timing ability if the beta coefficient (β_T) of market-timing ability is statistically significant. Results for the individual funds are found in Appendix 4-6. In the test results, one can see that only one of the fund managers for the regular funds and only four fund managers of the SRI funds seem to have statistically significant market timing ability at the 10% level. We can therefore with greater certainty rely on the results from the Jensen's alpha regressions.

After performing the regressions, three different diagnostic tests have been used to determine the accuracy of the estimated variables. First of all, the Jarque-Bera test has been used to test the assumption of a normally distributed error term. The results are presented in Appendix 7. The null hypothesis of a normally distributed error term is rejected in 35% of the cases, and is most likely due to outliers. Secondly, the Beusch-Pagan/Cook-Weisberg test has been performed to test the sample for heteroscedasticity in the residuals. For SRI funds and regular funds, the null hypothesis of heteroscedastic error term is rejected in 62% and 87% of the cases, respectively. However, it is worth noting that heteroscedastic residuals seem to be a bigger problem in the replicating portfolios (29%). Finally, Durbin's alternative test is performed to test for autocorrelation as it is a common phenomenon in time series data. It is evident that autocorrelation in the residuals is the main problem of the data. Hence, the OLS assumption of covariance stationarity could be violated and the estimated coefficients biased. As a result, the residuals could be underestimated while the t-values might be overestimated. Even though the sample residuals may be correlated in some cases, the results are strong enough to support the hypotheses. The gain of making adjustments for autocorrelation is believed to be limited. In previous studies, the change in the results has been found to be small (Ferson and Schadt, 1996). The conclusions in this study will therefore be drawn from the results as they are presented.

7. DISCUSSION

A more in depth discussion of the paper's findings is presented in this section. First of all, theory related to firm level performance and fund management performance is discussed. Thereafter, practical implications of the results for investors and fund managers are analyzed.

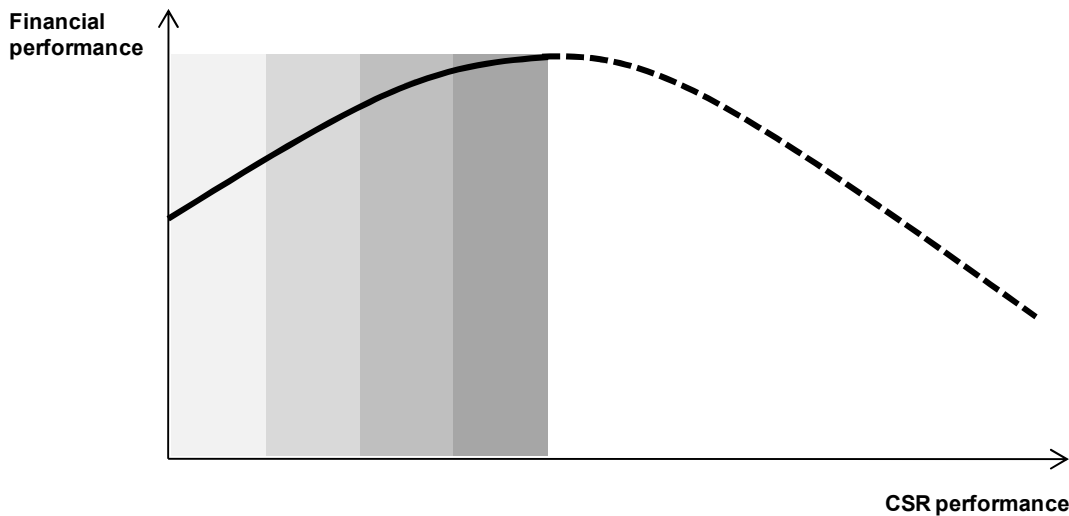
7.1 Theoretical discussion of results

After having presented the results from the tests in the previous chapter, the ambition with this section is to place the findings within a theoretical framework.

7.1.1. Theoretical discussion – Firm level

The results from tests of hypothesis II supports the arguments made by the value creation school. There is an increase in financial performance when applying the norm-based screening to regular funds which indicates that the relationship is positive to some degree. Figure 4 describes an alternative interpretation of the relationship, which is a combination of the value creation and cost-concerned school of thoughts (Wagner, 2001).

Figure 4. Inverse u-shaped relationship between CSR performance and financial performance



In this model, the relationship between financial performance and CSR performance of firms is assumed to be inversely u-shaped. Investing in CSR practices is believed to be value creating up to a certain degree, after which the costs exceeds the benefits. If one applies this model to our findings, it implies that the norm-based screening excludes companies which are situated somewhere in the grey shaded area. Thus, it is beneficial for the funds to perform this type of

screening. However, it is not possible to determine if this is the most optimal screening. It might be better to increase the level of screening even more. The level of screening in the SRI fund group is in most cases higher than the norm-based screening used in the replicating portfolios (see Appendix 1). Assuming that the inferior performance of SRI funds to some degree is due to the financial performance of the firms, and not only the fund management performance, the companies screened by the SRI funds could be assumed to be situated somewhere along the dotted line.

There could be a number of reasons why the companies on the norm-based screening list underperform the market. It may be that not all socially responsible practices are profitable, but the companies excluded in this study are extreme cases. First of all, it takes quite a lot to be excluded according to the norm-based screening as the incidents need to be of severe kind and verifiable. Being excluded via the norm-based screening could also be an indication of other problems with operations or overall risk management within the company. Companies that are not excluded in the norm-based screening could then be relatively better at managing their companies. Secondly, since the norm-based screening requires some kind of public verification, the companies that have violated a UN convention or another international agreement would most likely receive a lot of negative publicity. Porter and Kramer (2006) argue that only “real” CSR, not cosmetic, affects the profitability positively. The positive profitability is also the focus of Friedman when he argues that a company should use its resources in the best possible way to maximize profits. In these cases, it could be argued that increasing the socially responsible activities would be in line with the profit goals of the shareholders and thus create value for the companies.

7.1.2. Theoretical discussion – Fund management

In terms of discussing the results of the fund management tests in a theoretical framework, very little has been written on the difference in fund management between regular funds and SRI funds. Most of the focus of previous research has been on the firm level analysis. As a result, fund management has been assumed to be the same across fund managers. However, research by White (1991) and White (1996) conclude that the quality of fund management could have a significant impact on the financial performance of funds, which is in line with the results of this study. As also mentioned in the further research section, a development of theory and research

on the difference in fund management between regular funds and SRI funds should be encouraged. Nevertheless, an argument made in theories related to SRI fund management is that these funds could be less diversified. In line with conventional portfolio theory, SRI funds could have a higher systematic risk exposure compared to regular funds. The results, however, suggest that this is not a problem, as the replicating portfolios still perform better even though they are less diversified than the regular funds.

The fund management of regular funds and SRI funds could be different for a number of reasons. First of all, the variation in fund management could be a result of a difference in objectives of fund managers. Regular fund managers have one overall goal to achieve the highest possible return to a specific risk return. On the other hand, SRI fund managers have multiple goals to attend to. Not only should they achieve high returns but they also have to make sure that their portfolio of companies is in line with the chosen SRI screening. Secondly, a difference in investor preferences between regular funds and SRI funds could affect the need to perform well. If investors who choose SRI funds accept a small trade-off in returns in exchange for a SRI screening, the pressure on SRI fund managers may be lower. However, a majority of the investors of SRI funds are large institutions which do not accept inferior performance (Eurosif, 2006). Thirdly, some of the SRI funds apply an engagement method of working long-term with their holdings. As a result of the active commitment, it can become more difficult to change the composition of funds holdings and thus the flexibility needed to achieve higher returns.

7.2 Practical implications

From a practical perspective, the results have a number of implications for different actors in the SRI industry. For companies, there seems to be arguments in favor of not ending up on a norm-based screening list. However, the focus on this section will be on investors and fund managers as they are directly affected.

7.2.1. Investors

In the introduction of this paper we suggested that there may be different motives to invest in SRI funds. The results from the tests show inferior performance for SRI funds compared to regular funds. This implies that regardless of motivation for investing in SRI funds, there will be a financial trade-off. As an SRI investor, one will have to give up some of the returns in favor of the SRI screening. The results have also shown that this is not necessarily a result of the firm

level performance of socially responsible companies but of fund management. The results point towards norm-based screening being a preferable way of taking SRI practices into account while maximizing returns. Therefore, it becomes important for the investor to evaluate funds' screening. To summarize, both the screening method and fund management need to be analyzed before choosing a fund.

7.2.2. Fund managers

From the perspective of a fund manager, it is important to investigate if there is a difference between fund managers of regular funds and SRI funds. If there is a difference, it would become necessary to analyze the underlying reasons and potentially initiate remedying actions.

With regards to the screening of the funds, the replicating portfolios show that the norm-based screening outperforms both the regular funds' and SRI funds' screening strategies. Therefore, not only SRI funds should consider the norm-based screening but also the regular funds. To conclude, fund managers need to continue to evaluate their fund managers and screening method to improve the returns of all their funds.

7.3 Further research

In the process of writing this study, a number of new questions have arisen in line with the focus of our hypotheses. The first area of study that could be developed is the funds' screening of companies. As the screening process has an important role to play in the fund performance, more transparency and understanding could clarify the relationships. A first step could be to use the data collected for our tests and apply a different screening method to see if the results change. Another alternative could be to study the SRI funds on the Swedish market to understand their screening process and the differences between the SRI funds and regular funds.

In this study, we have also observed that fund management plays an important role in explaining the difference in fund performance between SRI funds and regular funds. Therefore, it is important to emphasize the need to divide the fund performance measure into its components; firm level and fund management performance in any future research. Within the fund management component it would be interesting to develop the theories and research field on fund management differences between SRI funds and regular funds.

8. CONCLUSION

The aim of this study has been to evaluate the performance of Socially Responsible Investment (SRI) funds. Investing in SRI funds has lately become increasingly popular. Still, only a few studies have been done on the Swedish market. In combination with the inconclusiveness of previous research on the performance of SRI funds, this study is of importance and interest both from a theoretical and practical perspective.

First of all, regular funds were compared with SRI funds in line with previous studies. In the results, the regular funds performed better than the SRI funds. However, a problem with these types of tests is that they do not control for differences in fund management. We have therefore developed the method of evaluating SRI funds by decomposing fund performance into firm level performance and fund management performance.

In terms of firm level performance, we compare regular funds with replicating portfolios that have been adjusted for unethical companies according to a norm-based screening method. We find that the replicating portfolios perform better than the regular funds, suggesting that certain socially responsible practices affect fund performance positively.

Fund management is investigated by comparing the replicating portfolios with SRI funds. As the portfolios being compared do not have the same SRI screening, it becomes more difficult draw conclusions. However, the results suggest that the fund management of the regular funds (replicating portfolios) is better than the SRI funds.

On a practical level, the results have a number of implications for the SRI fund industry. Investors should carefully investigate the screening method and fund management of SRI fund investments as they seem to have an effect on the fund performance. Fund managers, in general, should on the other hand consider applying a norm-based screening to their funds as it seems to lead to superior fund performance.

To conclude, the findings of this study enable a better understanding of fund performance and therefore constitute a valuable contribution to the research field on the performance of SRI funds.

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10. APPENDIX

Appendix 1. Type of screening in SRI funds

Name	Negative						Positive							Engagement
	Norm-based	Alcohol	Weapons	Tobacco	Gambling	Pornography	Best-in-class	Social	Environmental	Business ethics	Labor standards	Human rights	Corruption	
Aktie-Ansvar Europa		a	a	a	a	a								
Banco Etisk Europa		a	a	a		a		a	a	a				
Banco Etisk Global		a	a	a					a		a	a	a	
Banco Euro Top 50		a	a	a		a		a	a	a				
Carlson Utlandsfond		a	a	a	a	a		a	a	a				
Credit Suisse Equitiy Fund Global Sust. B								a	a					
Credit Suisse Equity Fund Global Sust. I														
Dexia Sustainable Europe Classic C							a	a	a	a				a
Dexia Sustainable North America Classic C							a	a	a	a				a
Folksam Aktiefond Europa				a					a			a		
Folksam Aktiefond USA				a					a			a		
Folksam Globala Aktiefond				a					a			a		
Folksam LO Världen				a					a			a		
Folksam's Tjänstemannafond Världen				a					a			a		
JPM Global Socially Responsible Fund A								a	a	a		a		
SAM Sustainable Leaders Fund							a							
SEB Etisk Europafond - Lux	a		a	a	a	a								
SEB Etisk Globalfond	a		a	a	a	a								
SEB Etisk Globalfond - Lux	a		a	a	a	a								
SEB Stiftelsefond Utland	a		a	a	a	a								
UBS Equity Fund - Eco Performance B							a		a					
Öhman Etisk Index Europa		a	a	a										
Öhman Etisk Index USA		a	a	a										

The data in this table is based on information gathered from fund fact sheets, fund manager homepages and Morningstar fund descriptions. Since the information available in many cases is described generally for a set of funds, it can be difficult to clearly categorize. This table should therefore only be regarded as an indication of the actual situation.

Appendix 2. Companies excluded from AP7 and NSP 2001 - 2007

Company	Source	Company	Source
Alliant Techsystems Inc.	AP7, NSP	L3 Communications Holdings Inc.	AP7, NSP
Amerada Hess	AP7	Liz Claiborne Inc.	AP7
Ansell	AP7	Lockheed Martin Corp	NSP
Anvil Mining	AP7	Marathon Oil	AP7
AWB	AP7	Marriott International Inc	AP7
BAE Systems Plc.	NSP	Matsushita	AP7
Basf	AP7	Mitsumi Electric	AP7
Bayer AG	AP7	Nestle SA	AP7
BHP Billiton	AP7	Nike Inc	AP7
Bilfinger Berger AG	AP7	Northrop Grumman Corp.	NSP
Boeing Co	NSP	Occidental Petroleum Corp.	AP7
BP Amoco	AP7	Omron Corp	AP7
Bridgestone	AP7	PepsiCo Inc	AP7
Caci International	AP7	Petrobas	AP7
Cathay Pacific Airways	AP7	Petrobas Brasileiros	AP7
Chartered Semiconductors	AP7	Poongsan Corporation	NSP
Chevron Corporation	AP7	Posco	AP7
ChevronTexaco Corp	AP7	Raytheon Co.	NSP
Coca Cola Co	AP7	Repsol	AP7
DRD Gold Limited	NSP	Rio Tinto Limited	AP7
Dupont	AP7	Safran SA	NSP
EADS Co	NSP	Samsung Secs Co	AP7
EADS Finance BV	NSP	Sanyo Chemical Ind	AP7
Encana	AP7	Sanyo Electric	AP7
Esselte (Pendaflex)	AP7	SAS	AP7
Exxon Mobil Corp	AP7	Sears	AP7
Finmeccanica Sp.A.	NSP	Sears Roebuck & Co	AP7
Formosa Chem & Fibre	AP7	Siemens Ag	AP7
Formosa Plastic	AP7	Singapore Technologies Engineering	AP7, NSP
Freeport McMoRan Copper & Gold Inc	NSP	Standard Chartered Plc	AP7
General Dynamics Corporation	AP7, NSP	Sumitomo	AP7
General Motors	AP7	Sumitomo Metal Mng	AP7
Goodyear Tire & Rubr Co	AP7	Talisman Energy Inc	AP7
Group 4 Securicor	AP7	Target Corp	AP7
Halliburton	AP7	Texaco	AP7
Hindustan Lever	AP7	Textron	AP7
Honeywell International Inc.	NSP	Thales (ex Thomson)	AP7
Hyundai Heavy Inds	AP7	Thales SA.	AP7, NSP
Hyundai Motor Co	AP7	Titan	AP7
Imperial Chemical	AP7	Total Fina Elf	AP7
ING Group N.V.	AP7	Total S.A.	AP7
ITT Industries	AP7	Toyota Motor Corporation	AP7
Jaya Tiasa Holdings	AP7	Tyco Intl Ltd	AP7
Johnson Ctls Inc	AP7	Unilever Plc	AP7
Kerr-McGee Corporation	NSP	Union Carbide	AP7
Kia Motors	AP7	United Technologies Corp.	NSP
Kookmin Bank	AP7	Unocal Corp	AP7
KT Corporation	AP7	Wal-Mart de Mexico SA de CV	NSP
KT Freetel	AP7	Wal-Mart Stores Inc	AP7, NSP
Kyushu Matsushita	AP7	Yahoo	AP7

Appendix 3. Ranking of Jensen's alpha

SRI funds (%)		Regular funds (%)		Replicating portfolios (%)	
Banco Euro Top 50	1.582	HQ Utlandsfond	4.925	HQ Utlandsfond	6.298 *
UBS Equity Fund - Eco Performance B	0.646	SPP Generation 80-tal	4.690	SPP Generation 80-tal	5.114
SEB Etisk Europafond Lux SEK	0.508	Swedbank Robur Europafond MEGA	4.395	Swedbank Robur Europafond MEGA	5.043 *
Folksam LO Världen	-1.060	Danske Fonder Utland	4.196	Nordea Nordamerikafond	4.436
Folksam Aktiefond USA	-1.185	Nordea Nordamerikafond	3.742	Nordea Selekt Europa	4.396
Folksams Tjänstemannafond Världen	-1.214	Nordea Selekt Europa	3.716	Skandia USA	4.299
SEB Etisk Globalfond	-1.388	Skandia USA	3.645	Nordea Premiepensionsfond 1950-54	4.290
Folksam Globala Aktiefond	-1.396	Nordea Premiepensionsfond 1950-54	3.604	Nordea Premiepensionsfond 1945-49	4.283
Öhman Etisk Index USA	-1.709	Nordea Premiepensionsfond 1945-49	3.602	Swedbank Robur Amerikafond	4.264
Öhman Etisk Index Europa	-2.074	Swedbank Robur Amerikafond	3.599	Skandia Europa	4.204
SEB Etisk Globalfond - Lux	-2.353	SEB Nordamerika Medelstora Bolagsfond	3.562	SEB Nordamerika Medelstora Bolagsfond	4.202
Folksam Aktiefond Europa	-2.550 *	Skandia Europa	3.561	Danske Fonder Utland	4.196
Carlson Utlandsfond	-2.684	Nordea Premiepensionsfond 1980-84	3.472	Nordea Premiepensionsfond 1955-59	4.147
SEB Stiftelsefond Utland	-2.824 *	Nordea Premiepensionsfond 1955-59	3.466	Nordea Premiepensionsfond 1980-84	4.130
SAM Sustainable Leaders Fund	-3.212	Swedbank Robur Europafond	3.377	Swedbank Robur Europafond	4.044
JPM Global Socially Responsible	-4.152	Nordea Global	3.273	Nordea Global	3.915
Banco Etisk Europa	-4.304 **	Nordea Premiepensionsfond 1960-64	3.210	Nordea Premiepensionsfond 1960-64	3.876
Aktie-Ansvar Europa	-4.667 **	Nordea Premiepensionsfond 1970-74	3.004	Nordea Premiepensionsfond 1970-74	3.653
Dexia Sustainable Europe Classic C	-5.208 *	Handelsbankens Utlandsfond	1.530	Danske Fonder Sverige/Europa	1.960
Credit Suisse Equity Fund Gbl. Sust. I	-5.290 *	Länsförsäkringar Europafond	1.388	Länsförsäkringar Europafond	1.742
Banco Etisk Global	-5.518 **	Danske Fonder Sverige/Europa	1.258	Handelsbankens Utlandsfond	1.378
Credit Suisse Equitiy Fund Gbl..Sust. B	-6.334 **	Nordea Premiepensionsfond 1975-79	0.364	Nordea Premiepensionsfond 1975-79	0.964
Dexia Sustainable North America Classic C	-7.515 *	Nordea Premiepensionsfond 1965-69	0.162	Nordea Premiepensionsfond 1965-69	0.803
		Länsförsäkringar Pension 2025	-0.820	Länsförsäkringar Pension 2025	-0.687
		Nordea Avtalspensionsfond Maxi	-2.192	Nordea Avtalspensionsfond Maxi	-2.109
		Handelsbankens Europafond	-2.485	Handelsbankens Europafond	-2.169
		Länsförsäkringar Mega Europa	-2.548	Länsförsäkringar Mega Europa	-2.208
		Nordea Europafond	-2.793	Nordea Europafond	-2.485
		Länsförsäkringar Totalfond	-2.846	Länsförsäkringar Pension 2015	-2.596
		Länsförsäkringar Pension 2015	-2.903	Länsförsäkringar Totalfond	-2.676
		Swedbank Robur Globalfond MEGA	-2.944 *	Länsförsäkringar Pension 2040	-2.730 *
		Länsförsäkringar Pension 2040	-3.051 **	AMF Pensions Europafond	-2.812
		AMF Pensions Europafond	-3.138	Swedbank Robur Globalfond MEGA	-2.829
		Länsförsäkringar Pension 2020	-3.264 *	Länsförsäkringar Pension 2020	-2.841
		Swedbank Robur Globalfond	-3.345 **	Länsförsäkringar Pension 2030	-3.003 *
		Länsförsäkringar Globalfond	-3.373 *	Länsförsäkringar Globalfond	-3.082
		Länsförsäkringar Pension 2030	-3.506 **	Swedbank Robur Globalfond	-3.254 *
		Länsförsäkringar Nordamerikafond	-3.680 *	Länsförsäkringar Nordamerikafond	-3.291
		Länsförsäkringar Pension 2035	-3.705 **	Länsförsäkringar Pension 2035	-3.449 **
		Handelsbankens Amerikafond	-4.124 *	Handelsbankens Amerikafond	-4.258 *
		ABN AMRO Amerika	-8.610 **	ABN AMRO Amerika	-8.407 **
		Catella Europafond	-9.129 **	Catella Europafond	-9.177 **

* Significant results at the 10% level

** Significant results at the 5% level

Appendix 4. Performance of SRI funds

Name	Inv. Uni.	Average Monthly Excess Returns				Fund Performance Jensen's Alpha				Market Timing Ability Treynor-Mazuy		
		Min	Max	Mean	St. Dev.	β	α (%)	t-value	p > t	β_T	t-value	p > t
Aktie-Ansvar Europa	Europe	-0.169	0.058	-0.027	0.041	0.849	-4.667	-2.870	0.005	-0.274	-0.670	0.503
Banco Etisk Europa	Europe	-0.199	0.063	-0.032	0.050	1.043	-4.304	-2.720	0.008	-0.624	-1.600	0.113
Banco Etisk Global	World	-0.179	0.054	-0.035	0.048	1.022	-5.518	-3.210	0.002	-0.633	-1.430	0.158
Banco Euro Top 50	Europe	-0.221	0.100	-0.030	0.057	1.172	1.582	0.650	0.520	-0.108	-0.180	0.860
Carlson Utlandsfond	World	-0.161	0.049	-0.031	0.046	0.994	-2.684	-1.660	0.101	-0.393	-0.940	0.351
Credit Suisse Equitiy Fund Global Sust. B	World	-0.162	0.043	-0.033	0.047	0.955	-6.334	-2.030	0.046	-1.445	-1.810	0.074
Credit Suisse Equity Fund Global Sust. I	World	-0.161	0.044	-0.032	0.047	0.955	-5.290	-1.690	0.095	-1.447	-1.810	0.075
Dexia Sustainable Europe Classic C	Europe	-0.181	0.063	-0.030	0.048	0.938	-5.208	-1.690	0.095	-0.830	-1.080	0.282
Dexia Sustainable North America Classic C	North America	-0.145	0.061	-0.026	0.041	0.653	-7.515	-1.770	0.080	-1.283	-1.380	0.171
Folksam Aktiefond Europa	Europe	-0.192	0.068	-0.029	0.048	1.014	-2.550	-1.800	0.076	-0.498	-1.420	0.160
Folksam Aktiefond USA	North America	-0.181	0.069	-0.034	0.054	1.080	-1.185	-0.560	0.575	-0.210	-0.450	0.654
Folksam Globala Aktiefond	World	-0.164	0.050	-0.030	0.045	0.982	-1.396	-0.960	0.340	-0.222	-0.590	0.560
Folksam LO Världen	World	-0.169	0.051	-0.032	0.048	1.046	-1.060	-0.730	0.470	-0.245	-0.640	0.521
Folksams Tjänstemannafond Världen	World	-0.168	0.051	-0.032	0.048	1.043	-1.214	-0.840	0.402	-0.311	-0.830	0.409
JPM Global Socially Responsible Fund A	World	-0.247	0.085	-0.029	0.057	0.866	-4.152	-0.620	0.540	-2.860	-1.650	0.103
SAM Sustainable Leaders Fund	World	-0.166	0.046	-0.031	0.046	0.964	-3.212	-1.270	0.206	-1.623	-2.570	0.012
SEB Etisk Europafond Lux SEK	Europe	-0.191	0.061	-0.026	0.049	0.973	0.508	0.190	0.850	-0.268	-0.400	0.690
SEB Etisk Globalfond	World	-0.175	0.064	-0.032	0.049	1.047	-1.388	-0.730	0.466	-0.257	-0.520	0.605
SEB Etisk Globalfond - Lux	World	-0.174	0.061	-0.033	0.049	1.049	-2.353	-1.270	0.208	-0.122	-0.250	0.802
SEB Stiftelsefond Utland	World	-0.172	0.056	-0.032	0.047	1.008	-2.824	-1.740	0.085	-0.132	-0.310	0.756
UBS Equity Fund - Eco Performance B	World	-0.176	0.062	-0.031	0.053	1.081	0.646	0.190	0.853	-1.649	-1.860	0.067
Öhman Etisk Index Europa	Europe	-0.183	0.059	-0.028	0.046	0.959	-2.074	-1.300	0.196	-0.249	-0.630	0.532
Öhman Etisk Index USA	North America	-0.185	0.067	-0.032	0.050	1.001	-1.709	-0.770	0.442	-0.587	-1.210	0.229
Mean		-0.179	0.060	-0.031	0.048	0.987	-2.778			-0.707		
Median		-0.175	0.061	-0.031	0.048	1.001	-2.550			-0.393		

Appendix 5. Performance of regular funds

Name	Inv. Uni.	Average Monthly Excess Returns				Fund Performance Jensen's Alpha				Market Timing Ability Treyner-Mazuy		
		Min	Max	Mean	St. Dev.	β	α (%)	t-value	p > t	β_T	t-value	p > t
ABN AMRO Amerika	North America	-0.170	0.065	-0.035	0.047	0.911	-8.610	-3.230	0.002	-0.539	-0.920	0.361
AMF Pensions Europafond - Euro	Europe	-0.213	0.093	-0.027	0.052	1.002	-3.138	-1.610	0.112	0.237	0.550	0.585
Catella Europafond	Europe	-0.210	0.084	-0.028	0.060	0.921	-9.129	-3.810	0.000	-0.252	-0.480	0.636
Danske Fonder Sverige/Europa	Europe	-0.175	0.076	-0.028	0.053	1.082	1.258	0.450	0.657	-0.337	-0.540	0.591
Danske Fonder Utland	Europe	-0.180	0.054	-0.029	0.047	1.052	4.196	1.150	0.255	0.198	0.240	0.808
Handelsbankens Amerikafond	North America	-0.177	0.069	-0.034	0.050	1.012	-4.124	-1.800	0.076	0.068	0.130	0.895
Handelsbankens Europafond	Europe	-0.173	0.061	-0.030	0.050	1.037	-2.485	-1.070	0.289	-0.415	-0.810	0.422
Handelsbankens Utlandsfond	World	-0.166	0.055	-0.033	0.048	1.066	1.530	0.700	0.486	-0.379	-0.690	0.489
HQ Utlandsfond	World	-0.154	0.048	-0.031	0.049	1.182	4.925	1.410	0.164	0.427	0.490	0.627
Länsförsäkringar Europafond	Europe	-0.202	0.060	-0.031	0.051	1.071	1.388	0.550	0.585	0.684	1.090	0.281
Länsförsäkringar Globalfond	World	-0.178	0.062	-0.032	0.048	0.979	-3.373	-1.870	0.065	0.115	0.260	0.799
Länsförsäkringar Mega Europa	Europe	-0.201	0.063	-0.031	0.051	1.032	-2.548	-1.330	0.187	0.407	0.850	0.396
Länsförsäkringar Nordamerikafond	North America	-0.158	0.061	-0.036	0.047	1.058	-3.680	-1.970	0.052	-0.202	-0.430	0.666
Länsförsäkringar Pension 2015	World	-0.171	0.056	-0.029	0.052	1.065	-2.903	-1.530	0.131	-0.103	-0.220	0.829
Länsförsäkringar Pension 2020	World	-0.173	0.057	-0.029	0.052	0.985	-3.264	-1.870	0.065	-0.927	-2.190	0.032
Länsförsäkringar Pension 2025	World	-0.172	0.057	-0.029	0.052	0.977	-0.820	-0.390	0.701	-0.158	-0.300	0.768
Länsförsäkringar Pension 2030	World	-0.173	0.057	-0.029	0.052	0.967	-3.506	-2.420	0.018	-0.266	-0.740	0.464
Länsförsäkringar Pension 2035	World	-0.173	0.057	-0.029	0.052	0.977	-3.705	-2.630	0.010	-0.379	-1.080	0.283
Länsförsäkringar Pension 2040	World	-0.173	0.057	-0.029	0.052	0.978	-3.051	-2.230	0.028	-0.451	-1.330	0.187
Länsförsäkringar Totalfond	World	-0.181	0.067	-0.031	0.051	1.029	-2.846	-1.620	0.109	-0.275	-0.600	0.552
Nordea Avtalspensionsfond Maxi	World	-0.191	0.063	-0.030	0.053	1.007	-2.192	-0.780	0.437	-0.978	-1.350	0.182
Nordea Europafond	Europe	-0.205	0.054	-0.029	0.047	1.010	-2.793	-1.300	0.198	-0.740	-1.330	0.188
Nordea Global	World	-0.194	0.052	-0.032	0.051	1.077	3.273	1.220	0.226	-0.448	-0.640	0.524
Nordea Nordamerikafond	North America	-0.208	0.100	-0.032	0.055	1.085	3.742	1.390	0.169	-0.528	-0.750	0.456
Nordea Premiepensionsfond 1945-49	World	-0.192	0.061	-0.030	0.053	1.079	3.602	1.330	0.187	-0.430	-0.610	0.545
Nordea Premiepensionsfond 1950-54	World	-0.192	0.061	-0.030	0.053	1.079	3.604	1.340	0.184	-0.490	-0.700	0.487
Nordea Premiepensionsfond 1955-59	World	-0.193	0.062	-0.030	0.053	1.081	3.466	1.290	0.201	-0.560	-0.800	0.426
Nordea Premiepensionsfond 1960-64	World	-0.192	0.061	-0.030	0.053	1.079	3.210	1.190	0.237	-0.553	-0.790	0.434
Nordea Premiepensionsfond 1965-69	World	-0.193	0.065	-0.030	0.053	1.051	0.162	0.060	0.953	-0.855	-1.210	0.231
Nordea Premiepensionsfond 1970-74	World	-0.193	0.063	-0.030	0.053	1.118	3.004	1.190	0.236	-0.646	-0.990	0.327
Nordea Premiepensionsfond 1975-79	World	-0.194	0.062	-0.030	0.053	1.081	0.364	0.170	0.862	-0.649	-1.200	0.235
Nordea Premiepensionsfond 1980-84	World	-0.194	0.063	-0.030	0.055	1.122	3.472	1.380	0.170	-0.697	-1.070	0.288
Nordea Selekt Europa	Europe	-0.186	0.064	-0.027	0.048	1.124	3.716	1.460	0.147	-0.714	-1.080	0.282
SEB Nordamerika Medelstora Bolagsfond	North America	-0.192	0.093	-0.029	0.056	1.124	3.562	1.410	0.163	-0.690	-1.050	0.298
Skandia Europa	Europe	-0.177	0.049	-0.029	0.046	1.120	3.561	1.430	0.157	-0.655	-1.010	0.315
Skandia USA	North America	-0.179	0.073	-0.035	0.051	1.121	3.645	1.440	0.153	-0.675	-1.030	0.307
Swedbank Robur Amerikafond	North America	-0.188	0.071	-0.034	0.052	1.123	3.599	1.430	0.157	-0.684	-1.040	0.300
Swedbank Robur Europafond	Europe	-0.188	0.062	-0.029	0.046	1.127	3.377	1.330	0.187	-0.758	-1.150	0.253
Swedbank Robur Europafond MEGA	Europe	-0.187	0.062	-0.029	0.046	1.147	4.395	1.610	0.111	-0.572	-0.810	0.423
SPP Generation 80-tal	World	-0.170	0.056	-0.029	0.053	1.104	4.690	1.600	0.114	-1.220	-1.620	0.110
Swedbank Robur Globalfond	World	-0.176	0.052	-0.033	0.047	1.011	-3.345	-2.010	0.048	-0.319	-0.730	0.466
Swedbank Robur Globalfond MEGA	World	-0.174	0.053	-0.032	0.047	1.005	-2.944	-1.830	0.071	-0.354	-0.840	0.401
Mean		-0.184	0.063	-0.030	0.051	1.054	0.078			-0.399		
Median		-0.184	0.062	-0.030	0.052	1.066	0.811			-0.449		

Appendix 6. Performance of replicating portfolios

Name	Inv. Uni.	Average Monthly Excess Returns				Fund Performance Jensen's Alpha				Market Timing Ability Treyner-Mazuy		
		Min	Max	Mean	St. Dev.	β	α (%)	t-value	p > t	β_T	t-value	p > t
ABN AMRO Amerika	North America	-0.178	0.066	-0.036	0.048	0.936	-8.407	-2.970	0.004	-0.424	-0.680	0.500
AMF Pensions Europafond - Euro	Europe	-0.213	0.094	-0.028	0.052	1.031	-2.812	-1.300	0.196	0.322	0.680	0.501
Catella Europafond	Europe	-0.219	0.099	-0.028	0.062	0.943	-9.177	-3.690	0.000	-0.130	-0.240	0.814
Danske Fonder Sverige/Europa	Europe	-0.175	0.081	-0.028	0.053	1.117	1.960	0.630	0.529	-0.441	-0.650	0.521
Danske Fonder Utland	Europe	-0.179	0.062	-0.029	0.048	1.052	4.196	1.150	0.255	0.198	0.240	0.808
Handelsbankens Amerikafond	North America	-0.187	0.073	-0.034	0.052	1.026	-4.258	-1.750	0.085	0.150	0.280	0.782
Handelsbankens Europafond	Europe	-0.175	0.067	-0.031	0.052	1.071	-2.169	-0.840	0.403	-0.413	-0.730	0.470
Handelsbankens Utlandsfond	World	-0.174	0.059	-0.033	0.049	1.067	1.378	0.610	0.543	-0.450	-0.800	0.427
HQ Utlandsfond	World	-0.158	0.049	-0.032	0.050	1.231	6.298	1.680	0.097	0.543	0.580	0.564
Länsförsäkringar Europafond	Europe	-0.207	0.073	-0.032	0.053	1.081	1.742	0.650	0.518	0.821	1.230	0.221
Länsförsäkringar Globalfond	World	-0.186	0.062	-0.033	0.049	0.993	-3.082	-1.580	0.118	0.367	0.760	0.452
Länsförsäkringar Mega Europa	Europe	-0.206	0.074	-0.032	0.053	1.068	-2.208	-1.020	0.309	0.575	1.070	0.287
Länsförsäkringar Nordamerikafond	North America	-0.164	0.062	-0.037	0.048	1.092	-3.291	-1.590	0.117	-0.161	-0.310	0.757
Länsförsäkringar Pension 2015	World	-0.175	0.064	-0.029	0.053	1.100	-2.596	-1.220	0.225	-0.050	-0.090	0.925
Länsförsäkringar Pension 2020	World	-0.177	0.066	-0.029	0.053	1.018	-2.841	-1.510	0.134	-1.018	-2.230	0.028
Länsförsäkringar Pension 2025	World	-0.176	0.066	-0.029	0.053	0.998	-0.687	-0.310	0.761	-0.210	-0.370	0.710
Länsförsäkringar Pension 2030	World	-0.177	0.065	-0.029	0.053	1.007	-3.003	-1.860	0.066	-0.226	-0.560	0.577
Länsförsäkringar Pension 2035	World	-0.177	0.065	-0.029	0.053	1.009	-3.449	-2.170	0.033	-0.339	-0.860	0.394
Länsförsäkringar Pension 2040	World	-0.177	0.066	-0.029	0.053	1.010	-2.730	-1.780	0.079	-0.416	-1.090	0.278
Länsförsäkringar Totalfond	World	-0.187	0.079	-0.031	0.052	1.055	-2.676	-1.370	0.173	-0.194	-0.380	0.704
Nordea Avtalspensionsfond Maxi	World	-0.195	0.064	-0.031	0.054	1.026	-2.109	-0.720	0.472	-1.100	-1.460	0.148
Nordea Europafond	Europe	-0.215	0.061	-0.030	0.049	1.037	-2.485	-1.060	0.293	-0.849	-1.400	0.165
Nordea Global	World	-0.199	0.055	-0.032	0.052	1.097	3.915	1.380	0.172	-0.519	-0.700	0.486
Nordea Nordamerikafond	North America	-0.214	0.120	-0.033	0.057	1.105	4.436	1.550	0.125	-0.607	-0.810	0.418
Nordea Premiepensionsfond 1945-49	World	-0.196	0.064	-0.030	0.055	1.099	4.283	1.490	0.139	-0.502	-0.670	0.505
Nordea Premiepensionsfond 1950-54	World	-0.196	0.064	-0.030	0.055	1.099	4.290	1.500	0.136	-0.564	-0.760	0.450
Nordea Premiepensionsfond 1955-59	World	-0.197	0.065	-0.030	0.055	1.101	4.147	1.460	0.149	-0.641	-0.860	0.390
Nordea Premiepensionsfond 1960-64	World	-0.196	0.063	-0.030	0.054	1.098	3.876	1.360	0.179	-0.630	-0.850	0.400
Nordea Premiepensionsfond 1965-69	World	-0.196	0.068	-0.030	0.055	1.072	0.803	0.270	0.786	-0.961	-1.260	0.211
Nordea Premiepensionsfond 1970-74	World	-0.197	0.065	-0.030	0.055	1.142	3.653	1.380	0.172	-0.730	-1.060	0.292
Nordea Premiepensionsfond 1975-79	World	-0.198	0.065	-0.031	0.055	1.112	0.964	0.430	0.667	-0.764	-1.320	0.190
Nordea Premiepensionsfond 1980-84	World	-0.197	0.065	-0.030	0.056	1.147	4.130	1.570	0.121	-0.759	-1.110	0.271
Nordea Selekt Europa	Europe	-0.195	0.074	-0.027	0.049	1.150	4.396	1.640	0.105	-0.779	-1.120	0.266
SEB Nordamerika Medelstora Bolagsfond	North America	-0.192	0.093	-0.029	0.056	1.149	4.202	1.580	0.118	-0.760	-1.100	0.275
Skandia Europa	Europe	-0.182	0.055	-0.030	0.048	1.145	4.204	1.610	0.112	-0.717	-1.050	0.295
Skandia USA	North America	-0.183	0.076	-0.035	0.052	1.147	4.299	1.620	0.109	-0.736	-1.070	0.289
Swedbank Robur Amerikafond	North America	-0.193	0.080	-0.035	0.054	1.149	4.264	1.610	0.112	-0.744	-1.080	0.283
Swedbank Robur Europafond	Europe	-0.194	0.075	-0.030	0.048	1.152	4.044	1.520	0.133	-0.831	-1.200	0.232
Swedbank Robur Europafond MEGA	Europe	-0.192	0.074	-0.029	0.048	1.173	5.043	1.760	0.082	-0.603	-0.810	0.421
SPP Generation 80-tal	World	-0.171	0.059	-0.029	0.054	1.120	5.114	1.660	0.102	-1.235	-1.550	0.125
Swedbank Robur Globalfond	World	-0.179	0.055	-0.033	0.048	1.035	-3.254	-1.820	0.073	-0.381	-0.810	0.418
Swedbank Robur Globalfond MEGA	World	-0.178	0.054	-0.033	0.048	1.028	-2.829	-1.630	0.107	-0.421	-0.930	0.353
Mean		-0.189	0.069	-0.031	0.052	1.078	0.51			-0.413		
Median		-0.189	0.065	-0.030	0.053	1.087	1.171			-0.476		

Appendix 7. Results from diagnostic tests

Test	SRI funds		Regular funds		Replicating portfolios	
	H0 Rejected	H0 Not rejected	H0 Rejected	H0 Not rejected	H0 Rejected	H0 Not rejected
Jarque-Bera test						
H0: Normally distributed error term	4	19	12	30	21	21
Breusch-Pagan/Cook-Weisberg test						
H0: Heteroscedastic residuals	20	3	26	16	12	30
Durbin's alternative test						
H0: Autocorrelation in residuals	8	15	7	35	9	33