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THE PERFORMANCE OF SOCIALLY RESPONSIBLE INVESTMENTS: INVESTMENT FUNDS AND INDICES

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1. Introduction

Investments based on social, ethical and environmental criteria have increased significantly in the last decades. This is particularly true for the United States but also for Sweden, United Kingdom, the Netherlands and Switzerland. According to BAUER et al. (2002) about 2.3% of total mutual fund assets in the United States, i.e. 153 bn U.S. dollar, have been invested in 230 so called socially responsible investment funds at the end of the year 2000. In other countries, e.g. Germany (0.04%) and France (0.01%) this market segment is still relatively small but the market share is growing.

The development of socially responsible investing (SRI)[1] in the United States has also attracted the interest of academic finance. The empirical analy-

sis of SRI funds dates back as early as 1972 to a study of MOSKOWITZ. Since then numerous studies investigated if SRI funds can reach the same performance as not restricted investment funds. The results of many of these studies show that SRI funds do not under-perform on average traditionally managed funds. This is an interesting result as SRI funds only use a subset of the full investment universe.

The aim of this study is the evaluation of the performance of SRI equity investment funds in the United States, Germany and Switzerland and of well-known SRI equity indices such as the Domini 400-index. As performance measure we use Jensen's alpha. In addition to earlier studies a broader set of benchmark assets is considered (not only blue chip but also small cap stocks). Regarding the analysis of the investment funds possible distortions due to market timing are taken into account. To measure conditional performance the approach of FERSON and SCHADT (1996) is applied.

The performance analysis of the SRI investment funds tests jointly the performance of the underlying assets and the quality of the fund management. The performance analysis of the SRI indices avoids this and other methodological problems and shows more clearly whether SRI equities have a better or worse outcome than traditional investments that use the whole investment universe.

Throughout this paper a pragmatic definition of SRI investments is applied, as all funds and indices that declare themselves as “socially responsible” are included in the analysis. These funds and indices use a (different) set of social, ethical and environmental criteria to select specific equities. The criteria are either used to pick specific stocks out of the investment universe (positive criteria) or to delete specific stocks (negative criteria). Positive criteria are for example a low level of pollutant emissions, equal employment opportunities or good workplace conditions. Usual negative criteria are the production of alcohol, tobacco, nuclear power or military weapons.

The paper is organised as follows. In section 2 we give a short review of the major studies in this field of research. Section 3 describes the data, i.e. the investment funds and indices under consideration. In section 4 the performance of investment funds and indices is analysed. Section 5 concludes. The appendix contains all tables that are discussed in the text.

2. Review of the Literature

The aim of this literature survey is to give a short overview of the methods and major results of earlier studies on performance measurement of investments in socially screened equities.[2] The review concentrates on studies on SRI investment funds and SRI indices. This serves as a starting point of our own analyses in the subsequent sections.

The major question of the studies on the performance of SRI investment funds is whether these funds perform better or worse than traditional investment funds that have no restricted investment universe. SRI investment funds use a set of social, ethical and environmental criteria to select equities. These criteria are either used to choose specific stocks out of the investment universe (positive criteria) or to delete specific stocks (negative criteria). Positive criteria are for example low pol-

lution emissions, equal employment opportunities and good workplace conditions. Usual negative criteria are the production of alcohol, tobacco, nuclear power or weapons.

From the point of view of portfolio theory a restricted investment universe should result in a lower risk-adjusted return. Even a very smart SRI investment strategy can only be as good as a traditional investment strategy because SRI investment opportunities are a subset of the total investment universe. Therefore, a traditional investment fund should always be able to use the same investment strategy as a SRI fund, but not vice versa.

Several studies on the performance of SRI investments apply a so called matching approach. They compare the performance of SRI and non-SRI investment funds which otherwise have similar characteristics e.g. concerning investment universe, fund size or fund age. The aim of this approach is to consider appropriately management and transaction costs when comparing the performance.

Important studies using a matching approach are MALLIN et al. (1995) and GREGORY et al. (1997) who analyse British investment funds, a study of STATMAN (2000) on U.S. funds and KREANDER et al. (2000) who investigate 40 investment funds from seven countries.

KREANDER et al. (2000) is the most advanced study. The authors apply four criteria for the matching procedure: age, size, country and investment universe. Like most of the earlier studies they use Jensen's alpha, Sharpe ratio and Treynor ratio as performance measures. In the regression equation for Jensen's alpha a measure for market timing is included.[3] As market timing of the fund management can significantly bias the estimation of Jensen's alpha this is an important improvement compared to earlier studies. The statistical tests concerning the differences in the performance measures show that the Sharpe and Treynor ratios of the conventional funds are slightly higher but not significant whereas the Jensen's alpha of

the SRI funds is higher but only at the 10% significance level. The authors conclude that SRI and conventional funds exhibit a very similar performance.

There are some shortcomings of the study of KREANDER et al. The authors use the MSCI World index as benchmark. This choice may not be appropriate for all funds because of different strategies concerning the regional diversification.[4] The authors, in addition, do not use a small cap market index to cope with the small cap bias of most SRI funds. As the authors show in the appendix that the size difference between the SRI funds and the assigned conventional fund is significant at the 10% level, the interpretation of their results should be done with some caution.

Most of the studies instead use time-series regressions based on a factor model without applying a matching approach. The common performance measure is Jensen's alpha, i.e. the constant of a regression model that uses one or more factors to explain the fund returns. LUTHER et al. (1992) analyse British ethical funds, HAMILTON et al. (1993) U.S. funds and WHITE (1995) German and U.S. funds using a simple regression against a market index.

LUTHER and MATATKO (1994) is the first study that includes not only a broad market index but also an index for companies with a low market capitalisation ("small cap stocks"). They conclude that a regression based on these two benchmarks is more appropriate for performance measurement because many SRI equity funds invest a larger part of their portfolio in small cap stocks.

A recent study is BAUER et al. (2002). The authors consider 32 British, 16 German and 55 U.S. investment funds that apply a social screening. The authors compare a portfolio of all SRI funds with a portfolio of all conventional funds of each country.[5] They use the 4-factor model of CARHART (1997) in their investigation. The first three factors are those of the Fama-French model[6] and the fourth factor captures the effect of momentum. BAUER et al. also use a condi-

tional version of this model. Here they consider time-varying factor sensitivities where the time variation depends on the influence of four pre-determined instruments. The aim of this last approach is to include publicly available information which can be used by the fund management for dynamic investment strategies.

The main findings of BAUER et al. are: (1) German and U.S. SRI funds under-perform both their relevant indices and the conventional funds, whereas UK funds slightly outperform. But all these differences are not significant. (2) The SRI funds seem to have investment styles that are different from the conventional funds. For example, the funds are tilted towards companies with a low book-to-market value (= growth stocks) and towards companies with a low market capitalisation. The latter result is a confirmation of the findings of earlier studies.

Only a few studies analyse the performance of SRI indices. These are particularly SAUER (1997), DiBARTOLOMEO and KURTZ (1999) and STATMAN (2000) who investigate the performance of the Domini 400 Social-index and GARZ et al. (2002) who analyse the Dow Jones Sustainability Index (DJSI) for Europe. The major result concerning the Domini 400 Social index is that the performance is comparable to those of the S&P 500-index. For the DJSI Europe index GARZ et al. (2002) find a slightly significant but small out-performance compared to the DJ STOXX 600-index.

The review of the literature on the performance of SRI investment funds has revealed some interesting results. First of all, most of the studies agree that SRI funds have a similar performance than conventional funds. This result is well founded and reliable as the studies use different methods (from very simple one-factor models to three- and four-factor models with time-varying coefficients), investigate different time periods and different countries. The hypothesis that SRI funds must have a worse performance than conventional funds due to the restricted investment universe is

therefore rejected. But the SRI funds also exhibit no out-performance.

Another important result is that SRI funds differ significantly in their investment strategy relative to conventional funds. The studies particularly find that SRI funds have an overweight in companies with a low market capitalisation.

But the findings particularly of the early studies on SRI funds should be interpreted with some caution as these studies have shortcomings regarding the performance measure. For example only KREANDER et al. (2000) consider market timing in their regression model and only BAUER et al. (2002) apply a conditional model. The neglect of these two model characteristics can result in biased estimates of the model parameters and thus also in misleading measures of out- or under-performance.

The studies using matching procedures suffer from an only insufficient approximation of the fund characteristics. Particularly STATMAN (2000) and MALLIN et al. (1995) use a too small set of matching criteria. These two studies can probably approximate the transaction costs of the funds quite well but the matched pairs of funds may still differ, e. g. in their investment universe. Only KREANDER et al. (2000) consider the investment universe of the funds in detail.

Regarding the problems in the application of the matching approach it seems to be more appropriate to analyse the underlying assets directly. This can be done by using SRI indices which are now available for different countries and regions for sufficiently long time periods. These indices measure the performance of assets that are selected by SRI screening procedures and can therefore be used to test the performance of SRI assets. The suppliers of the SRI indices as for example Dow Jones, FTSE, Calvert and KLD[7] use similar sets of social, ethical and environmental criteria which are comparable to the criteria applied by the SRI investment funds.

The analysis of SRI indices instead of investment funds has two important advantages: (1) it avoids

methodological problems because market timing and the use of publicly available information as instruments for conditional estimations have not to be considered and (2) it tests directly the performance of the SRI assets and these tests are not distorted by (transaction) costs or the ability of the fund management.

3. Characteristics of the Data

In the following sections the performance of SRI investment funds and SRI indices is analysed. The study includes the major SRI investment funds from the United States, Germany and Switzerland. These are 30 U.S. funds and 16 funds from Germany and Switzerland. In addition, 10 SRI indices are investigated. The time series selected represent the most important and best-known SRI funds and indices which are part of earlier studies and publications of SRI organisations.

The indices and funds comprise stocks that are selected applying social, ethical and environmental criteria. The SRI funds have a weighting of equities of at least 60%. Most of the analysed investment funds have an average equity weighting of more than 80%-90% and invest only in equities or cash. The data are primarily collected using the Thomson Financial Datastream database. Some of the indices (Domini 400 Social, Calvin, Dow Jones Sustainability Indices, Naturaktienindex (NAI)) have been provided by the suppliers of these indices.

The price data of the investment funds include all cash payments to the investor and all these distributions are reinvested in the fund. The prices are net of all management fees and transaction costs. Load factors are not considered. The fund prices measure therefore the net asset value of the funds. The SRI indices and all benchmark indices are performance indices and include all cash payments (e.g. dividends) to the investor. The NAI is a price index which only takes the stock prices into account. The U.S. fund prices and the SRI in-

dices are calculated in U.S. dollar, whereas the prices of the German and Swiss funds are measured in German mark and euro (from 1999 on).

An important selection criterion for the SRI investment funds is the length of the time series. Only funds for which data are available before May 2000 have been selected. The end date of the series is September 2002. The minimum length of the price series is therefore 30 months. For all calculations the full available price series have been used, so that for most investment funds and indices the sample period is much longer. For the United States this selection criterion excludes only a few of the existing SRI funds but for Germany and Switzerland more than 20 new established funds could not be included in the study. Many of these new funds have been launched during 2001 so that their price series is too short to allow statistically sound inference. Nevertheless, some of the fund and index series used are also quite short and in these cases the results may suffer from relatively imprecise estimates.

A major concern of many performance studies is the so called survivorship bias. This causes an overestimation of the true performance regarding the universe of investment funds if funds that have been closed in the past are not included in the investigation. Our sample of SRI investment funds seems to be free of a survivorship bias as this field of business is still strongly growing in many countries with the result that older funds have not yet been closed to our knowledge.

But a survivorship bias could exist regarding the indices because all indices are regularly restructured after some time. In this restructuring process the stocks which have been delisted or exhibited a strong decrease in market capitalisation below a certain threshold level are usually dropped. Therefore the SRI indices as well as the benchmark indices may be affected by a survivorship bias.

Tables 1–3 list all the investment funds and indices included in the study, show the region in which the fund invests and the first date for which prices are available by Thomson Financial Data-

stream. In column 6 of these tables the specific social, ethical, or environmental selection criteria of the funds are listed. These SRI criteria are usually combined with financial criteria (such as the expected profitability of the companies) in the stock selection process.

Table 1 shows the German and Swiss investment funds. All of these 16 funds apply a world-wide diversification of their portfolio. This is in contrast to the U.S. funds (table 2) which in most cases concentrate on U.S. stocks. Only 4 of the U.S. funds invest internationally. Looking at the SRI investment criteria of the funds it seems that the U.S. investment funds are more homogeneous than their German and Swiss counterparts. The U.S. funds apply a broad set of positive and negative criteria. Almost all of these funds exclude companies which are engaged in businesses like production of alcohol, gambling, nuclear energy, tobacco, and military weapons. Many of these funds also consider criteria concerning the environment, workplace conditions and discrimination of minorities. Some of the German and Swiss SRI funds concentrate instead only on environmental friendly products and technologies. Overall the U.S. funds have a much stronger emphasis on social and ethical criteria.

Tables 4a–c give a first overview of the mean returns and the performance of the SRI funds and indices. All returns in this study are logarithmic returns based on monthly data. The performance is calculated using the Sharpe ratio (SR). The Sharpe ratio measures the return above the risk-free interest rate divided by the total risk of the investment:

$$SR = \frac{\mu - r_f}{\sigma} \quad (1)$$

μ = mean logarithmic return, r_f = logarithm of the risk-free interest rate (mean), σ = standard deviation of the logarithmic returns. The risk-free interest rates are the 1-month Fibor for German and Swiss funds and the 1-month U.S. interbank of-

ferred rate for U.S. funds as well as the SRI indices. The Sharpe ratios of the funds and indices are compared to the Sharpe ratio for the MSCI World index for the same period. The calculations use the full available data history of the SRI funds and indices.

Table 4a reveals that the majority of the German and Swiss funds have both a lower mean return compared to the MSCI index and also a lower Sharpe ratio. Only 4 funds have a Sharpe ratio above or equal to the MSCI index. For the U.S. funds the situation is similar: only 9 out of 30 funds have at least a Sharpe ratio as the MSCI index. In contrast, 8 SRI indices performed better than the MSCI World index. This indicates that the underlying assets represented by the indices seem to perform similar (or even better) than conventional assets, whereas the investment funds are in most cases not able to earn an extra-return which compensates the costs of the fund management.

4. Performance Analysis

The performance of the SRI investment funds and indices is investigated using different regression approaches. The aim is to measure Jensen's alpha i.e. the extra-return that is not explained by the risk exposure of the fund. Jensen's alpha of the SRI investment funds is estimated by three approaches.

The first approach uses two benchmark indices, a blue chip index and a small cap index. The second approach considers, in addition, market timing activities of the fund management and the third approach expands the second approach by including instrumental variables for conditional performance estimation.

A result of the earlier studies is that SRI funds are significantly tilted towards companies with a low market capitalisation.[8] Therefore, the investment universe of the benchmark should not only include a market index for companies with

high market capitalisation but also a small cap equity index.[9]

Thus, the first model version for estimating the performance is:

(Version 1 – Funds)

$$re_{i,t} = \alpha_i + \beta_{1i}re_{B,t} + \beta_{2i}re_{S,t} + \varepsilon_{i,t} \quad (2)$$

re denotes the excess return of either fund i or the benchmark indices (B = blue chip index, S = small cap index), which is defined as:

$$re_{x,t} = r_{x,t} - r_{f,t-1}$$

$$\text{with } x = i, B \text{ or } S \quad (3)$$

and

$$r_{x,t} = \ln(I_{x,t}) - \ln(I_{x,t-1}),$$

$$r_{f,t-1} = \ln(1 + \text{risk-free interest rate}_{t-1}/100)/12 \quad (4)$$

and

I = index level of either fund i or one of the benchmark indices.

The benchmark indices are selected in order to approximate the investment universe of the SRI funds and indices. For all globally investing funds the blue-chip benchmark index is the MSCI World index and the small cap index is the world index of Salomon Smith Barney which covers international companies with a market capitalisation below 500 mn U.S. dollar. The U.S. benchmarks are the Standard & Poor's 500-index for the blue chip stocks and the Wilshire Small Cap 250 index of small cap stocks. The α_i -coefficient measures whether the SRI fund or index has a performance that differs from the performance of a passive portfolio that consists of the two benchmark indices with the respective weights β_{1i} and β_{2i} .

If the fund management has market timing abilities model version 1 results in a biased estimation of Jensen's alpha.[10] To consider market timing in the regression we apply the usually used Treynor-Mazuy approach.[11]

(Version 2 – Funds)

$$re_{i,t} = \alpha_i + \beta_{1i}re_{B,t} + \beta_{2i}re_{S,t} + \gamma_{1i}(re_{B,t})^2 + \gamma_{2i}(re_{S,t})^2 + \varepsilon_{i,t} \quad (5)$$

A positive γ means that the fund manager is able to time the market, whereas a negative γ shows that the manager invests less in upward markets and more in downward markets. This can be seen from the derivative of the SRI fund or index returns with respect to the returns of the benchmark indices, e.g. $\partial re_{i,t} / \partial re_{B,t} = \beta_{1i} + 2\gamma_{1i}re_{B,t}$. Equation (5) measures market timing abilities for both benchmark indices.

Model versions 1 and 2 give unconditional estimations of Jensen’s alpha. If the fund management can forecast market movements by publicly available information then the sensitivities of the funds on the market returns should be time-varying. Thus, equations (2) and (5) can result in biased estimates of the performance due to a neglect of this time variation. In model version 3 the approach of FERSON and SCHADT (1996) is applied using instrumental variables that approximate changing market conditions.

(Version 3 – Funds)

$$re_{i,t} = \alpha_i + \beta_{1i}re_{B,t} + \beta_{2i}re_{S,t} + \gamma_{1i}(re_{B,t})^2 + \gamma_{2i}(re_{S,t})^2 + \sum_{j=1}^J (\lambda_{jB}z_{j,t-1}re_{B,t} + \lambda_{jS}z_{j,t-1}re_{S,t}) + \varepsilon_{i,t} \quad (6)$$

The J instrumental variables $z_{j,t-1}$ are predetermined from month $(t-1)$. We use $J=2$ instruments: the U.S. long-term interest rate and the U.S. term spread i.e. the difference between the long-term and the short-term interest rate. The U.S. long-term interest rate is a proxy for the global condition on the bond markets and the term spread is a leading indicator for the business cycle. As usual the instrumental variables are the deviations of the original variables from their unconditional mean. If, for example, only λ_{1B} is significant then the reaction of $re_{i,t}$ to changes in e.g. $re_{B,t}$ would be: $\partial re_{i,t} / \partial re_{B,t} = (\beta_{1i} + \lambda_{1B}z_{1,t-1}) + 2\gamma_{1i}re_{B,t}$ and there-

fore depends systematically on the value of the instrument $z_{1,t-1}$ in period $(t-1)$.

As market timing and time-varying betas due to publicly available information are irrelevant for the performance measurement of the SRI indices two simpler approaches are used for analysing the SRI indices:

(Version 1 – Indices)

$$re_{i,t} = \alpha_i + \beta_{1i}re_{B,t} + \varepsilon_{i,t} \quad (7)$$

(Version 2 – Indices)

$$re_{i,t} = \alpha_i + \beta_{1i}re_{B,t} + \beta_{2i}re_{S,t} + \varepsilon_{i,t} \quad (8)$$

In equation (7) only a blue-chip benchmark index is used whereas version 2 also includes a small cap index. As benchmark indices those indices are chosen that match the investment universe of the SRI indices sufficiently well.

For the Calvin index, the S&P 500 “Environmental Services” and the Domini 400 Social index the Standard & Poor’s 500 is the blue-chip benchmark index. For the Naturaktienindex (NAI) and the Datastream world index “Environmental control” the MSCI World index is most appropriate. As the NAI is a price index here the MSCI World price index is chosen as benchmark. The blue-chip benchmarks for the FTSE4Good-indexes are the FTSE All-World Developed, All-World Europe and Local U.S. index, respectively. The benchmarks for the Dow Jones Sustainability indices are the DJ STOXX 600-index for Europe and the DJ World-index. The small cap indices used in equation (8) are the Salomon Smith Barney indices for Europe and World which cover companies with a market capitalisation below 500 mn U.S. dollar. For the United States the Wilshire Small Cap 250 index is taken.

All five equations ((2) and (5) to (8)) are estimated using ordinary least squares. The standard errors are corrected for autocorrelation and heteroskedasticity using the Newey-West approach.[12] Tables 5a–c show the estimates of

Jensen's alpha for the funds and the indices. Although for many funds the alphas are negative there are only a few significant estimates. Concerning the German and Swiss funds the Fürst Fugger Sustainability fund, the SAM Sustainability Index fund and the Oppenheim DJ Sustainability World Index fund clearly under-perform using model version 3. All three funds have the Dow Jones Sustainability World index as benchmark. The Sun Life Ecological Portfolio also exhibits a negative performance but only at the 10% significance level. The results also show that the analysis is often hampered by a short time period. For example, the SAM Sustainability Pioneer Fund exhibits a relatively poor performance compared to the benchmarks ($\alpha = -2.373$), but the estimate is nevertheless insignificant.

As investment fund returns bear the costs of the fund management it is often the case in empirical studies that the performance of investment funds is worse than the corresponding benchmark. It is therefore a surprise that at least 3 out of 16 German and Swiss funds (model version 3) exhibit a positive though not significant alpha. The performance of the U.S. funds seems to be similar to their German and Swiss counterparts. Only one of the 30 funds has a positive but not significant alpha using model version 3. But there are 7 funds that significantly under-perform their benchmarks.

The test of the performance of an investment fund has a joint hypothesis: one part of the hypothesis is the out- or under-performance of the underlying assets and the other part is the ability of the fund management to create extra-returns higher than the costs of the fund. Therefore, the results of tables 5a and 5b cannot reveal which parts of the hypothesis are rejected.

A separate test of the performance of the underlying assets can be conducted by measuring Jensen's alpha for the SRI indices. Table 5c shows that only the Calvin index clearly under-performs the benchmarks using model version 2. The Europe-wide FTSE4Good-index exhibits also a

significantly negative alpha when model version 1 is applied. Six of the 10 SRI indices show a positive though insignificant alpha (model version 2). From a methodological point of view the two industrial sector indices from S&P and Datastream on environmental services and environmental control, respectively, are different compared to the true SRI indices because they only comprise the companies of a specific industrial sector without social, ethical or environmental screening. Thus, the vast majority of SRI indices exhibits a performance that is equal (or even slightly better) than the performance of the conventional benchmark indices.

Our results for the Domini 400 Social-index are comparable to those of SAUER (1997) and DiBARTOLOMEO and KURTZ (1999). They also find positive but not significant alphas which are of similar size than our estimates. But our estimations for the DJSI-index for Europe are partly at odds with those of GARZ et al. (2002). Whereas they found a positive and slightly significant alpha our results show insignificant alphas. This difference is astonishing as they use the same time period. But although the benchmarks used by GARZ et al. are comparable to ours they are not identical. As the time period for the estimation is rather short and the estimated alpha of GARZ et al. is only significant at the 10%-level the different results are not necessarily a contradiction.

Table 6a–b show the influence of both the blue chip and the small cap benchmark indices, the market timing-abilities of the fund managers and the overall fit of the model (R^2). The γ -coefficients in the equations (5) and (6) quantify the market timing concerning the blue chip and the small cap indices. If these coefficients are positive then the manager increases the market exposure when the market index rises and becomes more prudent when the market index decreases. The outcomes of the regressions show instead that the managers of the German and Swiss SRI funds have relatively bad timing abilities as many of them in-

crease the market exposure in a downturn and decrease it in an upswing: 9 out of the 16 funds have at least one significantly negative γ -coefficient. Only two funds have the ability to time the market: the Pictet Global Sector Water fund and the Fürst Fugger Sustainability fund. For the U.S. funds most of the γ -coefficients are not significant, only 5 fund managers have negative and 3 positive timing capabilities. Overall the timing abilities of the U.S. fund managers can be characterised as neutral.

Another result from the tables 6a and 6b is the significant and strong influence of the small cap indices on the returns of the German and Swiss SRI funds. For 11 of the 16 funds the influence of the small cap index is even larger than the impact of the blue chip stocks. This is in sharp contrast to the U.S. funds as for most of these funds the influence of the blue chip index strongly dominates. Therefore, the U.S. funds are much less exposed to small company risk than the German and Swiss funds. This confirms the findings of BAUER et al. (2002). The overall fit of the fund return regressions is relatively good: the corrected R^2 is in most cases above 50% for the German and Swiss funds and at least for half of the U.S. funds.

The sensitivities of the SRI indices relative to the blue chip and small cap indices (table 6c) are more different amongst each other. There are five SRI indices for which the small cap stocks play a major role but for the others these sensitivities are either not significant or even negative. The negative signs for some of the benchmark indices could be an indication of multi-collinearity between the two benchmarks. The overall fit of the regressions (R^2) is relatively high in most cases. Only the two specialised sector-indices from Standard & Poor's and Datastream exhibit a very low R^2 . All other indices are relatively well explained by the two benchmark indices.

To sum up, most of the SRI assets – investment funds and indices – exhibit a similar performance compared to their benchmark indices. Only a few funds and indices significantly under-perform the

benchmarks. It is no surprise that most of the investment funds have a negative Jensen's alpha as the funds have a cost disadvantage compared to the benchmark indices. Thus, the results for the SRI indices are more appropriate to evaluate the performance of the underlying SRI equities. The performance of the SRI indices shows that an investor in SRI equities will earn – on average – a similar risk-adjusted return compared to an investment in conventional equities. Therefore, the restricted investment universe does not cause a reduction of the performance.

5. Conclusions

Socially responsible investment (SRI) funds are a special market segment of the asset management industry. Although this market segment is still relatively small it is fast growing in many countries. There are also an increasing number of banks, asset management companies, investment advisors and rating agencies that are specialised in this field of business. Therefore the economic performance of these specialised investment funds is of interest to the investors and the investment companies. In our study we investigate the performance of 16 German and Swiss funds and 30 U.S. funds that concentrate on socially responsible investing.

From the point of view of financial market theory it is interesting to examine if socially screened assets have the same performance than conventional assets. As SRI investment funds use only a subset of the total investment universe they should have the same or a worse performance than conventional funds. The performance analysis of SRI investment funds tests the combined hypothesis of the quality of the fund management and the performance of the underlying assets. We thus enlarge the performance analysis by the investigation of 10 SRI indices which represent the performance of socially screened assets only.

The review of the literature shows that SRI funds have, on average, a similar performance than conventional funds. The studies use different methods – from simple one-factor models to three- and four-factor models with time-varying coefficients-, investigate funds of different countries and analyse different time periods. Therefore it seems to be relatively reliable that the performance of SRI funds is comparable to those of conventional funds. Many studies find a significant overweight of SRI funds in companies with a low market capitalisation (small cap stocks). But the results particularly of the early studies on SRI funds should be interpreted with some caution as these studies have some shortcomings regarding the performance measure. Regarding the results of earlier studies we use two benchmark indices – a blue chip stock index and a small company stock index. The performance of the funds is measured by regression approaches that consider both market timing abilities of the fund management and publicly available information (= conditional performance measure).

The results of our own performance analyses show that most of the German, Swiss and U.S. SRI investment funds do not significantly underperform their benchmarks. A difference between the funds is that U.S. are more invested in blue chip stocks whereas the German and Swiss funds are stronger tilted towards smaller companies. The results of the performance analysis for the SRI indices show that only the Calvin index clearly underperforms the benchmarks, but also the Europe-wide FTSE4Good-index has a significantly negative Jensen's alpha in one of the two model versions used. But most of the SRI indices exhibit a positive (but insignificant) Jensen's alpha. Overall, the hypothesis that the performance of SRI assets is not worse than those of conventional assets could only be rejected for at most two of the ten SRI indices.

To summarise, socially screened assets seem to have no clear disadvantage concerning their performance compared to conventional assets. Their

risk-adjusted performance is similar to conventional assets and – on average – an investor does not have to expect a significantly lower performance due to the restricted investment universe.

APPENDIX

Table 1: German and Swiss Equity Funds: Overview

Name	Abbrev.	Region	Start Date ¹	Portfolio Characteristics
Activest Lux Ecotech	Activest	World	11/90	Environment friendly products or technologies
CS Fund Global Sustainability	CS Fund	World	01/99	Ecological and social responsive investments. Negative criteria: tobacco, arms, pornography, gambling, nuclear energy.
Focus GT Umwelttechnologie	Focus	World	12/90	Environment friendly technologies.
Fürst Fugger Sustainability Fund	Fugger	World	04/00	Index fund, Benchmark: Dow Jones Sustainability Group World index
KD Fonds Ökoinvest	KD	World	11/94	Environment friendly products or technologies.
Ökovision	Ökovi	World	05/98	Ecological and social criteria. Negative criteria: arms, nuclear energy, social/political/racial discrimination, animal experiments.
Oppenheim Topic DJ Sustainability World Index Equities	Oppen	World	02/00	Basis: investment universe of the Dow Jones Sustainability Group World index
Pictet Global Sector Water Fund	Pictet	World	04/00	Concentrates on the sectors "water" and "prevention of air pollution"
SAM Sustainability Index Fund	Sam1	World	04/00	Basis: investment universe of the Dow Jones Sustainability Group World index
SAM Sustainability Pioneer Fund	Sam2	World	04/00	Sustainability. Concentrates on small and mid caps
SEB Invest Ökolux	SEB	World	10/92	Ethical and ecological criteria. Negative criteria: arms, nuclear energy, bio-genetics, animal experiments, addictive drugs.
AXA World Funds II – Global Ethical Equities	AXA	World	01/97	Ecological and social criteria.
Sun Life Ecological Portfolio	Sun	World	10/91	Environment friendly products and technologies.
Swissca Green Invest	Swissca	World	12/98	Ecological and social criteria. Negative criteria: arms, tobacco, fossil fuels, nuclear energy, genetic technology, special chemicals, etc.
UBS Equity Fund Eco Performance	UBS	World	07/97	Ecological and social criteria. Negative criteria: arms, tobacco, nuclear energy, bio-genetics.
ValueSar Equity	SAR	World	07/99	Sustainability. Negative criteria: tobacco, arms, pornography, nuclear energy, automobiles, bio-genetics, special chemicals.

Notes:

¹ Start date in the Thomson Financial Datastream database.² Mid-2002.

Table 2: U.S. Equity Funds: Overview

Name	Abbrev.	Region	Start Date ¹	Portfolio Characteristics
Amana Growth Fund	Amana1	U.S.	08/95	Long-term capital growth consistent with Islamic principles. Negative criteria: alcohol, gambling, pornography, non-islamic banks, etc.
Amana Income Fund	Amana2	U.S.	07/93	Like Amana Growth fund, but 80% invested in income-producing equities.
American Trust Allegiance	Americ	U.S.	12/98	Socially responsible investments. Negative criteria: tobacco, alcohol, gambling, pharmaceutical industry.
Aquinas Growth Fund	Aquina1	U.S.	03/94	Follows Catholic investment guidelines. Negative criteria: arms, gender and race discrimination, abortion, contraception, pornography, tobacco, sweatshop labor, Northern Ireland, etc.
Aquinas Income Fund	Aquina2	U.S.	03/94	Like Aquinas Growth fund, but invests primarily in income-producing equities.
Ariel Growth Fund	Ariel1	U.S.	01/90	Positive criteria: Environment, diversity. Negative criteria: Tobacco, arms, nuclear energy. Invests in medium-sized companies (market cap. below \$1.5 bn.).
Ariel Appreciation Fund	Ariel2	U.S.	08/90	Like Ariel Growth fund, but invests in medium-sized companies with market cap. Between \$1 bn. and \$10 bn.
Calvert Capital Accumulation Fund	Calvert1	U.S.	11/95	Investment according to the social criteria of Calvert. No negative impact on the environment, positive labor relations, production of healthy and useful products. Negative criteria: nuclear energy, poor labor relations, strong environmental pollution, arms, tobacco, alcohol, gambling, etc.
Calvert New Vision Small Cap Fund	Calvert2	U.S.	02/98	Investment according to the social criteria of Calvert (see above).
Calvert World Value Inter-national Equity Fund A	Calvert3	World	11/92	Investment according to the social criteria of Calvert (see above). Investment in the U.S. < 5%
Citizens Emerging Growth Fund	Citizen1	U.S.	06/94	Negative criteria: alcohol, tobacco, arms, nuclear energy, gambling, unnecessary animal testing, no effective management of environmental resources, no promotion of diversity and equal opportunity. Invests primarily in medium-cap. companies.
Citizens Global Equity Fund	Citizen2	World	06/00	See above. Invests in companies of all size.
Citizens Index Institutional Fund	Citizen3	U.S.	08/97	See above. Invests primarily in large-cap. U.S. companies. New name: Citizens Core Growth Fund.
Domini Social Equity Fund	Domini	U.S.	11/93	The fund seeks to match the performance of the Domini 400 Social Index. Social and environmental criteria. Positive criteria: environment, diversity, community involvement, employee relations, etc. Negative criteria: alcohol, tobacco, arms, gambling, nuclear energy, etc.
Dreyfus Premier Third Century	Dreyfus	U.S.	01/90	Positive criteria: environment, product safety, employee safety, equal employment opportunity. Negative criteria: tobacco.
Green Century Equity Fund	Green	U.S.	10/97	Social and environmental criteria. Excludes companies with the worst records according to these criteria. Negative criteria: alcohol, tobacco, gambling, military weapons.
Meyers Pride Value/Citizens Value	Meyers	U.S.	10/98	Social criteria: open workplace policy, anti-discrimination, in addition to social and environmental criteria of Citizen (see Citizens Emerging Growth Fund).
MMA Praxis Growth Fund	MMA1	U.S.	03/94	Social criteria, Christian values. Medium and large cap companies.
MMA Praxis International	MMA2	World	07/97	Invests > 65 % in non-U.S. countries, up to 20% in emerging markets. Negative criteria: alcohol, tobacco, gambling, abortion products, pornography, nuclear energy, military contracting.

Name	Abbrev.	Region	Start Date ¹	Portfolio Characteristics
Neuberger&Berman Social Responsibility Fund	Neu	U.S.	05/96	Social criteria. Positive criteria: leadership in environment, diversity, workplace, community. Negative criteria: tobacco, gambling alcohol, weapons, nuclear energy.
New Alternatives Fund	New	U.S.	02/90	Socially responsible fund emphasising the environment and alternative energy. Negative criteria: weapons, animal testing, nuclear energy.
Parnassus Fund	Parnas1	U.S.	01/90	Contrarian investment strategy: favours undervalued stocks. Positive criteria: environment, equal employment opportunity, ethical business dealings, etc. Negative criteria: alcohol, tobacco, weapons, gambling, nuclear energy.
Paranassus Income Equity Fund	Parnas2	U.S.	05/93	Invests > 75 % in dividend paying equities. Same criteria as Parnassus fund.
Pax World Growth Fund	Pax	U.S.	02/98	Invests > 75 % in companies with market cap above \$200 mn. Favours industries like pollution control, health care, food housing, technology and education. Negative criteria: weapons, nuclear energy, gambling, alcohol, tobacco.
Rightime Social Awareness	Right	U.S.	07/90	Social criteria.
Security Social Awareness A	Secur1	U.S.	12/98	Social criteria: contribution to communities, employee relations, promoting women, minorities and the environment. Negative criteria: weapons, tobacco, alcohol, gambling, nuclear energy.
Security Social Awareness B	Secur2	U.S.	12/98	Same criteria as Security Social Awareness A fund.
Smith Barney Concert Social Awareness B	Smith	U.S.	11/98	Invests in companies with positive contribution to society.
Walden BBT International Social Index Fund	Wald1	World	10/99	Tracks MSCI/EAFE-index. Negative criteria: tobacco, alcohol, weapons, nuclear power, etc.
Walden Social Equity Fund	Wald2	U.S.	07/99	Same social criteria as Walden BBT International Social Index Fund.

Notes:

¹ Start date in the Thomson Financial Datastream database.² Mid-2002.

Table 3: Equity Indices: Overview

Name	Abbrev.	Company	Region	Start Date ¹	Characteristics
Calvin	Calv	Calvert	U.S.	06/00	Consist of large, U.S.-based socially responsible companies. Positive criteria: environment, workplace issues / employee relations, good community relations. Negative criteria: weapons, tobacco, alcohol, gambling, pornography. 637 companies in Sept. 2002. This number changes over time.
FTSE4Good Europe 50	FT1	Financial Times	EU	02/99 (07/2001)	Socially responsible investments. Criteria: environmental sustainability, positive relationships with stakeholders, universal human rights. Starting universe: FTSE Developed Europe.
FTSE4Good Global 100	FT2	Financial Times	World	08/96 (07/2001)	Same criteria as FTSE4Good Europe 50.
FTSE4Good US 100	FT3	Financial Times	U.S.	08/96 (07/2001)	Starting universe: FTSE Developed World. Same criteria as FTSE4Good Europe 50.
Naturaktien-index (NAI)	NAI	Öko-Invest-Verlag	World	05/97	Starting universe: FTSE Developed USA. Consists originally of 20 companies, now 25. Environmental, sustainability and social criteria. Negative criteria: weapons, discrimination of women, nuclear energy, tobacco, etc.
S&P 500 Environment Services	S&P	Standard&Poor's	U.S.	01/95	Special industrial sector index for environment services in the USA.
World – DS Environmental Control	DS	Thomson Financial Datastream	World	01/90	Special industrial sector index for environmental control. World-wide coverage.
DJSI World	DJSH1	Dow Jones	World	01/94 (09/1999)	Major criterion: Sustainability. Top 10 % of sustainable companies in each of the DJGI industry groups.
DJSI Stoxx	DJSI2	Dow Jones	EU	01/99 (10/2001)	Major criterion: Sustainability. Top 10 % of sustainable companies in each of the DJ STOXX 600 industry groups.
Domini 400 Social Index	DSI	KLD Research & Analytics	U.S.	05/90	Social and environmental criteria. E.g. employee relations, diversity, environment friendly products and production methods.

Notes:

¹Start date in the Thomson Financial Datastream database. Figures in brackets indicate the official launch date of the index. Those values of the index that are available in periods before the official start date have therefore been calculated backwards.

Table 4a: Mean return and Sharpe ratios: German and Swiss SRI funds

<i>Abbrev.</i>	<i>Period¹</i>	<i>Mean Fund²</i>	<i>Mean MSCI²</i>	<i>SR Fund³</i>	<i>SR MSCI³</i>
Activest	12/90	0.53	0.71	0.028	0.064
CS Fund	02/99	-0.77	-0.55	-0.204	-0.156
Focus	01/91	0.03	0.71	-0.074	0.063
Fugger	05/00	-1.28	-2.13	-0.438	-0.438
KD	12/94	0.066	0.62	-0.043	0.062
Ökovi	06/98	-0.27	-0.35	-0.117	-0.110
Oppen	03/00	-2.07	-1.78	-0.483	-0.377
Pictet	05/00	-0.82	-2.13	-0.276	-0.438
Sam1	05/00	-2.25	-2.13	-0.544	-0.438
Sam2	05/00	-3.11	-2.13	-0.425	-0.438
SEB	11/92	-0.11	0.75	-0.089	0.084
AXA	02/97	-0.23	0.30	-0.102	0.001
Sun	11/91	0.031	0.56	-0.065	0.035
Swissca	01/99	-0.47	-0.36	-0.150	-0.120
UBS	08/97	-0.09	-0.09	-0.070	-0.069
SAR	08/99	-0.73	-1.08	-0.201	-0.253

Notes:

¹ Period begins at the indicated date and ends Sept. 02.

² Mean log return of the fund and the MSCI World index, respectively.

Returns (% per month) are denominated in German mark until 12/98 and in euro from 01/1999 on.

³ Sharpe ratio (= SR) of the fund and the MSCI World index, respectively.

Sharpe ratios are calculated using the 1-month Fidor as risk-free interest rate.

Table 4b: Mean return and Sharpe ratios: U.S. SRI funds

<i>Abbrev.</i>	<i>Period¹</i>	<i>Mean Fund²</i>	<i>Mean MSCI²</i>	<i>SR Fund³</i>	<i>SR MSCI³</i>
Amana1	09/95	0.55	0.20	0.026	-0.049
Amana2	08/93	0.29	0.37	-0.042	-0.008
Americ	01/99	-0.64	-0.75	-0.169	-0.243
Aquina1	04/94	-0.58	0.31	-0.173	-0.026
Aquina2	04/94	-0.00	0.31	-0.083	-0.026
Ariel1	02/90	0.28	0.34	-0.033	-0.017
Ariel2	09/90	0.60	0.40	0.050	0.000
Calvert1	12/95	-0.26	0.18	-0.112	-0.053
Calvert2	03/98	-0.12	-0.47	-0.085	-0.178
Calvert3	12/92	-0.08	0.49	-0.131	0.025
Citizen1	07/94	0.02	0.33	-0.057	-0.021
Citizen2	07/00	-3.27	-2.17	-0.779	-0.522
Citizen3	09/97	-0.44	-0.22	-0.158	-0.129
Domini	12/93	0.54	0.39	0.034	-0.004
Dreyfus	02/90	0.05	0.34	-0.085	-0.017

<i>Abbrev.</i>	<i>Period¹</i>	<i>Mean Fund²</i>	<i>Mean MSCI²</i>	<i>SR Fund³</i>	<i>SR MSCI³</i>
Green	11/97	-0.28	-0.32	-0.148	-0.148
Meyers	11/98	-0.83	-0.59	-0.187	0.210
MMA1	04/94	0.09	0.31	-0.089	-0.026
MMA2	08/97	-0.65	-0.26	-0.221	-0.138
Neu	06/96	0.05	0.07	-0.088	-0.075
New	03/90	0.04	0.40	-0.082	-0.002
Parnas1	02/90	0.18	0.34	-0.038	-0.017
Parnas2	06/93	0.42	0.40	0.005	0.000
Pax	03/98	-0.49	-0.47	-0.177	-0.177
Right	08/90	-0.35	0.60	-0.178	0.041
Secur1	01/99	-0.84	-0.75	-0.294	-0.242
Secur2	01/99	-0.93	-0.75	-0.319	-0.243
Smith	12/98	-0.53	-0.73	-0.307	-0.242
Wald1	11/99	-1.29	-1.44	-0.425	-0.385
Wald2	08/99	-0.51	-1.23	-0.243	-0.344

Notes:

¹ Period begins at the indicated date and ends Sept. 02.

² Mean log return of the fund and the MSCI World index, respectively. Returns (% per month) are denominated in U.S. dollar.

³ Sharpe ratio (= SR) of the fund and the MSCI World index, respectively.

Sharpe ratios are calculated using the 1-month U.S. interbank offered rate as risk-free interest rate.

Table 4c: Mean return and Sharpe ratios: SRI Indices

<i>Abbrev.</i>	<i>Period¹</i>	<i>Mean Index²</i>	<i>Mean MSCI²</i>	<i>SR Index³</i>	<i>SR MSCI³</i>
Calv	07/00	-2.49	-2.17	-0.453	-0.522
FT1	03/99	-0.81	-0.88	-0.210	-0.275
FT2	09/96	0.60	0.10	0.036	-0.067
FT3	09/96	0.70	0.10	0.052	-0.067
NAI	06/97	0.22	-0.17	-0.028	-0.121
S&P	02/95	-0.32	0.34	-0.066	-0.019
DS	02/90	-0.04	0.34	-0.054	-0.017
DJSI1	02/94	0.42	0.35	0.002	-0.015
DJSI2	02/99	-1.04	-0.92	-0.266	-0.287
DSI	06/90	0.82	0.46	0.089	0.013

Notes:

¹ Period begins at the indicated date and ends Sept. 02.

² Mean log return of the fund and the MSCI World index, respectively. Returns (% per month) are denominated in U.S. dollar.

³ Sharpe ratio (= SR) of the fund and the MSCI World index, respectively.

Sharpe ratios are calculated using the 1-month U.S. interbank offered rate as risk-free interest rate.

Table 5a: Jensen's Alpha: German and Swiss SRI Funds

<i>Abbrev.</i>	<i>Start of Period</i> ¹	<i>Version</i> ¹	<i>Version</i> ²	<i>Version</i> ³
Activest	01/91	0.102	-0.016	-0.011
CS Fund	02/99	0.152	-0.351	-0.507
Focus	01/91	-0.317	-0.373	-0.400
Fugger	05/00	-1.333**	-1.786**	-1.697**
KD	12/94	-0.014	-0.057	-0.189
Ökovi	06/98	0.387	0.444	0.121
Oppen	03/00	-0.656	-0.873	-1.816**
Pictet	05/00	0.867	0.516	-0.442
Sam1	05/00	-0.743	-1.357***	-2.177***
Sam2	05/00	-0.611	-1.724	-2.373
SEB	11/92	-0.244	-0.191	-0.323
AXA	02/97	-0.070	0.283	0.127
Sun	11/91	-0.766	-0.919	-1.109*
Swissca	01/99	0.242	-0.050	-0.339
UBS	08/97	0.276	0.434	0.285
SAR	08/99	0.694	0.111	-0.619

Notes:

Significance levels: *** = 1%, ** = 5%, * = 10%, Newey-West corrected standard errors.

All calculations based on excess returns in German mark and euro (since 01/1999), respectively.

¹ End of period is Sept. 02.**Table 5b: Jensen's Alpha: U.S. SRI Funds**

<i>Abbrev.</i>	<i>Start of Period</i> ¹	<i>Version</i> ¹	<i>Version</i> ²	<i>Version</i> ³
Amana1	09/95	0.176	-0.241	-0.159
Amana2	08/93	-0.308*	-0.275	-0.219
Americ	01/99	-0.044	0.105	-0.249
Aquina1	04/94	-1.054*	-0.181	-0.137
Aquina2	04/94	-0.479	-0.143	-0.072
Ariel1	02/90	-0.482	-0.370	-0.313
Ariel2	09/90	-0.281	-0.195	-0.138
Calvert1	12/95	-0.647	-0.543	-0.455
Calvert2	03/98	-0.132	-0.121	-0.136
Calvert3	12/92	-0.286	-0.251	-0.312
Citizen1	07/94	-0.800	-0.989	-0.939
Citizen2	07/00	-2.055*	-1.953**	-2.647**
Citizen3	09/97	-0.624	-0.477	-0.387
Domini	12/93	-0.174	-0.073	-0.031
Dreyfus	02/90	-0.666**	-0.656**	-0.673***
Green	11/97	-0.515	-0.369	-0.329
Meyers	11/98	-1.325	-1.221	-0.930
MMA1	04/94	-0.581*	-0.545*	-0.506*
MMA2	08/97	-0.542	-0.360	-0.252
Neu	06/96	-0.584*	-0.428	-0.379
New	03/90	-0.448	-0.508	-0.518*
Parnas1	02/90	-0.883*	-1.054**	-1.061**
Parnas2	06/93	-0.115	-0.052	-0.022
Pax	03/98	-0.568	-0.305	-0.403
Right	08/90	-0.971***	-1.110***	-1.01***
Secur1	01/99	-0.464	-0.403	-0.375

<i>Abbrev.</i>	<i>Start of Period</i> ¹	<i>Version</i> ¹	<i>Version</i> ²	<i>Version</i> ³
Secur2	01/99	-0.560	-0.504	-0.471
Smith	12/98	-0.490**	-0.393	-0.367
<i>Wald1</i>	<i>11/99</i>	<i>-0.544</i>	<i>-0.798</i>	<i>-1.595**</i>
Wald2	08/99	-0.098	0.027	0.237

Notes:

Significance levels: *** = 1%, ** = 5%, * = 10%, Newey-West corrected standard errors.

All calculations are based on excess returns in U.S. dollar. Rows in italics indicate that the fund invests internationally.

¹ End of period is Sept. 02.

Table 5c: Jensen's Alpha: SRI Indices

<i>Abbrev.</i>	<i>Start of Period</i> ¹	<i>Version</i> ¹	<i>Version</i> ²
Calv	07/00	-1.922*	-1.876***
FT1	03/99	-1.258*	-1.047
FT2	09/96	0.318	0.246
FT3	09/96	0.212	0.211
NAI	06/97	0.363	0.353
S&P	02/95	-0.830	-0.839
DS	02/90	-0.427	-0.422
DJSI1	02/94	0.073	0.129
DJSI2	02/99	-0.271	0.002
DSI	06/90	0.276	0.224

Notes:

Significance levels: *** = 1%, ** = 5%, * = 10%, Newey-West corrected standard errors.

All calculations are based on excess returns in U.S. dollar.

¹ End of period is Sept. 02.

Table 6a: Impact of Blue Chips, Small Caps and Timing Capabilities: German and Swiss SRI Funds (= Model Version 3)

<i>Abbrev.</i>	<i>Blue Chip Index</i>	<i>BC Index Squared</i>	<i>Small Cap Index</i>	<i>SC Index Squared</i>	<i>R</i> ²
Activest	0.298***	-0.011**	0.379***	0.005	0.586
CS Fund	0.248**	-0.004	0.445***	-0.010*	0.589
Focus	0.299***	-0.014*	0.415***	0.002	0.416
Fugger	0.140	0.044***	0.348***	-0.017	0.298
KD	0.317***	-0.021***	0.459***	0.003	0.536
Ökovi	0.162**	-0.023***	0.327***	-0.0008	0.494
Oppen	0.430***	0.004	0.286***	-0.009	0.609
Pictet	0.009	0.261*	-0.024**	-0.011	0.475
Sam1	0.292**	0.006	0.402***	-0.006	0.645
Sam2	0.188	-0.014	0.677**	0.001	0.389
SEB	0.261***	-0.022***	0.465***	-0.0023	0.527
AXA	0.284***	-0.017**	0.336***	-0.008*	0.541
Sun	0.242***	0.009	0.553***	0.008	0.402
Swissca	0.395***	0.0006	0.339***	-0.013*	0.628
UBS	0.416***	-0.016***	0.378***	-0.002	0.692
SAR	0.359***	-0.018	0.328***	0.001	0.635

Notes:

Significance levels: *** = 1%, ** = 5%, * = 10%, Newey-West corrected standard errors.

All calculations are based on excess returns in German mark and euro (since 01/1999), respectively.

See also the notes of table 5a.

**Table 6b: Impact of Blue Chips, Small Caps and Timing Capabilities: U.S. SRI Funds
(= Model Version 3)**

<i>Abbrev.</i>	<i>Blue Chip Index</i>	<i>BC Index Squared</i>	<i>Small Cap Index</i>	<i>SC Index Squared</i>	<i>R²</i>
Amana1	0.575***	-0.007	0.361***	0.009***	0.574
Amana2	0.341***	0.006	0.118***	-0.003	0.481
Americ	0.662***	-0.002	0.300***	-0.008**	0.535
Aquina1	0.225*	0.014	0.313**	-0.036*	0.436
Aquina2	0.635***	-0.005	-0.077	-0.011*	0.324
Ariel1	0.517***	0.011	0.026	-0.006	0.296
Ariel2	0.511***	0.016*	0.065	-0.004	0.395
Calvert1	0.715***	-0.004	0.165*	-0.005	0.471
Calvert2	0.558***	0.009	0.311***	-0.002	0.441
<i>Calvert3</i>	<i>0.289***</i>	<i>-0.015</i>	<i>0.326***</i>	<i>-0.002</i>	<i>0.450</i>
Citizen1	0.761***	0.007	0.324***	0.0016	0.415
<i>Citizen2</i>	<i>0.396**</i>	<i>0.019</i>	<i>0.186</i>	<i>-0.029</i>	<i>0.364</i>
Citizen3	0.792***	0.008	0.133**	-0.004	0.676
Domini	0.683***	0.006	0.094**	-0.005*	0.746
Dreyfus	0.676***	0.000	0.159***	-0.001	0.604
Green	0.725***	0.010**	0.099*	-0.004	0.731
Meyers	0.762***	0.030***	0.254***	-0.005	0.452
MMA1	0.529***	0.005	0.109**	-0.003	0.568
<i>MMA2</i>	<i>0.267***</i>	<i>-0.014</i>	<i>0.387***</i>	<i>-0.000</i>	<i>0.417</i>
Neu	0.578***	0.009	0.095**	-0.005	0.630
New	0.364***	-0.009	0.334***	0.000	0.397
Parnas1	0.747***	0.010	0.317***	0.007	0.453
Parnas2	0.431***	0.000	0.034	-0.003	0.407
Pax	0.630***	0.011	0.217**	-0.007*	0.640
Right	0.524***	-0.009	-0.068	0.008	0.224
Secur1	0.610***	-0.003	0.126**	-0.003	0.642
Secur2	0.606***	-0.003	0.124**	-0.003	0.640
Smith	0.502***	0.003	0.083**	-0.003	0.752
<i>Wald1</i>	<i>0.228***</i>	<i>0.001</i>	<i>0.337***</i>	<i>-0.007</i>	<i>0.505</i>
Wald2	0.652***	0.015	0.087	-0.004	0.603

Notes:

Significance levels: *** = 1%, ** = 5%, * = 10%, Newey-West corrected standard errors.

All calculations are based on excess returns in U.S. dollar. Rows in italics indicate that the fund invests internationally.

See also the notes of table 5b.

**Table 6c: Impact of Blue Chips and Small Caps: SRI Indices
(= Model Version 2)**

<i>Abbrev.</i>	<i>Blue Chip Index</i>	<i>Small Cap Index</i>	<i>R²</i>
Calv	0.007	0.554***	0.467
FT1	-0.377***	0.827***	0.341
FT2	1.022***	-0.277***	0.606
FT3	0.917***	0.055	0.738
NAI	0.482***	0.330**	0.391
S&P	0.101	0.210	0.001
DS	0.437***	-0.088	0.030
DJSI1	0.425***	0.474***	0.549
DJSI2	1.447***	-0.631***	0.503
DSI	0.158*	0.292***	0.193

Notes:

Significance levels: *** = 1%, ** = 5%, * = 10%, Newey-West corrected standard errors.

All calculations are based on excess returns in U.S. dollar.

See also the notes of table 5c.

ENDNOTES

- [1] In the literature this market segment is named differently. In the United States the usual term is “socially responsible investing” which is also used throughout this study. In the UK the term most often used is “ethical investing” and in Germany the market segment is divided into several segments such as “environmental funds”, “environment-technology funds”, “sustainability funds” and “socially responsible funds”.
- [2] For a comprehensive literature survey see SCHÄFER and STEDEROTH (2002). The authors include almost all international studies that investigate the effects of SRI screening strategies on the performance of the investment.
- [3] The authors apply the approach of HENRIKSSON and MERTON (1981) which differentiates between upward and downward movements of the market index.
- [4] There are several funds in the sample which concentrate their investment only in their home-country. For such funds the MSCI World index is probably only a poor benchmark.
- [5] The funds are further divided into domestically and internationally investing funds.
- [6] See e.g. FAMA and FRENCH (1996).
- [7] KLD is the abbreviation of KLD Research & Analytics, Inc.
- [8] See e.g. LUTHER and MATATKO (1994), DiBARTOLOMEO and KURTZ (1999) and BAUER et al. (2002).
- [9] We do not use the so called Fama-French-factors as did BAUER et al. (2002) and GARZ et al. (2002). This is because the Fama-French-factors do not represent the primitive assets that constitute the SRI funds and indices but they represent instead a specific portfolio management strategy.
- [10] See e.g. ADMATI and ROSS (1985).
- [11] See TREYNOR and MAZUY (1966).
- [12] See NEWEY and WEST (1987).

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