

Ethical Management of the Government Pension Fund - Global:

An Updated Analysis

by

Thore Johnsen (NHH) and Ole Gjøølberg (UMB)

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Executive summary

In 2003, we prepared a large report concerning the ethical management of the Petroleum Fund, now the Government Pension Fund – Global (GPF) (Gjørlberg & Johnsen, 2003). The report contains a fairly thorough discussion of theories and methodology for the evaluation of fund management in general. In addition, we reviewed large parts of the empirical literature relating to so-called SRI investments (Socially Responsible Investments) available at the time. Finally, we carried out our own empirical analyses of key SRI funds and indices, as measured against conventional benchmarks based on return data from the period from about 1990 until about 2002.

In this report we are presenting, at the behest of the Ministry of Finance, an update of our 2003 report. We do not reiterate our theoretical and methodological discussion in relation to this type of research. In brief, the mandate from the Ministry of Finance is to update our findings from the 2003 study. In addition, the Ministry of Finance would like the update to emphasise *”the use of positive screening with relevance to funds such as the Government Pension Fund - Global”*.

We discuss, by way of introduction, some principal issues in relation to negative and positive selection. Following this, we review key contributions to the empirical literature since we published our 2003 study, primarily contributions based on data from the period since 2002. Finally, we present findings from our own statistical analyses of SRI performance for 2003-2007.

In discussing the basic differences between positive and negative screening, we argue that the latter principle is much clearer and more well-defined. Positive selection allows for a much more pronounced element of discretion. Furthermore, positive selection will tend to result in a significant reduction of the investment universe. Under a positive screening regime, one would have to focus the investments on larger companies than at present, given the GPF's guidelines that the ownership stake in any one company shall not exceed 10%. This will increase the risk associated with the Fund, as we indicate in

the subsequent empirical analysis. We also point out that positive screening may reduce the scope for being an active owner that seeks to influence the companies in which one invests in the desired ethical or environmental direction. Moreover, positive screening will imply that we leave the companies with scope for improvement to other owners – who may not necessarily be quite as active on ethical issues.

Our review of the recent empirical literature confirms, in large part, the findings from the literature from before 2003. There is relatively high variability in the performance of various SRI funds. Some funds perform better than their benchmarks and better than conventional funds, while the opposite is the case for others. Many studies conclude, at the same time, that SRI funds that narrow their investment universe with many positive and complex restrictions tend to underperform relative to funds that operate on the basis of simpler negative principles.

This is confirmed by our own empirical analyses of SRI investments, using data up and until 2007. These analyses show, by way of brief summary, that SRI funds and indices have through the period since 2003 achieved significantly lower risk-adjusted returns than have conventional benchmarks. This appears to be particularly so for the positively selected funds and indices. A likely explanation for this result is that positive screening induces an industry and company size bias in the portfolio composition that results in higher risk. For an extremely large fund like the GPF, this bias would be reinforced if one opted for reorienting the ethical management strategy from the current negative screening to positive selection. This is, *inter alia*, due to the 10% upper limit on the ownership stake held by the GPF in any one company. Such a restriction on ownership stakes, the continuation of which enjoys widespread political support, means that the GPF would have to focus its investments on larger companies and fewer markets than at present if it was to engage in more comprehensive positive screening.

Against this background, our recommendations are as follows:

1. The GPFG should retain its strategy of negative selection.
2. Positive selection strategies and so-called pioneering strategies, i.e. strategies that entail the prioritisation of investments in environmental technology, renewable energy, etc., must be motivated by other considerations than those involved in the management of a large pension fund. Consequently, such strategies should not be incorporated into the management of the GPFG. To the extent that the government wants to make such investments, they should be made through separate funds and/or institutions outside the GPFG and Norges Bank. This would make the outcome of such strategies much clearer than if the GPFG was to deviate from its current principles.

1. Ethical management: Some principles concerning selection criteria

1.1 Introduction

There is broad-based agreement that the Government Pension Fund - Global (referred to as the "GPF" or the "Fund") shall be managed in such a way as to maximise the return on the petroleum wealth, given an acceptable level of risk. This may be regarded as an ethical obligation towards future generations. The time horizon of the GPF is infinite. The wealth belongs not only to the current generation, but also to all future generations.

In addition to the GPF being managed in such a way as to generate the highest return over time (given the level of risk assumed), there is also broad-based agreement that management shall be effected within certain ethical constraints. These concern what businesses the GPF shall be permitted to invest in – or what businesses we do not, collectively, wish to hold ownership interests in. This may, depending on how these ethical restrictions are defined, have an effect on the return target. We will later on in this report discuss what empirical effects various ethical constraints have had on the risk-adjusted returns on a range of funds and indices that adopt ethical (and other) restrictions in their management (referred to as "SRI funds" or "SRI indices"). However, we will first discuss, at the level of general principles, possible effects of two different ethical management strategies: *Negative* and *positive* selection or screening. This concerns effects other than on returns (and risks) alone, namely on the potential ethical implications of the screening.

1.2. Negative versus positive selection

Thus far, the GPF has sought to meet its ethical objectives through so-called negative selection. This involves defining, to begin with, a broad international investment universe. One identifies, within this universe, a number of companies in which, based on various ethical considerations, one does *not wish* to invest. These may be companies that in their business activities violate human rights, make use of child labour, fail to observe ordinary standards for employee rights, manufacture nuclear weapons or cluster munitions, are responsible for severe environmental damage, etc. Such businesses may be

– and have been – excluded from the investment universe of the GPFG. This is negative selection that may be targeted at individual companies, or at industries or countries in which we do not wish to hold ownership interests. Funds that have adopted negative selection as a strategy have in practise often excluded specific industries (for example the production of tobacco, alcohol or weapons). Another type of negative selection has been so-called "norm-based" selection, which involves excluding investments in companies that violate international standards and conventions overlooked by organisations like the UN (the Universal Declaration of Human Rights), UNICEF (the Convention on the Rights of the Child) or the ILO (international employee standards). Consequently, negative selection usually entails the exclusion of specific countries, industries - or individual companies irrespective of country or industry – when one finds that these companies are engaged in business activities that we do not wish, based on ethical criteria, to participate (hold ownership interests) in.

It has recently been proposed, in the public debate, that ethical management of the GPFG should be reoriented from negative to *positive* selection. This implies, in simple terms, that one would, instead of excluding businesses operating in an industry or a country in which one does not wish to become involved as an investor, or that violate established international norms, choose to invest only in businesses that appear to be, in some sense, actively a force for good on ethical issues, the environment, peace, etc. In practise, these will be businesses that have a positive image, through their operations, their official policy declarations or their reputations and social involvement, when it comes to ethics, the environment, poverty alleviation, democracy, etc..

In its extreme or strict version, positive selection involves a significant narrowing of the investment universe. It is not sufficient to refrain from violating human rights or to observe international employee conditions to be accepted as a potential investment option, as the business needs to document something materially beyond that. In brief: It is not enough to prove that one does nothing wrong; one needs to prove that one does good too.

Certain funds invest on the basis of strict positive selection principles like these. However, in practise one is likely to often find more pragmatic attitudes also within funds that label themselves as being based on positive selection. It is, generally speaking, much more difficult to declare that a company is without a doubt ethically good than to define a company as being no doubt outside the realm of the ethically acceptable. The potential fallout from error¹ under a pure positive selection strategy may also be much higher than under a negative selection strategy. We therefore find, between the simple and relatively well-defined negative selection principle and the more complex and less well-defined positive one, a number of alternative strategies that contain elements of both positive and negative selection. A popular and pragmatic principle that has elements of positive selection is the best-in-class strategy. This entails selecting those companies that are perceived, based on various ethical or other criteria, to be best in their class. The class may be defined as an industry (energy, consumer goods, finance, etc.), but it is also possible to define classes as geographical regions. This means that the best-in-class strategy is relativistic: Company X may be included although there is agreement that its ethical performance is inferior to that of company Y, which operates in a different industry where it is the second or third best. In other words: A firm may be the best in a poor class, and a relatively good firm may be far from the top of the elite class.

Moreover, there has in recent years within so-called ethical management been introduced criteria that have not traditionally been associated with ethics in the original sense of the word. This pertains, in particular, to funds that invest in companies within environmental technology, renewable energy, etc. The literature often refers to these under the label of "pioneer screening". Companies that are at the forefront in terms of e.g. solar energy, are included in the investment universe, despite the relevant companies not necessarily having distinguished themselves as being at the forefront in terms of ethics. Such selection strategies are sometimes premised on the idea that companies which make a positive contribution, in various ways, in relation to the climate – or in relation to the fight against AIDS and malaria for that matter – are engaged in business activities that

¹ Probabilities of making incorrect decisions respecting negative versus positive selection can be compared to so-called Type 1 versus Type 2 errors in statistical hypothesis testing: The probability of rejecting the null hypothesis when it is correct or the probability of not rejecting the null hypothesis when it is incorrect.

involve, in themselves, positive ethical externalities.² This may obviously raise ethical conflicts or dilemmas. A pharmaceutical company that devotes large R&D resources to developing an anti-malarial drug that is cheap enough for even poor people to afford it may, at the same time, be conducting large-scale animal testing.

It has also been proposed in recent public debate that the management of the GPFG should to a larger extent be based on criteria relating to economic growth and poverty alleviation in developing countries. These are interesting views that raise entirely new ethical issues and challenges, in particular as far as positive selection is concerned. It is a regrettable fact that one very commonly finds a high correlation between, *inter alia*, corruption and poverty. Consequently, it may be very challenging to make investments in, for example, African countries if these are to be based on positive selection, even under a moderate version of the selection principle.³

1.3 The size of the GPFG and challenges related to negative versus positive selection.

An element of the ethical management mandate of the GPFG is that the Fund shall promote better ethics, environmental standards, working conditions, etc., in the companies in which the Fund is invested. This ought to have implications for the selection strategy on which the investments of the Fund are to be premised. The negative screening that has been pursued this far, entails that one may threaten to divest if the company fails to change its conduct in relation to, for example, working conditions or pollution. Negative selection allows for the possibility that there are "faults or defects" associated with a number of the companies in which one is invested. Positive selection,

² Our mandate from the Ministry of Finance is to update our SRI study from 2003. Our empirical work is therefore concentrated on traditional (broad-based) SRI funds. We have consequently not, at this juncture, specifically addressed effects from reorienting part of the GPFG's portfolio towards, for example, investments in renewable energy. It is absolutely practicable to perform such analyses, since there has over the last 10-15 years been established many listed companies within renewable energy and environmental technology, and also been introduced a range of indices addressing such businesses. However, this theme will have to be left for a follow-up analysis.

³ It would also be fully practicable to undertake interesting empirical analyses of returns and risks to study potential effects of the GPFG according more weight to companies in developing countries, based on data from the last decade. We keep to our mandate and must therefore, as with environmental investments, leave this for a later report.

on the other hand, will in its most radical version imply – at least in theory – that one only holds presumably "clean" companies in the portfolio. This means that one leaves investments in companies that fail to adhere to acceptable environmental standards, etc., to other investors. This raises the question of whether these "other" investors are as keen as the GPFG would have been to seek to improve standards? It is likely that in many instances such will not be the case. Consequently, negative selection may be said to be a selection principle that carries a risk of getting some "dirt on one's hands", although one can at least try to clean those hands. A strict positive selection may mean that one ends up with cleaner hands, while at the same time leaving others to take on what one does not want to touch.

We emphasise, again, that reality is of course not black and white, and that the above illustration pushes the difference between negative and positive selection to its extreme. However, there is, in principle, such a difference between the two perspectives when it comes to their potential for making a better world. When a fund opts for basing its ethical management on negative selection, it means that the fund acknowledges that there will almost always be scope for improvement when it comes to the environment, working conditions, etc. in several companies in its portfolio.

It is stipulated in the GPFG's mandate that the Fund shall hold no more than a 10%⁴ ownership stake in any one company. This is a political restriction.⁵ The GPFG is one of the largest government investment funds (Sovereign Wealth Funds, SWFs) in the world.⁶ Norway does not wish to be perceived as a modern imperialist that uses petroleum wealth as an instrument to take ownership and control of other countries' businesses. Neither is it in Norway's interest to take large positions that may create disturbances and volatility in both capital markets and entire national economies. In this respect, the GPFG differs

⁴ The limit used to be 5%. An increase to 10% does not materially impact on the line of argument we pursue here.

⁵ Some people would argue that there is also an ethical aspect to the concept of a state becoming a large owner in businesses in other countries.

⁶ It is likely, according to data from, *inter alia*, the IMF, that there were in 2007 only 2-3 SWFs of the same or a larger size: the Abu Dhabi Investment Authority (UAE), an unnamed Saudi Arabian fund, and possibly the Kuwait Investment Authority. However, there is considerable uncertainty associated with such rankings, since many of the large SWFs are much less transparent than is the GPFG.

from certain other government funds from, *inter alia*, the Middle East and Asia that appear to have less compunction about acquiring dominant positions in foreign companies. Some of these takeovers can be characterised as strategic investments in what are very important businesses for the countries in which such companies are domiciled.⁷

We choose to assume that there is broad agreement that Norway should keep to this strategy and refrain from challenging other countries by way of the Norwegian State acquiring, through the GPF, control of, for example, large banks, power suppliers, railway companies, etc., outside Norway. It would have been quite possible, given the current size of the GPF, to make such acquisitions.

This means that the 10% restriction can be perceived as an obstacle to realising the ambition of being at the forefront on ethical and environmental issues. Some will argue that there is, given such a modest ownership stake, not much one can achieve when it comes to influencing the company in a specific direction as far as ethics and the environment are concerned. One might argue, based on this line of reasoning, that the GPF should adopt a positive selection strategy: Since we are unlikely to be able to influence the companies in which we hold an ownership stake of less than 10%, we should concentrate on the companies that it is not all that important to influence. However, there are many indications that the GPF gets a hearing, even with an ownership stake below 10%, when the Fund's representatives voice – in shareholders' meetings, and to senior management in general – opinions in relation to ethics, the environment, etc. Such influence is reinforced by the fact that several other large institutional investors are also voicing similar opinions. There is every indication that when the GPF and funds with concurrent ambitions are active at the shareholders' meetings of companies (which the GPF certainly is), even moderate or small ownership stakes may push boundaries.

⁷ International organisations like the OECD, the IMF and the EU have over the last couple of years focused increasingly on issues relating to SWFs and their potential effect on capital markets in general and on economic conditions in the countries in which the SWFs are invested. A lot of information can be found at <http://www.imf.org/external/pubs/ft/survey/so/2008/POL03408A.htm>

Since the GPFG is a very large fund it is not all that easy to compare it to most other – typically much smaller - SRI funds. It is, *inter alia*, difficult for the GPFG to pursue the same strategies as these much smaller funds. The GPFG is dependent upon being able to invest and move very large amounts of money within a short period of time. This may be very hard in thin markets, especially if one wants to run an operation that does not destabilise or disturb price formation in the markets in which one operates. The fact that the GPFG is very large means, in combination with the requirement that the Fund shall not hold an ownership stake of more than 10% in any one company, that it would be difficult to accommodate any preference for reorienting management towards positive selection. For the positive selection to differ from the current negative screening in practise, it would be necessary to make the investment universe considerably narrower. This would force the GPFG to bias its weighing towards large-cap companies in large markets in order to absorb the money available for investment. This would mean, generally speaking, that one would have to reduce diversification and assume more unsystematic risk than at present. In addition, one may want to contemplate whether biasing the Fund towards larger markets and larger companies as a result of positive selection, may in itself have undesirable ethical and environmental implications.

This observation may be illustrated by looking at new figures presented by Eurosif (2006) for overall European SRI investments and the strategies that characterise these. The study distinguishes between "Core SRI" and "Broad SRI". The former are funds that primarily use either negative or positive screening. Negative screening is the type of strategy pursued by the GPFG thus far, i.e. the exclusion of specific companies on the basis of relatively simple and well-defined criteria. The study defines positive screening as searching for companies that are perceived, in various ways, as being exemplary in terms of ethics, e.g. best-in-class businesses. The study also includes so-called pioneer screening under the category of positive selection. This involves according priority to companies that are active within, for example, environmental technology, renewable energy, etc.

The study estimates the EU countries' overall Core SRI investments, excluding the GPF and the Swedish AP funds, at 105 billion Euros in 2005. In other words, aggregate European positively and negatively screened fund investments amount to about half of the investments of the GPF alone. About half of the European investments fall into each of the two categories of positive and negative screening. The portion of positively selected funds is made higher by the many rather small SRI funds found in all countries, apart from the Netherlands and England. The latter two are by far the largest SRI countries, holding a total of approximately 70 billion Euros. These two countries appear to be quite different in terms of strategy. The Dutch SRI funds are overwhelmingly based on negative selection, while the English funds are more equally distributed over the two main categories.

2. Risk-adjusted SRI returns until 2002

In 2003, we carried out a comprehensive analysis of the performance of investments in environmentally or ethically selected businesses or SRI funds through the 1990s and until 2002 (Gjølberg and Johnsen, 2003.) The analysis was based on a review of empirical literature available at the time, as well as our own empirical studies. We concluded, at the time, that some studies based on data from the 1990s found that SRI companies, funds and indices had performed as well or better than conventional funds and non-selected businesses. On the other hand, many analyses based on data from the 1980s and, in particular, the years around the turn of the millennium, concluded that SRI investments had delivered significantly weaker returns than had the conventional ones. This indicated that the performance of SRI investments relative to a conventional benchmark was not stable, but partly dependent on business cycles. While SRI funds appear to have delivered more or less the same – or even better – returns than conventional investments during a normal or expansionary phase, the findings from our study suggested that this was not the case in more difficult times. Consequently, the recession after 2000 was a very poor period for SRI investments. The SRI funds did considerably worse than conventional benchmarks during that period. The loss registered by the SRI funds during recessions was typically higher than the excess return occasionally achieved during the expansionary phase in the 1990s. One explanation for this may be that the SRI selection

had resulted in these funds featuring a relatively high proportion of businesses that encountered difficulties, or simply folded, when the markets turned, often young businesses in new industries. At the same time, the selection restrictions made it more difficult to divest these businesses when the market turned and the risk situation was radically changed. Several studies pointed, *inter alia*, to the fact that the globalisation effect (i.e. ever-increasing covariance between returns in different countries) was reduced when the economy went into recession. A number of empirical studies from the 1990s concluded that globalisation was causing growing covariance between countries, and that it was therefore less important than before whether one invested in one particular country or another one. Many believed that the most important variable was the composition in terms of sectors or industries. A number of studies after the turn of the millennium concluded that this cross-border covariance was not as pronounced any longer. Brooks & Del Negro (2003) found that the conclusions concerning ever-more integrated financial markets was a phenomenon of limited duration, associated with an international "bubble" through the 1990s (with the exception of integration within the EU), and that country-specific factors were now back as the key drivers. Consequently, the very biased country weighting in many SRI indices may have contributed considerably to the weak SRI performance since 2000.

We will later (Ch. 4) present the findings from our empirical analyses of return data for the years since 2003. We will in that context be examining whether the earlier conclusions continue to hold true, i.e. whether SRI funds continue to perform well during an expansionary phase like the one experienced over the period 2003-07. First, however, we will present findings from recent empirical literature.

3. SRI returns: Recent research findings

Socially Responsible Investments (SRI), Green Investments and Corporate Social Responsibility (CSR) have over the last 10-15 years become well-known terms within the financial media and amongst finance professionals. Much media coverage is concerned with returns and performance, as well as profiling and debate associated with, *inter alia*, asset management in relation to ethics, the environment and social responsibility for

firms and investors. The focus on this has generated a fair amount of empirical literature, including empirical analyses of the returns and risks associated with ethical, social or "green" ambitions and management restrictions. In Gjørberg and Johnsen (2003), we reviewed a fair share of the literature available at the time. In this section we will try to update the status by addressing a selection of recent international literature. The discussion does not purport to be exhaustive, but nevertheless covers a fairly comprehensive selection of recently published work within the area.

Margolis, et al. (2007) summarise the findings from 167 studies published over the last 35 years on the relationship between corporate social performance (CSP) and corporate financial performance (CFP). The study concludes that there is a weak positive correlation between the two. The authors find that the average correlation coefficient is 0.08-0.13. Apart from the fact that it is methodologically rather problematic to aggregate correlation coefficients and then calculate their average value, these correlations are very close to zero. This is in line with much of the research we referred to in our study from 2003: the conclusions in these analyses vary from "positive" to "negative" to "no" correlation. Besides, the authors point to the question of what comes first, "the chicken or the egg"? Is it so that good CSP (ethical awareness, contributions to poverty alleviation, etc.) results in favourable financial performance (CFP), or is the opposite the case; that good finances make it easier to show concern for the environment, poverty and ethics? Moreover, it is, as pointed out by, *inter alia*, McWilliams (2006), very difficult to undertake systematic quantitative analyses of such relationships, since there is no uniform and consistent definition of CSR. It is very difficult to measure CSR, and consequently very difficult to carry out empirical analyses of correlations between CSR and CFP.

Derwall, et al. (2005) examine the issue of whether so-called "eco-efficient" companies perform better or worse than do "non-eco-efficient" companies. Eco-efficiency is defined as causing low environmental emissions relative to turnover. The authors define two synthetic funds based on what are assumed to be the 30% most eco-efficient and the 30% least eco-efficient US companies (value-weighted) in the Innovate database. The return data are from the period July 1995 – December 2003. The study demonstrates no

significant difference in the Sharpe ratio between a market portfolio and the portfolio with the most eco-efficient companies. The Sharpe ratio of the portfolio with the least eco-efficient companies is somewhat lower than those of the two others. There is no difference between the portfolios when measured by Jensen's alpha (none of them have an alpha that is significantly different from zero, and the two synthetic portfolios have almost identical betas and the same unsystematic risk). However, when adjusted for size, book-to-market and a winner-loser-factor in a Fama-French factor model, the authors find a significant positive alpha for the eco-efficient portfolio. Consequently, the study is in line with other studies concluding that there were, generally speaking, no significant excess returns on selected funds over this period, although one finds in certain cases an excess return when adjusting for size (here: small-cap effect). Nor are the findings of the authors noticeably different from our findings for this period, as presented in Ch. 4 below.

Scholtens (2007) analyses data for seven Dutch SRI funds since 2001. His conclusion is, *inter alia*, that there are large differences between these SRI funds in terms of financial performance. He concludes that all seven funds have generated a risk-adjusted return that is *inferior* to that on a conventional benchmark (MSCI World). The SRI funds appear, on the whole, to have assumed more risk. Scholtens seeks to explain this by examining the composition of the SRI funds. He finds that the negative excess return on several of the Dutch SRI funds can partly be attributed to a size effect in the sense that the portfolios are biased in favour of large-cap companies.

Renneboog, et al. (2006) analyse SRI funds from 17 countries over the period 1992-2003. They conclude that SRI investors appear to be less concerned with return and risk than is commonly the case among investors. They furthermore argue that SRI funds display a tendency to chase past returns, i.e. that the investors pick equities that have performed well in the past. They believe that the consequence of this is that these funds tend to show inferior performance. In a parallel study, Renneboog, et al. (2007), the same authors analyse financial performance over the period 1991-2003 for 463 SRI funds. These are compared to 716 non-SRI funds. Consequently, the period includes the years when there

was strong growth in the stock market, as well as the recession after the turn of the millennium. The study concludes that many European and Asian SRI funds have delivered performance that is significantly inferior to that of their benchmarks, in the region of 5 % per year. On the other hand, it is concluded that English and US SRI funds do not perform significantly worse than their benchmarks. It is further concluded that funds with broad selection criteria perform significantly better than do funds that make their selections on the basis of restrictive factors like, for example, environmental factors only. In other words: Imposing restrictions on the ethical selection beyond broad characteristics reduces returns. This is hardly surprising, since the population of potential companies can easily become drastically reduced when one combines two or more positive selection requirements.

Statman (2007) follows up on his earlier studies (Statman, 2000; Hamilton, Jo and Statman, 1993), and argues that SRI funds do not, generally speaking, tend to generate significantly lower risk-adjusted returns than do conventional funds. He emphasises, at the same time, that investors in such funds must be prepared for deviations from their benchmarks on a periodical basis, and that advisors have to make the investors aware of this. The conclusion is in many ways the same as in our 2003 study: SRI funds can at times match the performance of, or even outperform, conventional funds. SRI investors should, at the same time, be prepared for periods of underperformance. This may entail a political and reputational risk as far as the GPFG is concerned. The GPFG operates under a very long time horizon. The media, the general public and politicians appear, at the same time, to be most concerned with developments in the short run. It may therefore be burdensome for the managers to experience periods of very poor performance – particularly if such performance is caused by a specific profiling of the GPFG.

Bello (2005) analyses 42 SRI funds and 84 conventional funds over the period 1994-2001. He finds that the characteristics of these SRI funds in terms of the portion of large-cap companies, diversification, the portion of equities vs. bonds, etc., do not deviate from the corresponding characteristics of conventional funds. The SRI funds Bello has studied have over this period not generated average returns that differ significantly from those on

the conventional funds. However, they carry significantly higher risk, as measured by the standard deviation of returns. Both fund categories have underperformed relative to their respective benchmarks (DSI 400 and S&P 500) over the relevant period, which is explained by both being under-diversified.

Schröder (2007) analyses 29 SRI indices. He finds that these indices did not have returns that differed significantly from conventional indices through the 1990s and until the end of 2003, while the risk associated with the SRI indices generally appears to be higher. Corresponding conclusions are drawn by Bauer, et al. (2005) in a study of 103 German, English and US SRI funds over the period 1990-2001 and a corresponding study of 8 Canadian SRI funds and 276 ordinary funds over the period 1994-2003 (Bauer et al, 2007): No significant difference in risk-adjusted returns when compared to conventional funds. The same conclusion is reached by Gregory and Whittaker (2007) in a study of 32 English SRI funds and 160 ordinary funds.

A new Master's dissertation from the Stockholm School of Economics (Stenström and Thorell, 2007) examines 23 Swedish SRI funds⁸ and 42 ordinary funds over the period 2001-2007. Most of these funds pursue a negative selection strategy, but well over half of them supplement the criterion with one or more positive criteria like, *inter alia*, environmental profile, best-in-class, social reputation, etc. The study concludes that the SRI funds have over this period underperformed relative to the conventional ones. It is asked, in this context, whether this is caused by the qualities of the managers, i.e. whether the weaker SRI performance is simply caused by the SRI managers being not as good as the conventional ones. One seeks to test this by eliminating (on the basis of negative selection) a total of 100 companies from the portfolios of the conventional funds.⁹ It then turns out that the conventional funds would have performed even better if the managers had carried out negative selection. The authors conclude that the conventional funds

⁸ All these SRI funds are very much smaller than the GPF. The authors indicate that funds under SRI management in Sweden around 2006 amounted to approximately USD 20 billion.

⁹ The authors acknowledge that it would be virtually impossible to carry out scientifically-based positive selection from the conventional funds. They therefore opt for simple negative selection and exclude companies from the conventional funds. They have established the list of excluded companies (totalling 100) by adding together all companies excluded by the Seventh AP Fund (AP7), the GPF and Ethix SRI.

outperform the SRI funds because they have better managers, and that the conventional funds would have performed *even a bit better* if they had used negative ethical selection. This is rather interesting, since the negative selection simulated by the authors is partly based on the GPF's criteria. The conclusion that conventional managers are better than the SRI managers seems questionable. A more obvious explanation (not discussed by the authors) would be that inferior SRI performance is caused by the partly vague positive selection criteria applied by the various SRI funds in the sample. An alternative interpretation would be that pure negative selection would have resulted in better performance on the part of the SRI funds, irrespective of the managers.

Besides the Swedish Master's dissertation from 2007, there are not many published empirical studies based on data from the period 2002/03-07. This period has been characterised by strong international growth, without major lasting setbacks. At the same time, this period has not involved extreme growth within specific industries like we experienced during, for example, the "dot-com period" around the turn of the millennium. An updating of the analyses for this period could therefore provide us with information on how the SRI investments perform during what one may label a more "normal" expansionary phase. We will in the next section present such an update, looking at the last decade as a whole, while also decomposing the data into three sub-periods: 1997-2000, 2000-2003 and 2003-2007.

4. An updated empirical analysis of experience from 2003-2007

4.1 Overview

We have looked at return data for the US SRI index Domini 400 (DS400) and various regional ethical indices established by Dow Jones (DJ) and FTSE (Financial Times Stock Exchange). The underlying portfolios combine, to various extents, both positive and negative company selection. Our earlier analysis (Gjølborg and Johnsen, 2003) for the period 1997-2002 is expanded with data for a further five years, for the period 2003-2007. The previous period was characterised by two extreme sub-periods, i.e. the "dot-com bubble" until March 2000 and the subsequent prolonged stock market decline until

March 2003. The period from April 2003 can, on the other hand, be characterised as an expansionary phase in terms of stock market return and risk.

Our earlier analysis focused on the DS400 (including the SRI fund Domini Social Equity, which was indexed to the DS400), as well as DJ's European STOXX Sustainability Index (DJSI STOXX). Returns and risks were measured relative to benchmark indices chosen by the index providers, viz. the US S&P 500 for the DS400 and the European DJ STOXX 600 for the DJSI STOXX. These benchmark indices comprise the 500 largest US and 600 largest European listed companies, respectively. The analysis showed parallel developments in the excess returns for the two SRI portfolios relative to the benchmark indices. While the dot-com period generated considerable positive SRI excess return, this was almost eliminated by a significant negative excess return during the subsequent stock market decline. Consequently, for the period 1997 – 2002 as a whole, there was only a marginal difference in average returns between the SRI portfolios and the benchmark indices. On the other hand, the SRI portfolios were characterised by significantly higher volatility of returns, both for the period as a whole and, in particular, for the period of stock market decline after March 2000.

Therefore, we concluded that although positive selection would not necessarily change the average returns over time, the volatility of returns might be considerably higher. We will see below that the expanded data sample for the entire period 1997 – 2007 confirms the latter part of the conclusion; that the SRI portfolios generally have a higher volatility of returns than have their benchmark portfolios. On the other hand, the new findings are more negative as far as average returns on the SRI portfolios are concerned, since the portfolios have generated significantly lower average returns than their benchmark portfolios over the last sub-period, 2003 - 2007.

Table 1 SRI indices and benchmark indices

SRI-index	Benchmark (BM)	# companies			Selection		Start	Data
		SRI	BM	SRI %	Negative	Positive		
Domini 400 Index								
- USA	S&P 500 ¹	400	500		AGTAF/N ²	Yes	1990	May 90
FTSE4Good Index (FTSE4G)								
- USA	FTSE AW Dev US	145	688	21 %	TA/N ³	Yes	2001	Jan 97
- Europe	FTSE AW Dev Europe	290	521	56 %	"	Yes	2001	Jan 97
- UK	FTSE All-Share	273	674	41 %	"	Yes	2001	Jan 97
- Global	FTSE AW Dev	691	2000	35 %	"	Yes	2001	Jan 97
DJ STOXX Sustainability Index (DJSI STOXX)								
- Europe	DJ STOXX 600	154	600	26 %	Nei	Yes	1999	Jan 99
ex AGTAF / AGTAFA (DJSI ex AGTAF / AGTAFA)								
- Europe	DJ STOXX 600	138	600	23 %	AGTAF ²	Yes	1999	Jan 99
- Europe	DJ STOXX 600	132	600	22 %	AGTAFA ⁴	Yes	2001	Nov 01

¹ 250 companies from S&P 500, 100 additional companies for diversification, and 50 companies with particularly high ethical standards. Should therefore be compared with a broader benchmark than S&P 500.

² AGTAF / N = "Alcohol, Gambling, Tobacco, Armaments, Firearms" / "Nuclear powerplants"

³ TA / N = "Tobacco, Armaments" / "Nuclear powerplants"

⁴ AGTAFA = AGTAF + "Adult entertainment"

Table 1 describes key characteristics of the ethical US index Domini 400 (DS400) and of the various ethical regional indices that have been developed by the companies FTSE and DJ.

The DS400 is the oldest and probably best known of the ethical indices. It is used as the foundation for the composition of a number of US ethical equity funds, of which Domini Social Equity Fund (DSEF) is the best known. The DSEF was passively indexed relative to the DS400 until 30 November 2006, but is now actively managed relative to this index. The DS400 has been developed and maintained by the US investment research firm KLD since 1990. The index comprises 400 companies, and combines negative and positive company selection. Approximately 250 companies have been selected from S&P 500. In addition, approximately 100 generally smaller companies have been included to achieve diversification and depth, and a further 50 small-cap companies have been included because of exemplary ethical credentials. The DS400 excludes companies involved in production/sales within so-called AGTAF businesses, i.e. Alcohol, Gambling, Tobacco, Armaments, Firearms, as well as companies that own or operate nuclear power plants.

The positive selection is said to be based on the following set of criteria: "*We seek to invest in companies that cultivate the skills and talents of their employees, that earn the trust and respect of their customers, suppliers, and investors, that strengthen their local communities, and that enhance the ecosystems upon which we all depend for survival.*" These are vague criteria, and we will below illustrate how this company selection seems to work in practice.

The UK index provider FTSE introduced SRI indices under the designation FTSE4GOOD (FTSE4G) in 2001, and has constructed comparable return series going back to January 1997. The indices cover various countries/regions, and are based on the ethical selection of companies from FTSE indices for the same regions. For the US, Europe (incl. the UK), Japan and the world, these use a company selection from the correspondingly broad FTSE All-World Developed indices (FTSE AW Dev), which have also been benchmark indices for the Petroleum Fund (the GPF). The British FTSE4GOOD UK is, on the other hand, based on the more comprehensive All-Share index for the London Stock Exchange. Table 1 shows that the ethical selections normally represent only 20% - 40% of the overall number of companies in the benchmark indices. The FTSE4G combines positive and negative selection. The indices thus exclude tobacco producers, companies that manufacture important parts for nuclear weapons or whole weapon systems, as well as companies that own or operate nuclear power plants. The positive selection takes place in cooperation with EIRIS (Ethical Investment Research Service), and represents a more comprehensive and formalised version of Domini's selection system. We will below examine characteristics of the company selections of these SRI indices.

The US media and analysis firm Dow Jones introduced its European STOXX Sustainability Index (DJSI STOXX) already in 1999, based on positive selection from the STOXX 600 (the 600 largest European listed companies). DJ also provides two negatively selected varieties of this index, i.e. the DJSI STOXX ex AGTAF and ex AGTAF (AGTAF = AGTAF + Adult entertainment). Furthermore, DJ provides a positively selected index, DJSI EURO STOXX, limited to companies within the Euro

Zone. The positive selection for all the indices is done in cooperation with SAM (Sustainable Asset Management), a leading Swiss advisory firm within ethical asset management.

4.2 US SRI indices: Domini 400 and FTSE4Good US

Table 2 and 3 show returns and risks for the SRI indices Domini 400 (DS400) and FTSE4G US (F4G US), and for the corresponding benchmark indices S&P 500 and FTSE US, for the entire period January 1997 - December 2007, and for each of the three sub-periods Jan 97 – Mar 00 (the dot-com bubble), Apr 00 – Mar 03 (the stock market decline) and Apr 03 – Dec 07 (the expansionary phase). In short, the figures show that for the entire period 1997-2007 as a whole, the DS400 has produced a positive excess return of 0.24% p.a. when compared to the S&P 500, while the F4G US has had a negative excess return of 0.76% p.a. relative to the more comprehensive benchmark index FTSE US¹⁰

Table 2 Domini 400 versus S&P 500, Jan 97 - Dec 07

Portfolio	jan 97 - dec 07		jan 97 - mar 00		apr 00 - mar 03		apr 03 - dec 07	
	Avg	Std dev						
Domini 400	9.59	15.74	32.93	18.31	-16.03	17.88	13.29	9.10
S&P 500	9.35	14.84	27.91	17.05	-14.79	17.35	14.72	8.51
DS400 - S&P	0.24	2.94	5.02	2.97	-1.24	3.63	-1.43	2.12

* Average return is annualized by $(1+R_m)^{12} - 1$, where R_m is the arithmetic monthly average.

Standard deviation is annualized by $Std_m \times \sqrt{12}$.

¹⁰ The index provider KLD emphasises the S&P 500 as a benchmark index for the DS400, although the company selection is much broader. If we had instead used a more comprehensive benchmark index, e.g. the FTSE US (668 companies) or the Wilshire 1000 (1,000 companies), the DS400 would also have registered a negative excess return for the entire period 1997 – 2007.

Table 3 FTSE4G US versus FTSE US, Jan 97 - Dec 07

% annualized arithmetic average and standard deviation for monthly (differential) return*

Portfolio	jan 97 - dec 07		jan 97 - mar 00		apr 00 - mar 03		apr 03 - dec 07	
	Avg	Std dev						
4G US	8.79	16.83	33.62	19.31	-18.15	19.79	12.74	9.25
FTSE US	9.55	14.93	28.51	17.10	-15.14	17.51	15.12	8.44
4G US - FTSE US	-0.76	3.80	5.11	4.27	-3.01	4.51	-2.38	2.51

* Average return is annualized by $(1+R_m)^{12} - 1$, where R_m is the arithmetic monthly average.

Standard deviation is annualized by $Std_m \times \sqrt{12}$.

The differences in returns are illustrated in Charts 1 and 2, which show monthly developments in the value of each of the SRI indices and their respective benchmark indices, and Chart 3 shows the cumulative excess returns on the SRI indices relative to their benchmark indices.

Chart 1 Domini 400 versus S&P 500, Jan 1997 - Dec 2007

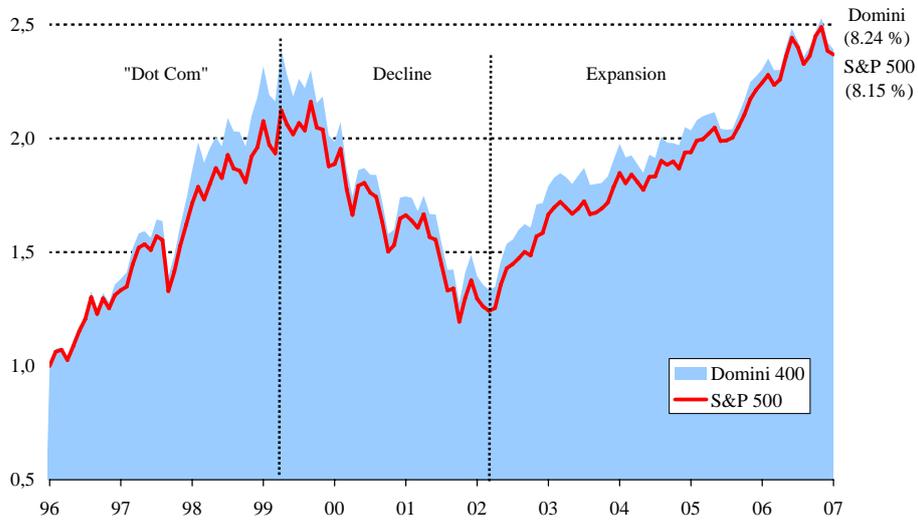


Chart 2 FTSE4G US versus FTSE AW US, Jan 1997 - Dec 2007

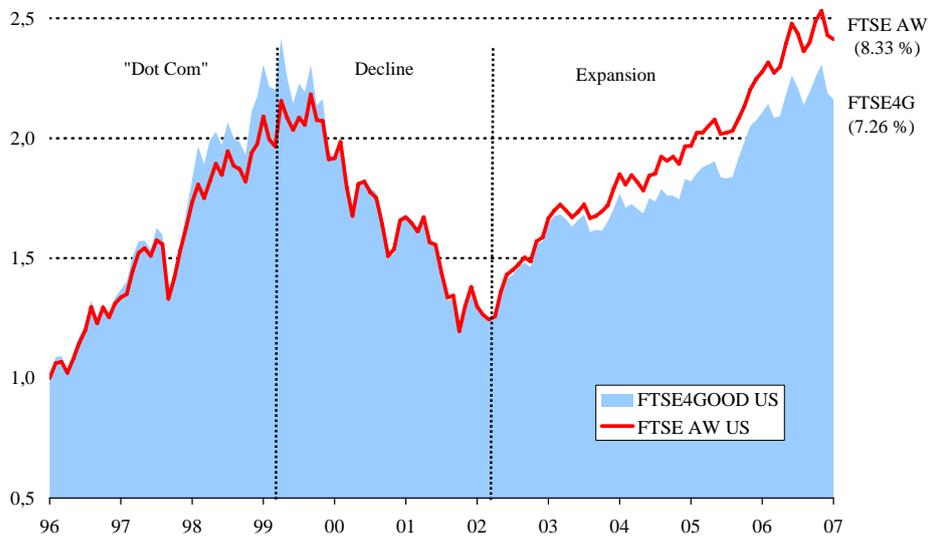
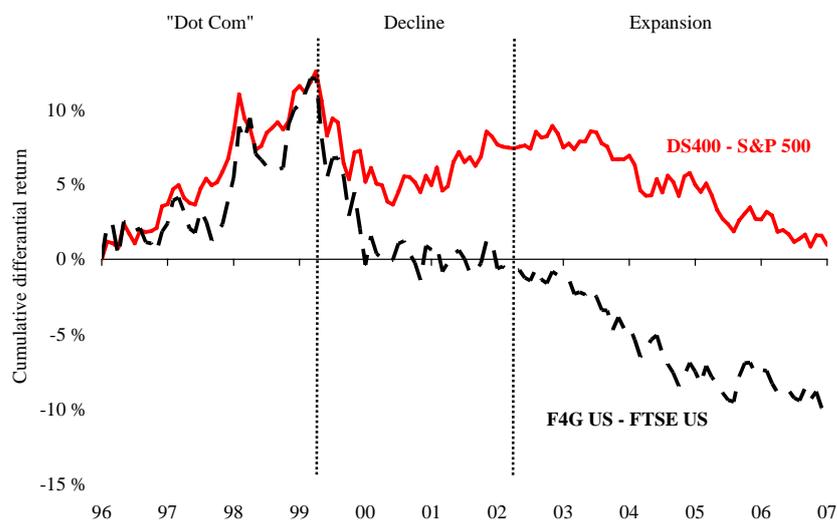


Chart 3 Cumulative differential returns on the DS400 and the FTSE4G US

Relative to S&P 500 and FTSE US, Jan 97 - Dec 07 ($\text{Value}_{\text{SRI}}/\text{Value}_{\text{BM}} - 1$)



Charts 1-3 and the return data in Tables 2-3 for the first two sub-periods confirm the findings from Gjølberg & Johnsen (2003). The SRI portfolios outperformed their benchmark indices with a good return margin during the dot-com bubble, but were thereafter soundly beaten during the subsequent stock market decline until March 2003. The Charts show that the DS400 outperforms its benchmark index over the entire period January 1997 - March 2003 as a whole, while the F4G US underperforms relative to its benchmark index. The Tables indicate, on the other hand, that both SRI indices were winners for the entire period as a whole, since the positive excess return over the first sub-period (which is also the longest one) is considerably higher than the negative excess return over the second sub-period, also for the F4G US in Table 3. This illustrates the difference between the arithmetic return data used in the Tables (simple averages) and the geometric returns in the Charts (average growth). As discussed in Gjølberg & Johnsen (2003), geometric average returns are always lower than arithmetic average returns.¹¹

¹¹ The difference between geometric and arithmetic average returns can be explained by a simple compounding effect. In our case the geometric average for the period January 1997 – March 2003 is

Geometric returns are the most relevant ones for our purpose, which is to describe historical returns and examine a portfolio's future shortfall risk in relation to any expected withdrawals of gains, i.e. the probability that the growth in value will not be sufficient to cover the withdrawals, cf. the fiscal rule for the GPFG.

The last, and more normal, stock market period, April 2003 – December 2007, continued with further losses for both SRI portfolios, relative to their benchmark indices. For the period 1997 – 2007 as a whole, Tables 2 and 3 show a positive annual (arithmetic) excess return of 0.24% for the DS400, but a negative excess return of 0.76% for the F4G US. The more relevant geometric return differences in Charts 1 and 2 reduce the positive excess return on the DS400 to only 0.09%, and increase the negative excess return on the F4G US to -1.07%.

An average negative annual excess return of approximately 1% over an 11-year period for the F4G US, relative to its benchmark index is very high, especially since the volatility of returns is, at the same time, considerably higher than for the benchmark index. Hence, the tables show that the volatility of returns on both the SRI portfolios has been significantly higher than for the benchmark indices, both for the period as a whole and for each sub-period. This resulted in a tracking error (standard deviation of periodical return differentials) of as much as 3.80% p.a. for the FTSE4G US over whole period 1997 – 2007, and 2.94% p.a. for the DS400.

4.3 Other regional SRI indices

The upper part of Table 4 expands the above analysis to all regional FTSE4G indices for the whole period 1997 -2007 (first column) and for the three sub-periods. The lower part of the table shows corresponding figures for the European DJSI indices, but here only for the shorter 9-year period January 1999 – December 2007, for which data are available.

reduced (relative to the arithmetic average) because percentages lost during the stock market decline from April 2000 onwards also reduce the large gains from the dot-com period (this gain is "realised" in the calculation of the arithmetic average).

We have also included figures for the FTSE4G Europe as far as this shorter time period is concerned, to facilitate comparison.

The figures for average returns and risks in the table are remarkably similar across the SRI indices and across the various time periods. The similarity is confirmed by the cumulative excess returns in Chart 4 and 5. All the SRI portfolios underperformed relative to their benchmark indices over the last sub-period, April 2003 – December 2007, as they also did over the preceding three years, April 2000 – March 2003 (with a marginal exception for the European DJSI Stoxx). The average annual loss over the last sub-period, 2003-07, is in the range of 1.50% - 2.00%, and the standard deviation of the excess return (tracking error) is 1% - 2% throughout. This suggests a representative information ratio (IR) of approximately -1.0, which is very low and statistically significant (on at least the 5% level). Most SRI indices also underperformed relative to their respective benchmark indices when looking at the entire period 1997 – 2007, with the exception of the Domini 400 as discussed above, as well as the FTSE4G Global as discussed below.

Table 4 SRI funds and indices versus their benchmark indices for sub-periods

% annualized monthly arithmetic averages and standard deviations*

Index	Benchmark		jan 97 - dec 07			jan 97 - mar 00		apr 00 - mar 03		apr 03 - dec 07	
			Avg	Stdev	IR	Avg	Stdev	Avg	Stdev	Avg	Stdev
<u>Jan 97 - Dec 07</u>											
Domini 400	S&P 500	USD	0.24	2.94	0.08	5.02	2.97	-1.24	3.63	-1.43	2.12
FTSE4G US	FTSE AW US	USD	-0.76	3.80	-0.20	5.11	4.27	-3.01	4.51	-2.38	2.51
FTSE4G Europe	FTSE AW Europe	Euro	-0.59	2.32	-0.26	3.46	3.17	-2.01	2.41	-1.73	1.04
FTSE4G UK	All-Share	GBP	-0.85	2.91	-0.29	1.07	4.67	-0.67	2.25	-2.27	1.10
FTSE4G Global	FTSE AW Dev	USD	0.54	2.93	0.19	6.94	3.58	-2.17	3.28	-1.26	1.46
<u>Jan 99 - Dec 07</u>											
FTSE4G Europe	FTSE AW Europe	Euro	-1.27	2.04	-0.62	2.35	3.24	-2.45	2.41	-1.46	1.04
DJSI STOXX	STOXX 600	Euro	-0.39	2.31	-0.17	1.91	3.97	0.15	2.47	-1.42	1.39
ex AGTAF	STOXX 600	Euro	-0.70	2.49	-0.28	0.96	4.11	-0.01	2.75	-1.70	1.54

* Average return is annualized by $(1+R_m)^{12} - 1$, where R_m is the arithmetic monthly average.

Standard deviation is annualized by $Std_m \times \sqrt{12}$.

Chart 4 Cumulative differential returns, FTSE4G indices relative to benchmark

Jan 97 – Dec 07

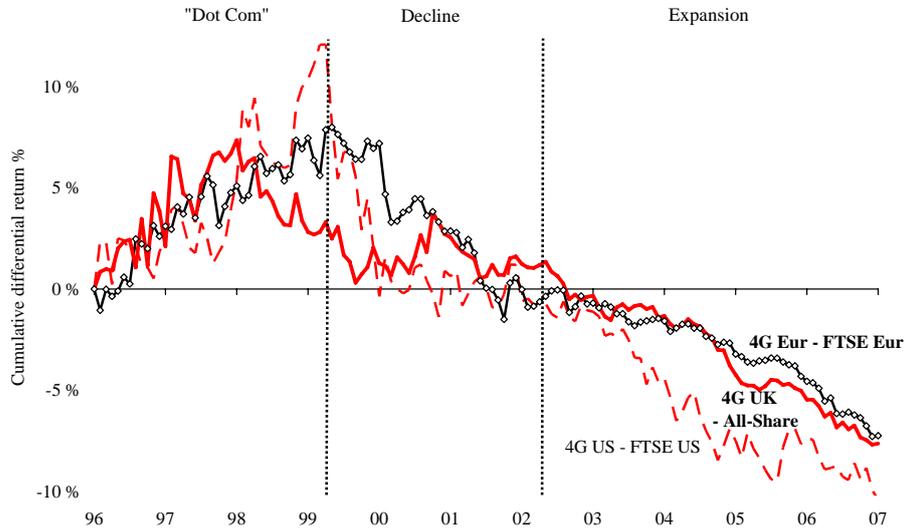
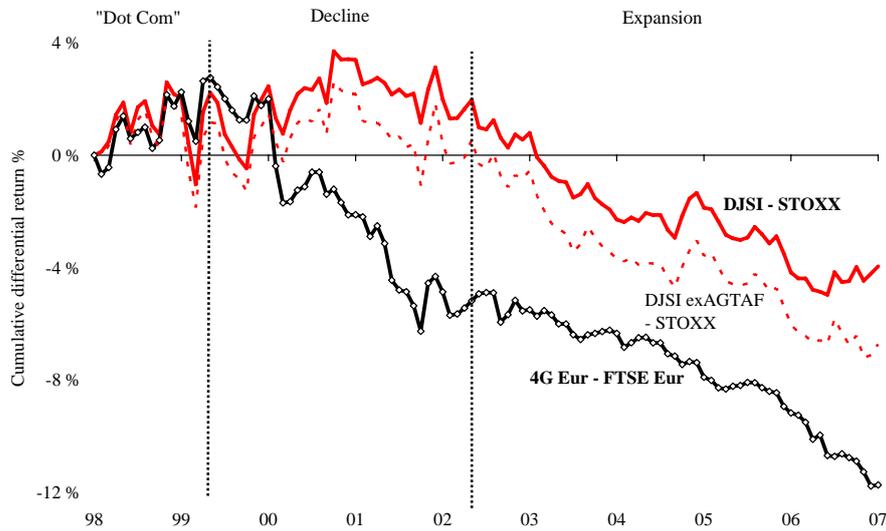


Chart 5 Cumulative differential returns, European SRI indices

Jan 99 – Dec 07



What causes these considerable return biases in the SRI indices, when compared to the more representative benchmark indices? One explanation lies in the fact that these indices' element of positive selection will, generally speaking, result in a steep reduction in the investment universe, cf. Table 1 above. This is in the nature of positive selection, cf. our introductory comments hereon in Section 1.2. Making a negative selection means excluding companies that one does not wish to hold ownership interests in. Positive selection is much more demanding, and will normally imply that the threshold becomes much higher. The investment universe shrinks rapidly when negative selection is supplemented with positive selection, and the more positive requirements are introduced, the smaller becomes the opportunity set available to the manager.

Nevertheless, the likely most important explanation for the return discrepancy is the apparently systematic bias ("tilting") of the SRI indices in relation to, *e.g.* industry, company size and countries/regions. This tilting is illustrated in Charts 6 - 8 for the global FTSE4G index, relative to its FTSE AW Global benchmark, but is also representative for the other SRI indices. In brief, the SRI indices are tilted in favour of large-cap companies (Chart 6) and industries with considerable growth potential (Chart 7 shows a tilting away from traditional industries – including oil and gas production and utilities – and towards, *e.g.* telecoms and technology companies). This explains the pronounced discrepancy in return developments during the dot-com period, when large-cap growth companies were priced particularly high, and the opposite discrepancy during the subsequent stock market decline, when the prices of such companies went into steep decline. There is also reason to believe that the sustained SRI loss during the last stock market period, April 2003 – December 2007, can be explained by *e.g.* the large-cap tilting of the SRI indices, since small-cap companies and companies within more traditional industries have performed particularly well over this period.

Chart 6 Company size for F4G Global versus FTSE Global yearend 2007

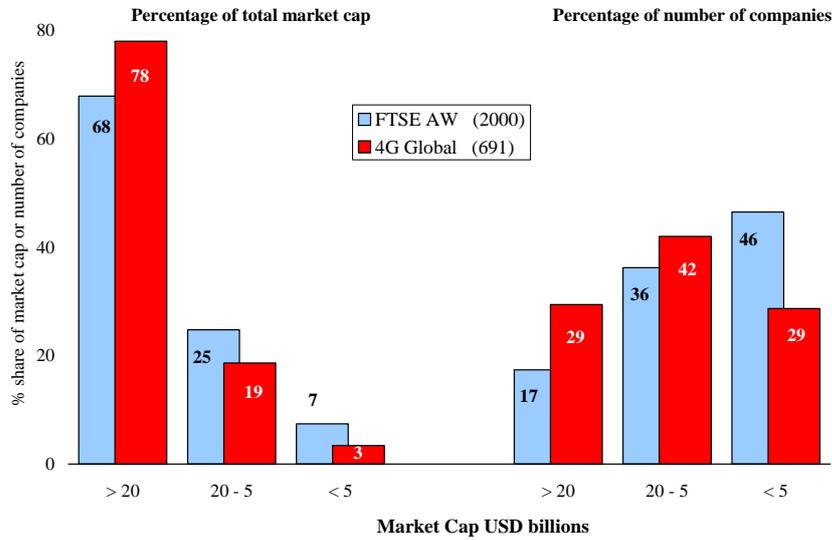


Chart 7 Industry composition of F4G Global versus FTSE Global yearend 2007

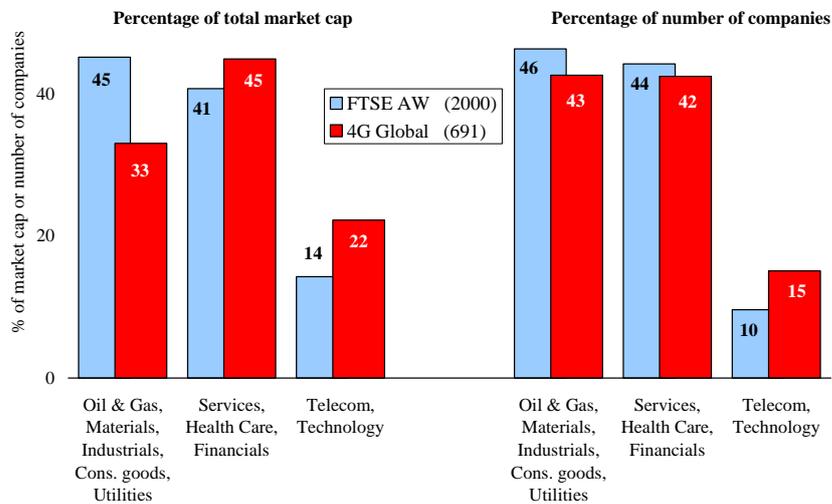


Table 4 shows that the global FTSE4G index outperformed its FTSE AW Developed Global benchmark over the entire period 1997 – 2007. This despite the fact that the

regional indices for the US and Europe, which together account for approximately 85% of the global index, both underperformed relative to their respective benchmarks over the whole period. Chart 8 below shows that the differential in the growth trajectories between the global index and the two regional indices, arose during the dot-com period, 1997-2000. This differential may have been caused by a biased regional composition of the F4G index relative to its FTSE Global benchmark index, e.g. if the F4G was tilted in favour of US companies, which experienced the strongest growth in value over the period, or if tilted in favour of the other regions/countries than the US and Europe, i.e. Asia, Australia and Canada, resulting in especially large gains over the dot-com period. We do not have figures that can confirm/disprove these two potential explanations, but Chart 9 indicates that the first explanation, i.e. US tilting, may not be correct. The chart shows that the F4G Global, as per yearend 2007, was strongly biased in favour of European, as opposed to US, companies. An alternative, third, explanation for the differential between the F4G may have to do with the different regionally, industry-, and size-related tilts in favour of the US, Europe or the other regions/countries in the global FTSE index, cf. Chart 10. This illustrates how SRI selection may lead to relatively major, and not readily discernible, changes in portfolio returns and risks.

Chart 8 Cumulative excess returns, regional FT4G indices

Jan 99 – Dec 07

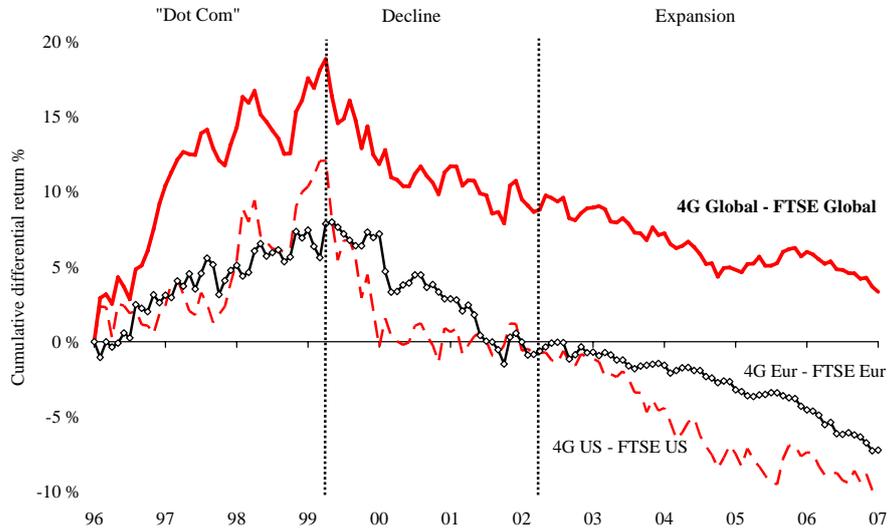


Chart 9 Regional composition of F4G versus FTSE global indices yearend 2007

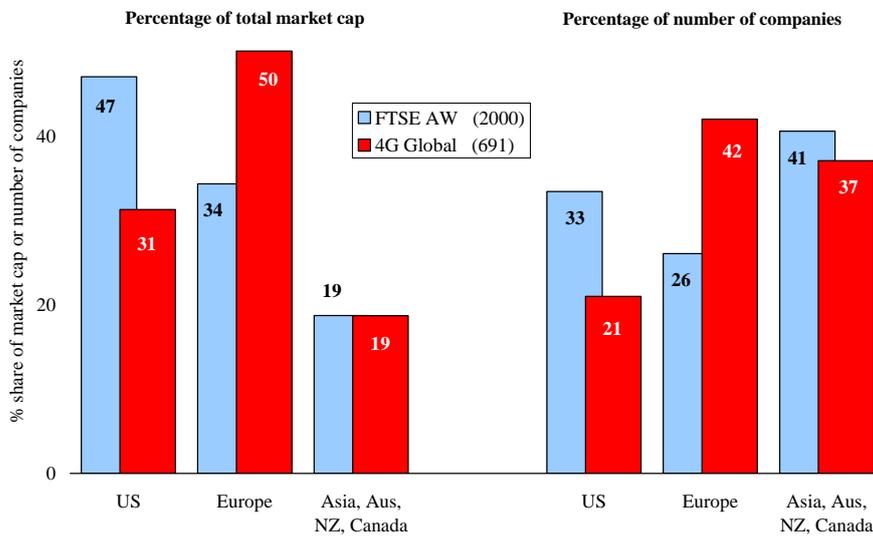


Chart 10 Regional, industry- and size-related tilting of F4G Global yearend 2007

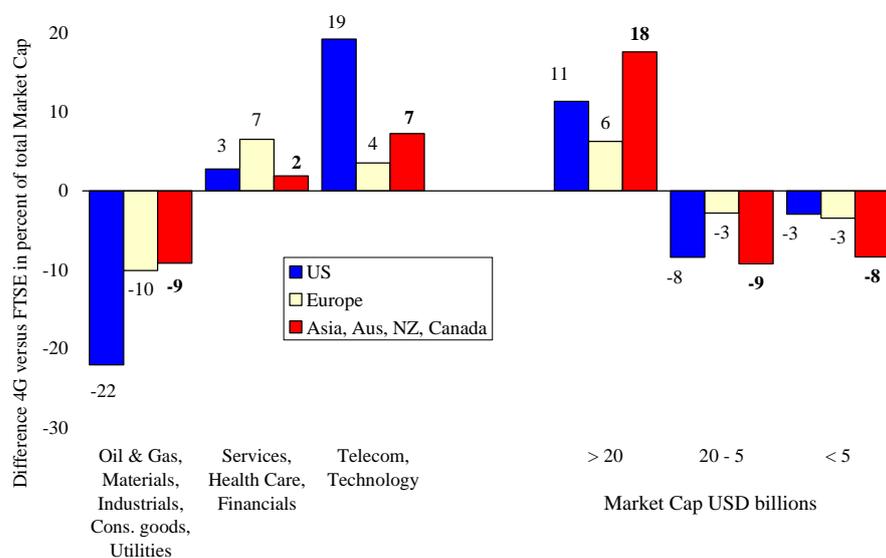


Table 5 shows how the European SRI indices F4G Europe (second column of figures) and STOXX SI (fourth column of figures) have used different ethical selections of Norwegian companies as per yearend 2007. The FT4G combines negative and positive selection, and can be compared to the correspondingly selected STOXX SI exAGTAF index. However, the benchmark index STOXX uses a much smaller SRI selection than does the benchmark index FTSE; only about 25% of the number of companies as compared to about 55% for the FTSE. Only 4 of the 17 Norwegian companies in the STOXX 600 have therefore been found worthy of inclusion in the STOXX SI (and in the exAGTAF index), while 7 of the 11 Norwegian companies in the FTSE Europe have been included in the F4G Europe. The SRI selection overlaps as far as three of the companies are concerned, i.e. StatoilHydro, Telenor and Norsk Hydro (Telenor has been negatively selected from the STOXX exAGTAF index, cf. below).

Table 5 Norwegian companies in European indices: SRI versus benchmark index

% weight by value as per 31 December 2007

Company	FTSE Eur	FT4G	Stoxx 600	Stoxx SI	Stoxx SI ex Agtaf	Stoxx SI ex Agtafa
STATOILHYDRO	0.38 %	0.54 %	0.35 %	0.64 %	0.73 %	0.78 %
TELENOR	0.19 %	0.27 %	0.18 %	0.34 %	0.37 %	
DNB NOR	0.15 %	0.21 %	0.11 %			
NORSK HYDRO	0.13 %	0.18 %	0.09 %	0.16 %	0.17 %	0.19 %
YARA	0.10 %	0.14 %	0.09 %			
AKER KVÆRNER	0.05 %		0.04 %	0.07 %	0.08 %	0.08 %
STOREBRAND	0.05 %	0.06 %	0.03 %			
NORSKE SKOGINDUSTRIE	0.02 %	0.02 %	0.01 %			
ORKLA A	0.20 %		0.12 %			
SEADRILL	0.07 %		0.06 %			
REC	0.05 %		0.04 %			
ACERGY			0.04 %			
MARINE HARVEST			0.01 %			
PETROLEUM GEO-SERVIC			0.04 %			
PROSAFE			0.03 %			
SCHIBSTED			0.02 %			
TANDBERG			0.02 %			
Sum index weight	1.38 %	1.43 %	1.28 %	1.21 %	1.35 %	1.06 %
Number of companies	11	7	17	4	4	3
% of benchmark		64 %		24 %	24 %	18 %
Number of index companies	521	290	600	154	138	132
% of benchmark		56 %		26 %	23 %	22 %

This selection seems to illustrate the SRI indices' tilting towards well-established large-cap companies. On the other hand, it is difficult to understand the diverging ethical assessment of DnB Nor, Yara and Aker Kværner. The same can be said for FTSE's failure to include Orkla and, in particular, the failure to include the successful Norwegian environmental company REC in the F4G. This SRI selection for Norwegian companies illustrates the element of arbitrariness that appears to characterise such positive selection in practise.

4.4 Factor analyses of return and risk for SRI portfolios

The above analysis finds surprisingly poor return performance for both positively and negatively selected SRI portfolios over the last 9-11 years, as measured both by average return and risk relative to the relevant benchmark indices. This conflicts with the findings of *e.g.* Bauer et al. (2005) for the years prior to 2002. We will here attempt to explain our

findings more systematically than suggesting that they are likely to be caused by the systematic bias in the portfolio composition in relation to industry and company size, as noted in the preceding Chapter 4.3. We do so by adhering to a tradition that was established in a key study by Fama and French, which involves adjusting the excess return relative to the benchmark index in relation to three risk factors: Market, value and size. The market factor is in our case defined as the excess return on the benchmark index relative to a risk-free rate of interest, where we consider the benchmark index to be a stand-in for the broader market portfolio. The value factor is defined as the excess return on companies with low prices relative to companies with high prices, as measured by the stock market value of outstanding shares relative to book value. The size factor is correspondingly defined as the excess return on small-cap relative to large-cap companies, as measured by the total stock market value of the companies. Fama and French (F&F) found that both the value and the size factors have tended to correspond to positive excess returns relative to what would be indicated by ordinary risk assessments (market or beta risk).

Without going into any detail as far as methodology is concerned, we can briefly say that an F&F factor analysis of a portfolio implies that we adjust the return in relation to a special weighting of the factors value and size of the companies in the portfolio, and that we also cater for any systematic cyclical bias relative to the benchmark index by including the market factor. The excess return on an SRI portfolio that is tilted in favour of large-cap companies, can be expected to register a negative score as far as the size factor is concerned. If the portfolio is also tilted in favour of companies or industries with a large growth potential, e.g. companies within the telecoms/technology sector, as opposed to traditional manufacturing industry, one can expect the excess return on the portfolio to also register a negative score in respect of the value factor, since such growth companies will normally have prices that are high relative to their book equity. In addition, a tilting in favour of growth companies means that one can also expect the excess return to register a positive score in respect of the market factor, since such companies tend to be characterised by more cyclical risk (higher beta values relative to

the market portfolio)¹². This effect may be curbed as a result of the concurrent tilting of the SRI portfolios in favour of large-cap companies (generally lower cyclical risk; lower beta values).

Table A.3 of the Appendix presents the outcome of the following regression of monthly data on SRI excess returns (relative to benchmark index) against monthly factor contributions:

$$SRI_t - RB_t = \alpha + \beta_1 \cdot Market_t + \beta_2 \cdot Size_t + \beta_3 \cdot Value_t.$$

The regression has been run separately for each of the 6 most important SRI indices in Table 6 (all except DJSI exAGTAF/A), and for each of the three abovementioned sub-periods, i.e. a total of 18 regressions¹³. The meaning of these regression outcomes is explained below in relation to Tables 9-10 and Charts 12-13. But let us first look at some headline figures for average returns, risks and correlations for the three F&F factors in relation to the excess returns on the two US SRI indices.

The two upper parts of Table 6 show these figures for the DS400 and the FT4G US, respectively, for the entire period 1997 – 2007 and for each of the three sub-periods "dot-com" (Jan 97 – Mar 00), "stock market decline" (Apr 00 – Mar 03) and "expansionary phase" (Apr 03 - Dec 07). The bottom part of the table shows correlations between each pair of the three factors for each of the periods, and the relationship over time between the factors is further illustrated in Chart 11.

¹² The regression analysis below uses the excess return on the SRI portfolio relative to the benchmark indices (the market portfolios) as the left-hand variable. The regression coefficient for the market factor will therefore correspond to (beta – 1) in a standard CAPM or F&F regression where the excess return relative to the risk-free rate of interest is used as the left-hand variable.

¹³ There may be reason to believe that the residuals for these regressions are not stochastically independent within each sub-period. It is therefore conceivable that SUR regressions would have improved the efficiency characteristics relative to our simple OLS regressions in Table A.4. We have not checked this.

Table 6 Excess return/risk versus F&F factors for sub-periods

(% annualized; USD)

	jan.97 - des.07			jan.97 - mar.00			apr.00 - mar.03			apr.03 - des.07		
	Avg ¹	Stdev	Corr ²									
DS400 relative to S&P500 and F&F value- and size factors³												
SRI - RB	0.22	2.94	1.00	3.94	2.97	1.00	-1.45	3.63	1.00	-1.27	2.12	1.00
Marked	5.34	14.83	0.22	20.01	17.04	0.35	-19.27	17.36	0.05	10.84	8.58	0.16
Verdi	2.14	15.18	-0.32	-17.23	18.64	-0.38	20.20	18.34	-0.20	3.98	6.67	-0.27
Størrelse	3.39	12.60	0.09	-1.87	16.10	0.00	8.10	14.22	0.20	4.02	7.73	0.20
FTSE4G US relative to FTSE US and F&F value- and size factor³												
SRI - RB	-0.70	3.80	1.00	5.11	4.27	1.00	-3.01	4.51	1.00	-2.38	2.51	1.00
Marked	5.52	14.92	0.40	20.49	17.10	0.42	-19.67	17.52	0.42	11.19	8.52	0.18
Verdi	2.14	15.18	-0.36	-17.23	18.64	-0.45	20.20	18.34	-0.25	3.98	6.67	-0.16
Størrelse	3.39	12.60	0.07	-1.87	16.10	-0.08	8.10	14.22	0.38	4.02	7.73	-0.10

¹ Simple annualization: $Avg_{yr} = Avg_m \times 12$, while tables 2-4 use geometric annualization: $(1 + Avg_{yr}) = (1 + Avg_m)^{12}$.

² Correlation with (SRI - RB) = Excess return SRI-index relative benchmark index (RB).

³ SRI - RB = Excess return for DS400 relative S&P 500 and for F4G US relative FTSE AW US (RB).

Marked = RB - RF = Excess return for S&P 500 and FTSE AW US (RB) relative 1month riskfree rate (RF).

Value = Diff. return value- vs growth stocks (50% of stocks with, respectively lowest and highest market cap relative to book value).

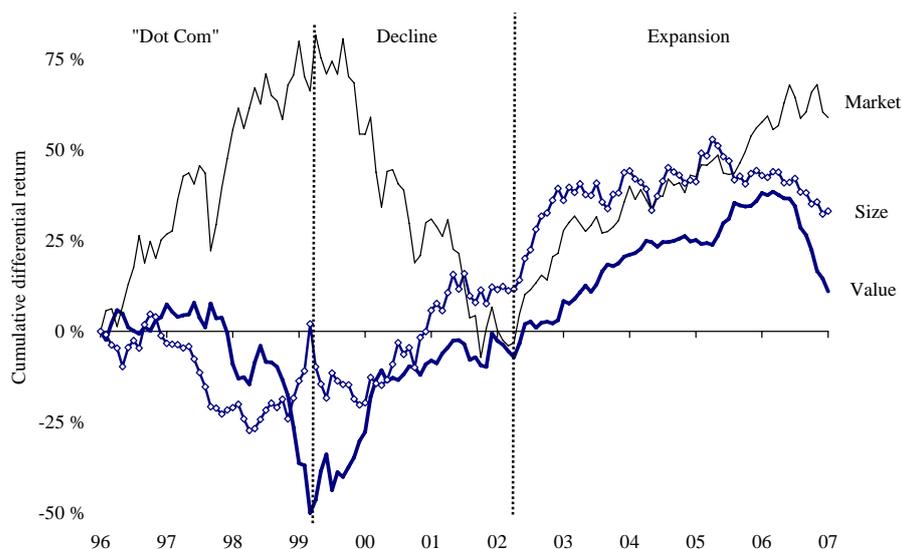
Size = Diff. return for small relative to large companies (1/3 of American comp. with, respectively smallest and largest market cap).

Factor correlations*

	Market*	Value	Market*	Value	Market*	Value	Market*	Value
Value	-0.17		-0.23		-0.05		0.18	
Size	0.09	-0.34	-0.11	-0.61	0.26	-0.22	0.49	0.00

* Market = (FTSE US - RF); not reporting corresponding values for S&P500, which deviates only marginally.

Chart 11 Value developments for Fama & French factors, 1997 – 2007



We note that the value and size factors moved fairly much in parallel over the period 1997 – 2007 (with indications of diverging movements during 2007). Developments for these factors were clearly opposite to those for the market factor during the dot-com and stock market decline periods. Both factors were negative when the market factor was strongly positive (dot-com), and generally positive during the stock market decline (negative market factor). During the expansionary period, Apr 03 - Dec 07, on the other hand, all three factors have moved in parallel (except for the final year as far as the value factor is concerned) and have generated significant positive return contributions, as they have also done for the entire period 1997-2007 as a whole.

As mentioned, SRI portfolios are generally tilted in favour of large-cap growth companies. We would therefore expect, in line with the introductory arguments above, to observe the excess returns on the portfolios being negatively correlated with the value and size factors and positively correlated with the market factor. Two of these characteristics are confirmed in Table 6 for the US SRI indices, cf. how the third column of figures shows negative correlations for the value factor and positive correlations for the market factor, respectively. Correspondingly, negative and positive beta estimates, respectively, are shown in Table A.3 of the Appendix. On the other hand, the findings for the size factor are mixed as far as our tilting hypothesis is concerned. For the FTSE4G, the size correlation is negative during the dot-com and expansionary periods, while it is positive during the period of stock market decline and overall for the entire period 1997-2007. For the DS400, the size correlation is actually positive for all time periods, which is probably caused by the special composition of this index, which is also clearly tilted in favour of many small-cap companies. The findings in Table A.3 from the multi-variable regressions deliver outcomes that are more in line with our hypotheses (also for the DS400), cf. the summary in Table 7 of the number of "correct" positives/negatives.

Table 7 "Correct" coefficient signs in F&F regressions *

Number of significant coefficient estimates in parentheses (10% level)

Period	Market > 0	Value < 0	Size < 0
jan 97 - mar 00	4 (3)	3 (3)	6 (6)
apr 00 - mar 03	5 (1)	4 (1)	3 (3)
apr 03 - dec 07	4 (3)	3 (2)	5 (5)

* 6 regressions/SRI-portfolios per period. Report number of "correct"

signs for the estimated factor coefficients in the regression:

$$SRI_t - RB_t = \alpha + \beta_1 \cdot Market_t + \beta_2 \cdot Value_t + \beta_3 \cdot Size_t + \varepsilon_t.$$

See table A3 in the appendix.

Table 7 F&F factor contributions to SRI excess returns for sub-periods

(% annualized; bold average-numbers are significant at min 10% level)

Period	SRI-index	SRI - RB	Contribution from				Value + Size		
			Alpha	Market	Value	Size			
jan 97 - mar 00	Domini 400	Gj.snitt	3.94	1.70	0.71	1.43	0.10	↑	
		Std.avvik	2.97	2.57	0.61	1.56	0.88		
	F4G US	Gj.snitt	3.99	-0.05	1.06	2.74	0.24	↑	
		Std.avvik	4.27	3.25	0.90	3.00	2.08		
	F4G Europe	Gj.snitt	2.62	-0.08	1.00	-0.15	1.85	↑	
		Std.avvik	3.17	2.75	0.69	1.10	1.12		
	DJSI Stoxx*	Gj.snitt	1.44	3.51	-1.27	-0.87	0.06	↓	
		Std.avvik	3.97	1.74	0.69	2.68	3.55		
	F4G UK	Gj.snitt	0.91	2.03	-1.33	-0.06	0.28	↑	
		Std.avvik	4.67	4.26	1.79	0.39	1.50		
	F4G Global	Gj.snitt	5.63	3.04	0.29	2.08	0.22	↑	
		Std.avvik	3.58	3.03	0.30	2.28	1.89		
	apr 00 - mar 03	Domini 400	Gj.snitt	-1.45	-1.10	-0.01	-0.66	0.33	↓
			Std.avvik	3.63	3.56	0.01	0.61	0.58	
F4G US		Gj.snitt	-3.56	-1.58	-1.74	-0.89	0.65	↓	
		Std.avvik	4.51	3.87	1.57	0.82	1.16		
F4G Europe		Gj.snitt	-2.48	-0.38	-1.12	-0.07	-0.9	↓	
		Std.avvik	2.41	1.80	0.82	0.06	1.38		
DJSI Stoxx		Gj.snitt	0.59	1.65	-0.02	0.27	-1.31	↓	
		Std.avvik	2.59	1.57	0.02	0.12	2.16		
F4G UK		Gj.snitt	-0.77	-1.25	0.80	0.17	-0.5	↓	
		Std.avvik	2.25	1.55	0.65	0.45	1.33		
F4G Global		Gj.snitt	-2.59	-0.74	-1.92	-0.12	0.19	↑	
		Std.avvik	3.28	2.89	1.50	0.11	0.34		
apr 03 - dec 07		Domini 400	Gj.snitt	-1.27	-1.46	0.42	-0.37	0.14	↓
			Std.avvik	2.12	2.00	0.34	0.63	0.27	
	F4G US	Gj.snitt	-2.11	-2.60	1.19	-0.34	-0.36	↓	
		Std.avvik	2.51	2.36	0.91	0.57	0.70		
	F4G Europe	Gj.snitt	-1.47	-1.38	-0.07	0.26	-0.27	↓	
		Std.avvik	1.04	0.99	0.04	0.31	0.28		
	DJSI Stoxx	Gj.snitt	-1.2	-0.78	0.34	0.32	-1.09	↓	
		Std.avvik	1.39	0.92	0.21	0.39	1.14		
	F4G UK	Gj.snitt	-1.96	-1.22	-0.26	0.1	-0.58	↓	
		Std.avvik	1.10	0.93	0.19	0.30	0.60		
	F4G Global	Gj.snitt	-1.07	-1.78	0.98	-0.05	-0.21	↓	
		Std.avvik	1.46	1.40	0.56	0.08	0.42		

* Data for DJSI STOXX only from January 1999.

Regression: $SRI_t - RB_t = \alpha + \beta_1 \cdot Market_t + \beta_2 \cdot Value_t + \beta_3 \cdot Size_t + \varepsilon_t$. See table A3 in the appendix.SRI - RB = Excess return for SRI-index relative benchmark (RB).Market = $RB - RF$ = Excess return for benchmark relative 1 month riskfree rate (RF).Value = F&F HML-factor = Diff. return for value- vs growth stocks

(50% av stocks with, respectively lowest and highest market cap relative to book value).

Size = F&F SMB-factor = Diff. return for small relative to large companies

(1/3 av US listed shares with, respectively lowest and highest market cap).

Contribution: For each factor = β times average and standard deviation of factor return, respectively.Market coefficient $\beta_1 = (\beta - 1)$ in a CAPM-regression with (SRI-RF) as lefthand side variable.

Table 7 shows F&F factor contributions to the excess returns and risks associated with, the SRI portfolios, based on the regression figures in Table A.3 of the Appendix. In brief, these analyses show that the high excess returns on the SRI indices during the dot-com period, 1997 – March 2000, can to a large extent be explained by the portfolio's tilting in favour of large-cap growth companies, i.e. large-cap companies within the new growth industries of telecoms and IT/technology (e.g. Microsoft). Chart 11 showed that the value and size factors developed negatively over this period, which resulted in gains for most of the SRI portfolios as these had, generally speaking, negative exposure to exactly these two factors.

For each sub-period and SRI index, the F&F factor contributions to excess returns and risks can be found in the last three columns of figures in Table 11. The second column of figures presents the factor-adjusted excess returns and risks, the so-called alpha returns and residual risks. The arrows on the very right show whether the aggregate return contribution from the value and size factors was positive (arrow up) or negative (arrow down).

During the dot-com period, the DS400 registered an average excess return of 3.94% p.a. relative to its S&P500 benchmark (the first column of figures; the return is measured somewhat differently from the corresponding figure in Table 2 above). The portfolio had a somewhat higher beta value than a neutral value of 1.0 as against the S&P500 (cf. Table A.3), and therefore realised a market contribution of 0.71%. Negative exposure to the value and size factors generated further return contributions of as much as 1.43% (significant at the 10% level) and 0.10%, respectively. The overall factor contribution from SRI tilting during the dot-com period was therefore no less than 2.24% p.a. Hence, the net factor-adjusted excess return or alpha for the DS400 was 1.70%, which can be interpreted as the actual contribution from active ethical management. The table shows corresponding findings for the F4G indices for the US, Europe and the world, while the F4G UK and the DJSI STOXX have lower net alphas than gross excess returns (due to quite a large negative market contribution). Corresponding analyses reported in Table 7

for the entire period 1997 – 2007, show a net negative contribution from the size and value factors for all the SRI portfolios, with the exception of the FT4G Europe. This is due to a fairly large negative size loss resulting from the SRI tilting in favour of large-cap companies, while the value factor is significantly positive for several of the indices. The net factor contributions for the two other sub-periods have generally been negative, especially from the value and size factors. Charts 12-13 show developments over time in the relationship between gross excess returns and net alphas for the two US SRI indices.

Chart 12 Cumulative alpha for Domini 400 (F&F-adjusted excess return)

$$Alpha = (DS400 - S\&P500) - (\beta_1 \cdot Market + \beta_2 \cdot Size + \beta_3 \cdot Value)$$

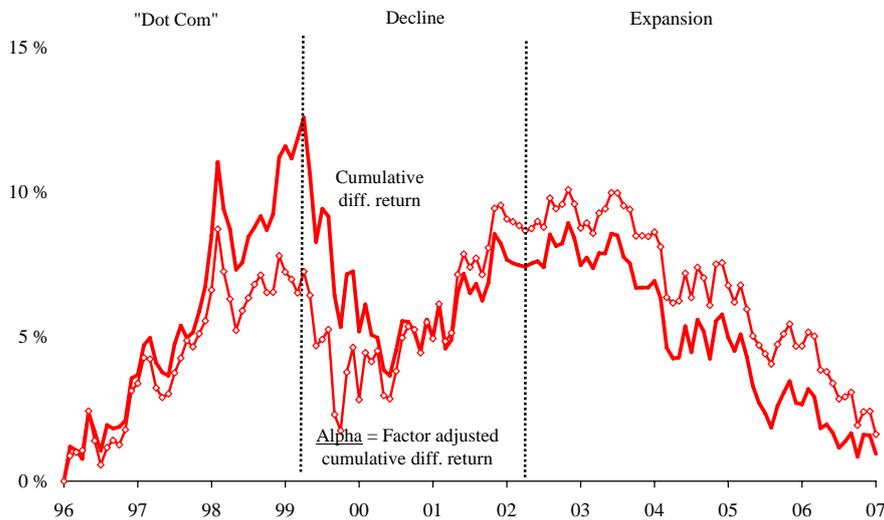
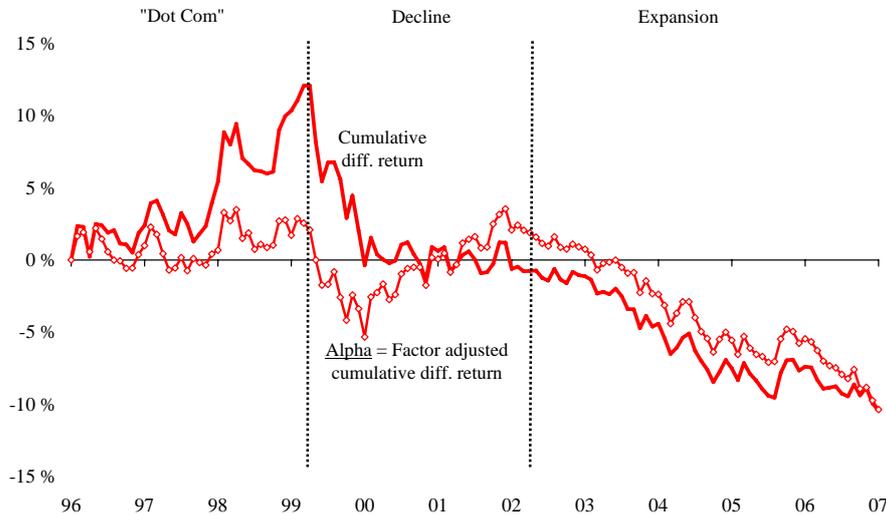


Chart 13 Cumulative alpha for FTSE4G US (F&F-adjusted excess return)

$$\text{Alpha} = (F4G - FTSE) - (\beta_1 \cdot \text{Market} + \beta_2 \cdot \text{Size} + \beta_3 \cdot \text{Value})$$



This factor analysis, together with the analysis in the preceding Chapter 4.3, shows the unintended and considerable risk of return loss as the result of the systematically biased selection associated with positive SRI selection.

4.5 Negative versus positive selection: Effects on selection size, return and risk

The Domini 400 and FTSE4Good indices combine negative with positive selection, as companies involved in the production/sale of alcohol, gambling, tobacco and military weaponry are automatically excluded (AGTAF = Alcohol, Gambling, Tobacco, Armaments and Firearms), and the same applies to companies that own or operate nuclear power plants. The regular DJSI STOXX index, on the other hand, uses only positive selection (best-in-class), but DJ also provides two negatively selected varieties; the DJSI STOXX exAGTAF and the exAGTAFA (AGTAF + Adult entertainment).

The last three columns of Table 9 show the industry-based company effect of the exclusions under the AGTAF and the AGTAFA criteria, respectively, as per 31. December 2007, and Table A.4 of the Appendix lists companies that have been excluded.

Table 9 shows, firstly, that the number of companies is much smaller for all the SRI indices than for the traditional benchmark (132-154 companies versus 600 companies in the STOXX). We note, at the same time, that the negative screening results in certain industries have been accorded a different weighting (the industries below the two dividing lines in the table). We notice the obvious candidates that relate to the production of tobacco, beer, liquor and weapons. More surprising are the exclusions of five of Europe's leading telecoms companies (including Telenor), two leading TV companies (including Sky), two large banks (including Deutsche Bank) and one of Europe's largest hotel chains (Accor).

Table 9 Industry composition for DJ STOXX indices at yearend 2007

Industry	Number of companies			
	DJ STOXX 600	DJSI STOXX	DJSI STOXX ex AGTAF ¹	DJSI STOXX ex AGTAFA ²
Oil & Gas	29	7	7	7
Basic Materials	46	12	12	12
Health Care	29	7	7	7
Utilities	32	11	11	11
Industrials	122	27	24	24
Consumer Goods	68	21	17	17
Technology	24	6	5	5
Consumer Services	86	23	19	17
Telecommunications	20	6	3	1
Financials	144	34	33	31
TOTAL	1 200	308	276	264

¹ AGTAF = Alcohol, Gambling, Tobacco, Armaments, Firearms

² AGTAFA = Alcohol, Gambling, Tobacco, Armaments, Firearms, Adult Entertainment

This illustrates the challenges involved in active SRI management. If the declared asset management strategy is based on positive selection, one becomes vulnerable to criticism from those who may want to identify blameworthy elements in the portfolio, either directly in the included companies or indirectly in the subsidiaries of included companies. This will be the case even with companies that impose high ethical ambitions and requirements on themselves, and that must in the vast majority of their activities be characterised as ethically, morally and environmentally good. It is unlikely, for example, that Telenor and the Accor hotel chain have been excluded from exAGTAFA because

alcohol, gambling, tobacco, weapons or pornography are important activities for these companies. It is more likely that exclusion reflects, for example, that the Accor hotel chain offers so-called adult entertainment on its TV networks.

Tables 9 and A.4 show that the negative selection in the DJSI exAGTAF excludes 16 companies (of 154 companies in the DJSI), with a stock market value that represented approximately 3% of the total stock market value of the regular DJSI index. Table 10 below shows that this nevertheless had fairly major effects on the return characteristics of the portfolio, relative to the DJSI index. More specifically, the exAGTAF index registered both lower average returns and higher risk than the DJSI index during each of the three sub-periods within the selected period; January 1999 – December 2007. This is also illustrated in the subsequent Chart 14.

Table 10 STOXX SI exAGTAF versus STOXX SI, Jan 99 - Dec 07

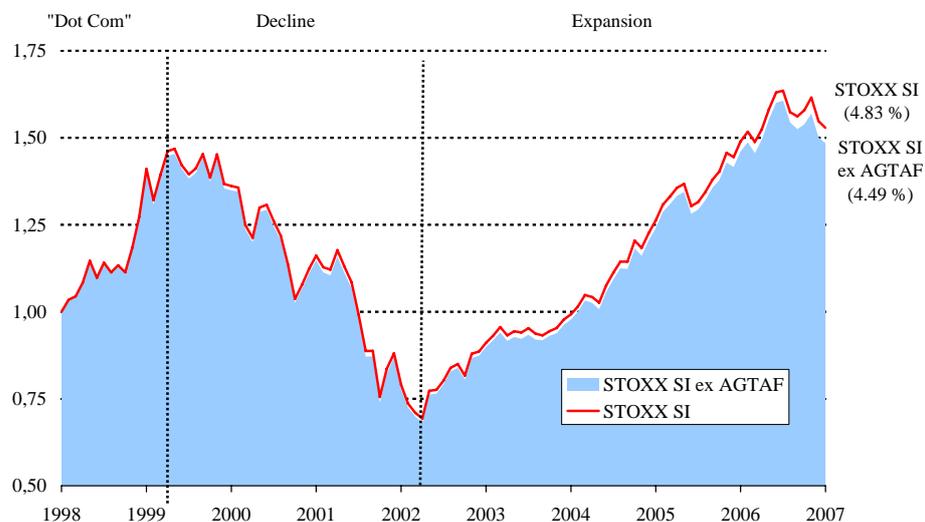
% annualized arithmetic average and standard deviation for monthly (differential) return*

	jan 97 - dec 07		jan 97 - mar 00		apr 00 - mar 03		apr 03 - dec 07	
	Avg	Std dev						
Stoxx SI ex								
AGTAF	5.79	15.69	36.14	15.90	-20.68	19.30	18.34	9.83
Stoxx SI	6.10	15.47	37.09	15.71	-20.52	18.95	18.62	9.65
Meravkastning	-0.31	0.54	-0.95	0.44	-0.16	0.62	-0.28	0.50

* Average return is annualized by $(1+R_m)^{12} - 1$, where R_m is the arithmetic monthly average.

Standard deviation is annualized by $Std_m \times \sqrt{12}$.

Chart 14 STOXX SI ex AGTAF versus STOXX SI, Jan 99 - Dec 07



An assessment of negative selection falls outside our mandate, but the analysis here has nevertheless been included because it illustrates a general problem with negatively or positively selected portfolios, i.e. that the return characteristics of the portfolios may be affected considerably by a limited reduction in the number of companies. The volatility of returns (as measured by the standard deviation) can be expected to increase as the result of reduced diversification. In addition, there is the risk that the portfolio may for long periods of time register a divergent average return as the result of a systematically biased company selection as far as industry, company size or company type are concerned, e.g. the distinction between growth and value companies. Industry biases will occur automatically in negatively selected portfolios, but the potential bias effect is much more pronounced for positively selected portfolios, cf. the discussion in Ch. 4.3 above.

5. Conclusion and recommendation

Our empirical analyses show that SRI funds and indices, during the period since 2003, have registered risk-adjusted returns that are clearly inferior to those of conventional funds. The data show that this has particularly been the case in relation to risk, which has for a number of the SRI funds and indices been considerably higher than has been the case for conventional funds and indices. This is because the screening, and in particular

the more active and extensive positive screening, reduces the selection in such a way that one is left with a strong bias towards e.g. large-cap companies. In other words, the screening also implies that one gets a compositional bias, and thereby higher unsystematic risk.

It is therefore our clear recommendation that the GPFG should keep to the established strategy. This means not changing the principle of negative selection, while further developing the active exercise of ownership rights in the companies in which one has invested. This principle is much more clearly defined than alternative selection principles like positive selection or pioneering investments. The latter two involve a major element of discretionary assessment and entail, as we have shown, a considerable potential for arbitrariness. A consistently positive selection principle will, most likely, increase the risk associated with the Fund and reduce the risk-adjusted return. If the government wants to be a more active investor in, for example, businesses that develop alternative environmental technology or that may contribute to economic growth and development in poor countries, these investments should be made through a separate fund or other institutions, and not under the auspices of the GPFG.

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APPENDIX

Table A.1 SRI indices versus their benchmark indices, Jan 97 – Des 07

% annualized arithmetic average and standard deviation for monthly (differential) return*

Portfolio	jan 97 - dec 07		jan 97 - mar 00		apr 00 - mar 03		apr 03 - dec 07	
	Avg	Std dev						
Domini 400	9.59	15.74	32.93	18.31	-16.03	17.88	13.29	9.10
S&P 500	9.35	14.84	27.91	17.05	-14.79	17.35	14.72	8.51
DS - S&P	0.24	2.94	5.02	2.97	-1.24	3.63	-1.43	2.12
4G US	8.79	16.83	33.62	19.31	-18.15	19.79	12.74	9.25
FTSE US	9.55	14.93	28.51	17.10	-15.14	17.51	15.12	8.44
4G - FTSE	-0.76	3.80	5.11	4.27	-3.01	4.51	-2.38	2.51
4G Europe	10.99	17.09	37.3	19.34	-21.38	19.30	18.77	9.62
FTSE Europe	11.59	16.17	33.84	18.11	-19.37	18.26	20.50	9.55
4G - FT	-0.59	2.32	3.46	3.17	-2.01	2.41	-1.73	1.04
4G UK	7.80	12.96	19.71	13.60	-14.88	15.50	16.26	8.39
All-Share	8.65	13.41	18.64	14.26	-14.21	16.04	18.53	8.63
4G - All Share	-0.85	2.91	1.07	4.67	-0.67	2.25	-2.27	1.10
4G Global	10.26	15.37	29.10	16.70	-18.38	17.87	19.30	9.33
FTSE AW Dev	9.72	14.03	22.16	15.36	-16.20	16.07	20.56	8.89
4G - FTSE	0.54	2.93	6.94	3.58	-2.17	3.28	-1.26	1.46

* Average return is annualized by $(1+R_m)^{12} - 1$, where R_m is the arithmetic monthly average.

Standard deviation is annualized by $Std_m \times \sqrt{12}$.

Table A.2 European SRI indices versus benchmark indices, Jan 99 – Dec 07

% annualized arithmetic average and standard deviation for monthly (differential) return*

Portfolio	jan 97 - dec 07		jan 97 - mar 00		apr 00 - mar 03		apr 03 - dec 07	
	Avg	Std dev						
4G Europe	5.59	15.56	35.22	15.11	-21.38	19.30	18.77	9.62
FTSE Europe	6.94	14.81	32.19	13.78	-19.37	18.26	20.50	9.55
4G - FTSE	-1.35	2.04	3.03	3.24	-2.01	2.41	-1.73	1.04
DJSI	6.10	15.47	37.09	15.71	-20.52	18.95	18.62	9.65
STOXX 600	6.49	14.97	35.18	14.62	-20.67	18.08	20.04	9.57
DJSI - Stoxx	-0.39	2.31	1.91	3.97	0.15	2.47	-1.42	1.39
DJSI ex AGTA	5.79	15.69	36.14	15.90	-20.68	19.30	18.34	9.83
STOXX 600	6.49	14.97	35.18	14.62	-20.67	18.08	20.04	9.57
DJSI - Stoxx	-0.70	2.49	0.96	4.11	-0.01	2.75	-1.70	1.54

* Average return is annualized by $(1+R_m)^{12} - 1$, where R_m is the arithmetic monthly average.

Standard deviation is annualized by $Std_m \times \sqrt{12}$.

Table A.3 SRI excess returns versus F&F factors: regressions for sub-periods

(bold values are significant at min 10% level; t-values in parentheses)

Periode	SRI-indeks	Alfa	Marked	Verdi	Størrelse	R2
jan.97 - mar.00	Domini SE	1.70 (1.05)	0.04 (1.29)	-0.08 (-2.62)	-0.05 (-1.51)	0.27
	F4G US	-0.05 (-0.03)	0.05 (1.50)	-0.16 (-3.97)	-0.13 (-2.82)	0.44
	F4G Europe	-0.08 (-0.05)	0.04 (1.45)	0.10 (2.27)	-0.1 (-2.27)	0.27
	DJSI Stoxx*	3.51 (1.69)	-0.05 (-1.14)	0.18 (4.92)	-0.34 (-5.74)	0.82
	F4G UK	2.03 (0.81)	-0.12 (-2.41)	0.03 (0.54)	-0.13 (-2.01)	0.19
	F4G Global	3.04 (1.61)	0.02 (0.54)	-0.12 (-3.24)	-0.12 (-2.81)	0.30
	apr.00 - mar.03	Domini SE	-1.1 (-0.45)	0.00 (0.02)	-0.03 (-0.94)	0.04 (0.88)
F4G US		-1.58 (-0.59)	0.09 (2.22)	-0.04 (-1.17)	0.08 (1.60)	0.28
F4G Europe		-0.38 (-0.30)	0.04 (2.45)	-0.01 (-0.17)	-0.15 (-4.27)	0.46
DJSI Stoxx		1.65 (1.14)	0.00 (0.07)	0.01 (0.32)	-0.21 (-5.91)	0.65
F4G UK		-1.25 (-1.18)	-0.04 (-2.12)	0.03 (1.41)	-0.12 (-4.41)	0.54
F4G Global		-0.74 (-0.36)	0.09 (2.78)	-0.01 (-0.21)	0.02 (0.62)	0.25
apr.03 - des.07		Domini SE	-1.46 (-1.45)	0.04 (1.06)	-0.09 (-2.25)	0.04 (0.87)
	F4G US	-2.60 (-2.17)	0.11 (2.39)	-0.08 (-1.72)	-0.09 (-1.86)	0.13
	F4G Europe	-1.38 (-2.66)	-0.00 (-0.25)	0.07 (1.91)	-0.05 (-1.93)	0.11
	DJSI Stoxx	-0.78 (-1.62)	0.02 (1.35)	0.09 (2.61)	-0.18 (-8.25)	0.57
	F4G UK	-1.22 (-2.54)	-0.02 (-1.34)	0.05 (2.10)	-0.07 (-4.09)	0.30
	F4G Global	-1.78 (-2.40)	0.06 (2.44)	-0.01 (-0.41)	-0.05 (-1.85)	0.11

* Data for DJSI STOXX only from January 1999.

Regression: $SRI_t - RB_t = \alpha + \beta_1 \cdot Market_t + \beta_2 \cdot Value_t + \beta_3 \cdot Size_t + \varepsilon_t$.SRI - RB = Excess return for SRI-index relative benchmark (RB).Market = RB - RF = Excess return for benchmark relative 1 month riskfree rate (RF).Value = F&F HML-factor = Diff. return for value- vs growth stocks

(50% av stocks with, respectively lowest and highest market cap relative to book value).

Size = F&F SMB-factor = Diff. return for small relative to large companies

(1/3 av US listed shares with, respectively lowest and highest market cap).

Market coefficient $\beta_1 = (\beta - 1)$ in a CAPM-regression with (SRI-RF) as lefthand side variable.

Table A.4 Companies excluded from DJSI ex AGTAF/AGTAFA at yearend 2007

Sorted by Market Cap (EURO billions)

Company	Country	Market Cap	Weight in DJSI (%)	Excluded = X		Industry (subsector)
				AGTAF	AGTAFA	
VODAFONE GRP	UK	121.34	3.85		X	Telecommunications
TELEFONICA	Spania	83.84	2.66	X	X	Telecommunications
BCO BILBAO VIZCAYA						
ARGENT	Spania	49.47	1.57		X	Banks
DEUTSCHE TELEKOM	Tyskland	42.86	1.36	X	X	Telecommunications
DEUTSCHE BANK	Tyskland	36.40	1.16		X	Banks
BRITISH AMERICAN						
TOBACCO	UK	35.46	1.13	X	X	Tobacco
DIAGEO	UK	32.87	1.04	X	X	Distillers & Vintners
HBOS	UK	30.63	0.97	X	X	Banks
CARREFOUR						Food Retailers &
SUPERMARCHE	Frankrike	25.03	0.79		X	Wholesalers
BAE SYSTEMS	UK	21.48	0.68	X	X	Defense
TELECOM ITALIA	Italia	21.06	0.67	X	X	Telecommunications
SABMILLER	UK	12.57	0.40	X	X	Brewers
ROLLS ROYCE GRP	UK	10.96	0.35	X	X	Aerospace
TELENOR	Norge	10.77	0.34		X	Telecommunications
ACCOR	Frankrike	9.73	0.31	X	X	Hotels
HEINEKEN	Nederland	9.51	0.30	X	X	Brewers
BRITISH SKY						
BROADCASTING	UK	7.23	0.23	X	X	Broadcasting
GRUPO ACCIONA	Spania	4.25	0.13	X	X	Heavy Construction
ITV	UK	3.01	0.10	X	X	Broadcasting
LADBROKES	UK	2.26	0.07	X	X	Gambling
TF1	Frankrike	1.94	0.06		X	Broadcasting
INDRA SISTEMAS	Spania	1.70	0.05	X	X	Computer Services
Total - AGTAF		329.4	10.46	16		
- AGTAFA		574.4	18.23		22	