Departamento de Economía Aplicada
Universidad de Oviedo

DPAE/09/07

Discussion Papers on Applied Economics.

Department of Applied Economics. University of Oviedo.

An AHP-based approach to mutual funds social performance measurement

Blanca Pérez-Gladish (bperez@uniovi.es)*

Bouchra M'Zali (mzali.bouchra@uqam.ca) **

* Avenida del Cristo s/n. Facultad de CC. Económicas y Empresariales. Departamento de Economía Cuantitativa. Universidad de Oviedo, 33006, Oviedo. (correspondence author)

** Affiliation: Département de Finance. Université du Québec à Montréal. Case postale 8888, succursale Centre-ville, Montréal (Québec) H3C 3P8, Canada.

Abstract:

Socially responsible investors have both, financial as well as non-financial goals in investment decision-making. But, while several methods for ranking mutual funds based on financial performance have been developed, ranking based on non-financial performance is rather underdeveloped. The aim of this work is to present a ranking method for mutual funds based on their socially responsible performance which could complement financial information and help socially responsible mutual fund managers and individual and institutional investors in their portfolio selection process. For doing so, first, we tried to identify criteria affecting socially responsible mutual funds performance. Second, a hierarchical model in Analytic Hierarchy Process (AHP) framework was developed which takes into account several socially responsible dimensions. Third, a database was developed for each mutual fund with respect to each socially responsible criterion. Fourth, the relative ranking of the mutual funds was then derived through pairwise comparison in all levels and through subsequent synthesizing of the results across the hierarchy using computer software (Expert Choice 11.5). The results reveal, after comparing the rank obtained with the proposed method with rankings derived from other socially responsible measurements, that an integrated framework using AHP and multiple criteria can help the investor in selecting a suitable socially responsible mutual funds portfolio.

Key words: Finance, Socially Responsible Investment, Mutual funds, Decision Support Systems, Analytical Hierarchy Process.

1. Introduction

Socially Responsible Investing (SRI), frequently called Ethical Investments or Sustainable Investments, have grown rapidly around the world in the last decades. SRI is broadly defined as an investment process that integrates social, environmental, and ethical considerations into investment decision making.

Social Responsible mutual funds are one of the main instruments of SRI. The term "fund" is used to refer to a ready-made financial product where investor's money is pooled into a portfolio and a fund/investment manager decides which shares to buy. An ethical/socially responsible fund is a fund where the choice of investments is influenced by one or more social, environmental or other ethical criterion (EIRIS).

There is an increasing body of the literature which examines the field of SRI but most of the research is focused on the financial performance of social responsible funds and few articles can be found related to the socially responsible performance measurement of these funds. The aim of this paper is to propose a ranking method for mutual funds based on their social responsibility which could allow individual and institutional investors to make investment decisions based on their ethical values.

A large number of academic works can be found related to Corporate Social Performance (CSP) measurement based on different companies' social ratings provided by independent agencies throughout the world such as KLD, Ethibel, Vigeo or Innovest. But, from a revision of academic literature and existing practice we find evidence that very few social responsible indicators have been developed for mutual funds' socially responsible performance measurement and that the existing ones, are not optimally using publicly available data. The main conclusion from this revision is the necessity of a suitable social responsible level indicator for mutual funds which take into account the multiple dimensions of social responsibility related not only to the companies behavior but to the fund's one. This is the main contribution of this paper. For a given financial performance we are proposing a mutual funds' ranking method based on the different dimensions of their social responsibility.

The structure of the article is as follows. In the following two sections we will revise current social responsible investment strategies and mutual funds socially responsible performance measures. With this aim, a computer search in the SCOPUS and ABI/Inform Global was conducted to collect the relevant studies related to issues, mutual funds' socially responsible performance measurement and investment strategies, paying special attention to the screening process. We have applied the following search string in order to collect the relevant literature: mutual funds, social performance, investment strategy and screening. From our web search we found a total of 61 scientific papers which with the revision of existing practice have help us in identifying criteria affecting socially responsible mutual funds performance.

Once the relevant criteria have been identified, in section 4 we propose a hierarchical model in Analytic Hierarchy Process (AHP) framework which takes into account several socially responsible dimensions and which will allow us to rank socially responsible mutual funds.

In order to illustrate the AHP-based proposed method we consider five U.S. mutual funds and we construct a database for each fund with respect to each socially responsible

criterion. The relative ranking of the mutual funds is then derived through pairwise comparison in all levels and through subsequent synthesizing of the results across the hierarchy through computer software (Expert Choice Inc. Version 11.5).

The obtained results reveal, after comparing the rank obtained with the proposed method with rankings derived from other socially responsible measurements, that an integrated framework using AHP can provide a useful tool to help the mutual funds managers and individual and institutional investors in selecting a suitable socially responsible mutual funds portfolio. The proposed method is a novel way to give solution to a real unsolved problem, mutual funds' socially responsible measurement and it is intended to convince mutual fund managers and investors about the value to be gained by applying this Multicriteria Decision Making technique to the mutual funds' portfolio selection problem addressed in this paper.

2. Social Responsible Investment Strategies.

The general process of selecting an investment can be described as a series of screens being applied to define an investment universe and finally the investment itself (O'Rourke, 2003). Socially responsible funds works with the same method except that additional screens are also applied in order to select certain companies to be part of mutual fund portfolio on the basis of ethical, environmental and/or social criteria. It is this screening process that defines the level and profile of social responsibility of a fund.

Following O'Rourke (2003), both, the message and the methods of ethical investment are important because they have the potential to influence many stakeholders.

The screens and the methods applied to social responsible or ethical investment are diverse (SIF, 2000):

- *Negative ethical screening:* is the oldest and most basic SRI strategy. These filters refer to the practice that specific stocks or industries are excluded from SRI. The most common negative screens are those related to alcohol, tobacco and gambling, usually known as "sin" stocks. But, as stated by Schlegelmilch (1997), in the last years, as societal issues evolve, investors have developed new exclusionary or negative screens reflecting a wide variety of motivations behind socially responsible investing.
- *Positive ethical screening*: this strategy selects the assets to be included in the financial portfolios of the mutual funds on the basis of social and environmental grounds. The selection is carried out by including in the portfolio some investments in companies that are selected on the ground of their ethically and socially deserving behavior. The best-in class screening uses the same basic approach as the positive screening, but in addition assures that the resulting portfolio is balanced across industries.
- *Community investment*: this category consists in financing special causes and activities that are particularly worthy or underprivileged.
- *Shareholder activism*: this strategy involves the use of the means that are at disposal of the companies' shareholders (for example, the dialogue with

companies and the exercise of the voting right in the shareholders' meetings) in order to improve the companies' ethical behavior.

The Belgium Social Rating independent organization, *Forum Ethibel*, offers a classification into four generations of socially responsible investment funds. Social responsible funds of the *first generation* are built only based on negative criteria. *Second generation* of ethical funds applies positive criteria focused on a specific sector or theme. Researchers for this type of funds actively look for companies performing well in a specific field, for instance, by implementing a special social policy or by making considerable efforts to produce ecologically responsible products. *Third generation* investment funds can rightly be called "sustainable" in the sense that investigations into these funds comprise all areas of sustainable entrepreneurship. In addition of the third generation, a *fourth generation* has arisen. Just like the third generation funds, these funds are invested in sustainable enterprises in the widest sense of the word. The added value, in this case, is in the quality and the method of evaluation. Vital to fourth generation evaluation is the communication with stakeholders of a company.

In the last years there has been an evolution from first generation to fourth generation of screens. In 2007 in the U.S. social screening represented 69% of the applied investment strategies followed by shareholder advocacy which represented 25% (SIF, 2008). In Europe, the most applied strategies in 2007 were shareholder advocacy (31%), simple exclusion (30%), and a combination of both of them (24%) (EUROSIF, 2008).

Investment strategies are thus, important information for the investors to be taken into account in their investment decision process but, as Michelson et al. (2004) maintain "the inter-related issues of transparency and disclosure are main considerations at the company or firm level but also for the funds themselves".

Socially responsible investors need to carefully examine the mutual funds' prospectus to see if the fund investment strategy and social responsible guidelines meet their needs (Hollingworth, 1998). However, this information might not be provided or, if it is, might be sometimes unreliable (Hoggett and Nahan, 2002). Ethical or socially responsible funds are not always forthcoming about which companies (and why) are included in their portfolios (Tippet, 2001). In this sense, Schlegelmilch (1997) carried out a survey among professional investors to gauge the relative importance of "ethically screened" in the information of preferences. "Availability and accuracy of company information" were given top priority by almost all the respondents.

As stated by Schrader (2006), in order to satisfy information's requirements for socially responsible investors, comprehensive advice about ethical or socially responsible funds should be provided related to the information about their conventional financial characteristics and about their specific ethical or socially responsible characteristics.

In this sense, Schwartz (2003) proposed a code of ethics for socially responsible investment related with information disclosure (i.e. indicate explicit criteria for screening decisions; provide moral justifications for screens; indicate parties/individuals who apply criteria; indicate how often screens are applied; indicate which companies are being invested in (real-time) and, indicate how conflicts between bottom-line considerations versus screens will be resolved). He also proposed a code related to the investment process (i.e. avoid minimum percentages for screens; include indirect infringement of screens where

information available; avoid misleading advertising and, engage in an ethical audit of fund periodically).

Credibility is also an important requirement. Credibility could be improved if the investor is informed about the existence and composition of an external controlling body and if third party information, e.g. opinions of credible experts are taken into account. Information about the ethical competence of the investment company may enhance the credibility of an ethical fund too, is also needed in order to ensure credibility.

Koellner et al. (2005) add some other features related to the transparency and credibility of information: the quality of the research method; the diligence in carrying out research activities (e.g. size and relevant experience of research team, information sources, on-site research, continuous monitoring); the overall accountability/compliance (e.g. independent control committee, existence of quality standards, continuous improvement in research processes, establishment of a procedure of detecting defaults); the dissemination of information (e.g. general reporting, transparency of methods applied, transparency of portfolio structure) and the impact on companies in the investment portfolio (e.g. feedback loop to established companies).

Several independent agencies try to supply transparent and credible information about the social, labor and environmental performance of companies throughout the world. Some examples are KLD, Ethibel, Vigeo, Innovest, Oekom Research, SAM, Jantzi Research, Corporate Monitoring, EthicScan Canada, EIRIS, etc. But there are few rating agencies monitoring mutual funds for social responsibility criteria.

Most of these rating agencies classify funds into the SRI category on the basis of the social, environmental and ethical aims and screening strategies without providing any mutual funds rank. But, is this information enough for investors' decision making? Are these agencies following the above recommendations about transparency and quality of the information provided? Are SRI investors getting what they really want?

In table 1 we have displayed the main information provided by some rating agencies providing information for socially responsible mutual funds. If we pay attention to the contents of advice we can observe that most of the agencies provide financial information about the funds (costs, performance, risk and liquidity) and conventional investment strategy information (type of security, country and industry allocation, financial investment objectives and fund composition).

All the agencies include ethical information related to the ethical investment strategy and about portfolio building but the level of transparency and extend of the explanations differ from one agency to another.

All the agencies indicate explicit criteria for screening decisions. They also provide in their web sites moral justification for screens which can differ from one agency to another in contents and extension. We have not found information about how often the screens are applied and non real-time information about the companies in which the funds are investing in. In none of the cases it is indicated how conflicts between the bottom-line considerations versus screens will be resolved.

Most of the agencies do not detail if there allow indirect infringement of screens and for those offering this information they do not avoid minimum percentages for screen. In

none of the cases information about ethical competence of the investment company is provided (ethical education of the fund manager, co-operation with NGOs).

Table 1. Mutual Funds' rating agencies.

Rating Agency	Description
EIRIS	EIRIS (Ethical Research Investment Services), based in London, is one of the leading providers of non-financial data for the socially responsible investment market in Europe. EIRIS provides services for the managers of retail funds. They publish the EIRIS Green and Ethical Funds Directory which is free directory offering comparable information on each of the UK ethical retail funds currently available. For each fund they describe its ethical investment policy (how is developed and how the fund is adhered to it). They provide information about the existence of an independent ethical committee that has the ultimate say on policy changes and company investments, or if on the other hand, they delegate this responsibility to the fund manager. The directory includes detailed information on each fund's ethical investment strategy, positive and negative screening criteria, existence of a voting policy, engagement approach, available research resources, fund manager contact details and links to further information.EIRIS uses as a transparency proxy if the fund is signatory to the Eurosif Transparency Guidelines.
Ethibel	The Belgium Social Rating independent organization "Forum Ethibel" provides a List of SRI funds operating on the Belgian market, under the Ethibel Label or certification. These funds are included in a funds databank. To indicate the ethical "depth" and the quality of its criteria, ETHIBEL offers a classification in four generations of socially responsible investment funds which takes into account investment strategy.
Vigeo	Vigeo provides the SRI Funds Service, a database of more than 300 funds with Morningstar provider of the financial information. Complete fund reports and an advanced search engine allowing selection of products based on funds social responsibility features: negative and positive criteria, research and committees, transparency and forms of communication and engagement, is provided not for free.
SIF	The Social Investment Forum (SIF) is a national non-profit organization that encourages and promotes the growth of socially responsible investment. Data from this source provide information about the social screening for 67 U.S. socially responsible funds. Potential screening criteria include excluding firms based upon their affiliation with the following 12 industries or issues: alcohol, tobacco, gambling, defense/weapons, animal testing, product/service quality, environment, human rights, labor relations, employment equality, community investment, and community relations. They inform in a table for each criteria is the fund does not invest, if it does positive investment, restricted investment or no screens. SIF describes the proxy voting for each mutual fund (proxy voting records and policies). Shareholders unable to attend a company's annual meeting, vote by proxy on key issues that require shareholder approval such as electing directors for the board, ratifying company auditor's and resolutions that may have been filed. It is required that companies make their proxy voting policies and historical voting records available for the public.
NCI	The Natural Capital Institute (NCI) instigated a project in June 2003, to capture and publish holdings of all SRI mutual funds throughout the world, along with the methods employed by asset managers for company selection. The allocation of investments among publicly held corporations was of particular interest. NCI identified virtually every retail SRI mutual fund in the world with equity holdings, drawing from information that was publicly or privately available, and created a unique searchable database. NCI provide information about portfolio composition, company name and value of shares and SRI screening.

In the case of the Social Investment Forum (SIF) information about the proxy voting records and policies is also provided. EIRIS informs about signature of the EUROSIF transparency guidelines as a signal of transparency. These are voluntary guidelines for

ethical funds which aim to increase accountability to consumers. The guidelines cover 6 key areas including investment criteria, research process and the fund's approach to engagement & voting (see EUROSIF).

All the above agencies apply negative and positive criteria and provide more or less information about research and committees, transparency, forms of communication and engagement and voting policy but they do not publish a mutual fund ranking based on the socially responsibility of mutual funds.

Natural Investments (NI), an independent investment adviser, publishes since 1990 the only rating system, NI Social RatingSM, that monitors the social responsible performance of 30 U.S and Canadian mutual funds. They aim is to give a simple graphic representation based on a qualitative evaluation of each SRI fund's screening process. The authors of the rating looked at the screens stated in the fund's prospectus and verified with the fund managers how they actually applied the screens, either informally or via written policy. Mutual funds were scored and then awarded a ♥ to ♥♥♥♥♥ rating, with ♥ being a fund with minimum screening and ♥♥♥♥♥ given for a fund that was comprehensively screened on many social issues. Recently, NI refined the Rating system and added new credit to funds that participate in Community Investing and Shareholder Activism.

The methodology used to compile the Rating addresses the three main strategies of Corporate SRI – negative and positive screening, and shareholder Activism - along with community investment. The mutual funds are ranked taking into account previous information. Those in the lowest percentile group (0-20%) are awarded ♥, those in the highest percentile group (81-100%) ♥♥♥♥♥. Each fund is reviewed annually to determine its rating.

NI has always maintained that negative screening, while important, should not be valued the same as positive screening. Avoidance of alcohol, tobacco and firearm companies within a fund is relatively easy to apply, but mutual funds that seek and support alternative energy or invest in companies that have progressive employment policies receive special recognition for investing in industry leaders which embrace responsible corporate behaviors. This effort contributes to the changes valued by socially responsible investors, and therefore NI weights Affirmative Screening practices more heavily in its Rating. The use of shareholder dialogue and action is one of the most direct and powerful tools for bringing about changes in corporate behavior and policy with regards to the environment, employment practices and corporate governance. When compiling the NI Social Rating SM they evaluate each fund's participation in dialoguing with companies, drafting and supporting shareholder resolutions (number of times they supported proposals), and divesting as warranted.

Performance in the area of community investment is also included in the Rating. Extra weighting is given to funds that dedicate a portion of its total assets to non-insured targeted investments such as microcredit institutions in emerging markets worldwide. Finally, some mutual funds give a portion of their profits back to the local and world community, perhaps via humanitarian aid, and this is also recognized in the Rating system.

Although numerous measures for Corporate Social Performance have been proposed in the last years, few measures for mutual funds' social performance can be found in the practice and in the scientific literature. Changes in the screening process and methods require new rating approaches and the development of social metrics that could help

individual investors in their investment decision making just as current financial ratings do. In this sense, the rating system published by Natural Investments represents an advance as it takes into account new social responsible investment strategies, such as shareholder activism and community involvement. But more information, specially related to the transparency and credibility of the screening, engagement and voting policy research. From the above revision of literature and rating agencies' procedures we can conclude that necessary information to be taken into account in the proposition of a social responsibility index for mutual funds social performance measurement has to be related not only to the contents but also to the transparency and credibility of these contents.

In the next section we will present a brief survey of the characteristics of some mutual funds' socially responsible performance measures in the academic literature and we will revise if they are capable enough for reflecting all the necessary information to be considered suitable and accurate indicators of mutual funds' social responsibility.

3. Measurement of mutual funds socially responsible performance.

Investors with social responsible goals need to compare and assess the variety of funds based on both, financial as well as non-financial criteria. As stated by Koellner et al. (2005), while approaches to and methods for assessing financial performance exist, the assessment of non-financial performance is rather underdeveloped. Consequently, fund managers are not able to set up standards for non-financial performance (i.e. ecological and social performance), and thus they are unable to account for this aspect to investors and their stakeholders (Koellner et al. 2005).

Because investors have a limited capacity for handling extensive information, there is a growing demand for instruments tailored towards the investors' needs. The social responsibility rating of a fund can provide the desired transparency and should complement the existing financial rating.

Interestingly enough, to date the non-financial rating for mutual funds is less developed than the financial one. As far as the authors of this paper know, although numerous works have been published exploring Corporate Social Performance measures and rating, very few academic studies can be found in the literature concerning to mutual funds' socially responsible performance measurement and non-financial rating.

As it has been mentioned in the introduction a computer search in the SCOPUS and ABI/Inform Global was conducted to collect the relevant studies related to mutual funds' social performance measurement. From our first web search we found a total of 61 scientific papers but only 4 of those works included a specific proposition of a measure for mutual funds' social performance which could assist individual investors in their investment decision making process. In what follows we revise the main characteristics of these indices.

Basso and Funari (2003) proposed a simple binary case for just two ethical categories (ethical/non-ethical funds) and they defined a binary variable *d* as follows

$$d_j = \begin{cases} 0 & if \;\; fund \;\; j \;\; is\; not\; ethical \\ 1 & if \;\; fund \;\; j \;\; is\; ethical \end{cases} \quad (1)$$

If ethical mutual funds are classified into several ethical categories, i.e. three categories[1], ethical level 1 (low), ethical level 2 (average) and ethical level 3 (high), Basso and Funari propose using three binary variables $d^{(1)}, d^{(2)}$ and $d^{(3)}$, on for each category:

Fund category	$d_j^{(1)}$	$d_j^{(2)}$	$d_j^{(3)}$
Non-ethical	0	0	0
Ethical level 1	0	0	1
Ethical level 2	0	1	1
Ethical level 3	1	1	1

As Basso and Funari (2003) states, an indicator that measures ethical level is fundamental, but as they say, in practice is not available. Thus, they based their ethical measurement for mutual funds in available public information about the ethic nature of the funds which is usually available and easy to obtain. This information gives rise to binary variables about the categorical nature of the fund, distinguishing between ethical/non-ethical funds and in the best case, takes into account the categorical nature of the ethical level.

The authors present an empirical application which included 50 randomly generated mutual funds. Their ethical indicator takes integer values in the range 0-3: 0 representing non-ethical funds while strictly positive integer denotes the ethical level of the socially responsible funds. The first 30 funds were non-ethical, whereas the last 20 had an ethical nature: six funds had ethical measure 1, seven had ethical measure 2, and seven had ethical measure 3.

Barnett and Salomon (2006) propose to substitute the classical above described dichotomous approach to categorizing SRI funds (either a fund screens for social responsibility or it does not), by an approach based on screening intensity. This is proposed due to the fact that SRI funds are not homogeneous. Screening intensity is proposed by the authors as a proxy of the extend of diversification of the fund.

The authors employ data from the Social Investment Forum (SIF). They initially considered 67 socially responsible mutual funds and they obtained data about the social screening strategies (number and type of social screens used). The SIF lists 12 types of screens that SRI funds may use to filter firms from their investment portfolios. Potential screening criteria include excluding firms based upon their relation with the following 12 issues: alcohol, tobacco, gambling, defense/weapons, animal testing, product/service

[1] Some agencies and financial advisers split ethical funds into dark, medium and light green categories. *Light green funds*, sometimes called best of sector can include investments in oil, pharmaceuticals and banks, but usually not tobacco, environmental exploitation, armaments, animal testing or companies with poor human rights records. *Medium green funds* apply stricter criteria than light green, but still allow some exposure to oil, banks and pharmaceuticals. *Dark green funds*, on the other hand, apply strict ethical criteria. In addition to the exclusions applied in the light green funds, exposure to oil, pharmaceuticals and banking etc, is severely limited. This means dark green funds with strict ethical screening may limit their performance by excluding whole industry sectors, for example gas and oil companies, from investment.

quality, environment, human rights, labor relations, employment equality, community investment, and community relations. Thus, screening intensity varies from 1 to 12. If a fund's screening intensity is given a value of 12, this indicates that the fund employs all 12 of the above listed screens, whereas a value of 1 indicates that the fund uses only 1 of the 12 available screens. The authors do not distinguish between the different types of screens provided by the SIF: non investment, positive investment, restricted investment or no screens.

Kempf and Osthoff (2008) propose a completely different approach to those described above. They compare the portfolio holdings of SRI mutual funds to conventional mutual funds with respect to their social and environmental standards. For this purpose, they match portfolio holdings information obtained from the Thomson Financial database (CDA) and the CRSP Survivor-Bias Free mutual fund database with ethical stock ratings information obtained from KLD. Based on the ethical ratings of their stock portfolios they rank all funds in their sample and they test whether SRI funds have a higher ethical ranking than conventional funds. The sample consisted of US equity funds which the authors analyzed for the time period from 1991 to 2004.

KLD uses seven qualitative criteria which are needed for positive screening: community, diversity, employee relations, environment, human rights, product, and corporate governance. The authors do not include corporate governance from they study.

For each qualitative criterion KLD provides multiple sub-criteria. The sub-criteria can be divided into strengths and concerns both having a binary score. Each sub-criterion has a zero-one score. The presence of strength or a concern is indicated by one, the absence of strength or concern is indicated by zero. KLD does not aggregate the scores of the sub-criteria to obtain an overall score for the super-ordinate criterion. To get an overall score, the authors transform the concerns into strengths by taking the binary complements. Then they sum up the scores of the sub-criteria and normalize this sum to a range from zero to one. The higher the social responsibility of a company is the higher the rating of the stock. KLD also provides a list of controversial business areas. In a negative screening process, companies belonging to controversial business areas are classified as sin stocks: abortion, adult entertainment, alcohol, contraceptives, firearms, gambling, military, nuclear power, and tobacco.

Funds using a negative screening approach exclude these stocks from their portfolios. The authors used a binary variable to measure whether a stock is a sin stock (rating=0) or not (rating=1) according to an exclusionary criterion. To obtain an overall exclusionary rating (which they called negative rating), they classified a stock as a sin stock if it belongs to any controversial business area. In this case, the stock obtains the rating zero, otherwise the rating one.

To obtain ethical rankings for the funds, they combined the fund holdings information with the stock ratings information. For each mutual fund, the first computed the portfolio weights at the end of each year for those stocks for which rating data is available. Then, they normalized the portfolio weights so that they sum up to one. Using the normalized weights, they calculate the weighted sum of the stock ratings. Based on these aggregated stock ratings they calculated fractional ranks for all funds and normalize them between zero and one. A fund with a higher aggregated portfolio rating obtains a higher ethical rank.

This method seems to be quite interesting but it presents some problems. First, it requires a great research effort which most of the mutual funds' investors would not want to carry out as they are willing to invest in a ready-made financial product where their money is pooled and a fund/investment manager decides which assets to buy. Second, it is a compensatory method, i.e. if two stocks are considered one of them being rated zero (a sin stock) and the other being rated one (non sin stock), the weighted sum will compensate the presence of the sin stock with the presence of the non sin stock in the fund.

Scholtens (2007) in order to assess the CSR performance of SRI funds investigated the screens employed by the funds. They worked with the Dutch SRI equity funds and derived the required information from the annual reports. The information was available for three years (2002-2004).

The authors consider 38 criteria distinguishing between negative (22 criteria) and positive (16 criteria). Among the negative criteria they consider a group of controversial products and services including: weapons of mass destruction, all other weaponry, pornography, alcohol, tobacco/smoking, gambling, nuclear energy, hazardous chemicals, fur, trade in (products of) endangered spices, unsustainable timber. A second group is the one related to controversial production methods or labor conditions: dictatorships/human rights, violation ILO/OECD Codes of Conducts, illegal behavior, child labor, forced labor, discrimination/unequal treatment of employees, corruption, animal testing, GM technologies, intensive farming, unsustainable farming and fisheries. For the positive criteria they distinguish three groups. First, a general group, including: corporate governance, transparency, supply chain responsibility, and code of conduct. Second a group named environmental policies including: management systems and environmental policies, eco-efficiency, supply chain, and transport. Third, a named social policies group, including: management systems, labor conditions, labor circumstances, minorities/anti-discrimination policies, labor unions, human rights policies, community involvement, and supply chain.

The author uses the following symbols for negative criteria:

• exclusion in case of >0% of total sales;

○ exclusion in case of >5% of total sales; and,

◙ exclusion under certain conditions.

For the positive criteria the author uses the symbol ♦ for indicating that the criterion is taken into account.

As for the negative criteria, the fund receives 3 credits for every•, 2 credits for every ○, and 1 credit for every ◙. As for the positive criteria, the fund gets 1 credit for every ♦[2]. The overall score per fund is derived by summing up the credits. It is calculated as a percentage of the maximum score that can be achieved. The author was aware of the fact that this approach results in a rather crude proxy of social performance of funds. But as screens are actually the most important tool for arriving at a socially responsible investment, he relies in this proxy as an indicator of CSR performance on the investment funds.

[2] Note that Scholtens assigns less credits two positive screening than to negative screening which seems to be contrary to the usual practice (see Natural Investment Rating approach, for example)

As where the authors know there is no mutual fund social performance index which takes into account the content dimension and the transparency and credibility dimension. In the next section we will present a ranking method for socially responsible mutual fund which takes into account multiple social responsible criteria related to each dimension, contents and transparency and credibility of the information provided by the mutual fund.

4. An AHP-based method for socially responsible rating of mutual funds.

4.1 Socially Responsible Criteria.

The AHP is a Multi-Criteria Decision Making (MCDM) technique developed by Saaty (1980). This technique is, as stated by Steuer and Na (2003), "extraordinarily elegant in its simplicity, for addressing and analyzing discrete alternative problems with multiple conflictive criteria". The AHP allows subjective as well as objective factors to be considered in a decision-making process allowing the active participation of stakeholders and giving managers a rational basis on which to make decisions (Saaty, 1983).

Several works can be found in the literature relating AHP with finance. Some examples are the works of Arbel and Orgler (1990) describing the application of the AHP methodology to the evaluation of a bank acquisitions strategy; Meziani and Rezvani (1990) developing a four-level AHP model to select a financing instrument for a foreign investment; and Tarimcilar and Khaksari (1991) presenting an AHP model for capital budgeting in the health care industry.

AHP has been successfully applied in last years to multiple criteria decision-making problems in the field of business ethics. Harrington (1997) uses AHP to provide a priority or ranking of the social consensus in the context of computing usage surrounding computer virus (computer programs that replicate and spread themselves automatically) scenarios. AHP pairwise comparison of social consensus was made on subject's responses to questions on different types of computer viruses with different consequences.

Millet (1998) established that ethical dilemmas require evaluation of alternatives usually taking into account conflicting criteria. The complexity of these kinds of decisions may compromise, in the author's opinion, the quality of the ethical decisions and debates. Millet showed how AHP can help improvement of ethical decision making by modeling our values, alternatives, and judgments. Beyond improving the quality of our decisions, the AHP is shown as a useful tool to support the process of examining, justifying, negotiating, and communicating ethical decisions.

Stein and Ahmad (2009) also illustrate how AHP can be applied in the field of ethics. They propose an empirically grounded mathematical model of the magnitude and consequences component of "moral intensity" defined by Jones (1991). The authors illustrate the use of the model in the evaluation of three test cases used in instruments that measure cognitive moral development and they rank-ordered the three cases in terms of magnitude of consequences which is broken into three dimensions: physical, economic, and psychological consequences.

The AHP methodology consists of the following four major steps:

Step 1. Develop of the hierarchy structure:

- Top level: Definition of the overall goal of the decision problem
- Intermediate level: Selection of criteria or factors affecting the decision
- Low level: Alternatives

Step 2. Assign a relative importance of each selection criteria to the goal: once the hierarchy is constructed, the decision-maker begins a priorization procedure to determine the relative importance of elements in each level of hierarchy. The elements in each level are compared as pairs with respect to their importance in making the decision under consideration. A verbal scale is used in AHP that enables the decision-maker to incorporate subjectivity, experience and, knowledge in an intuitive and natural way. After comparison matrices are created, relative weights are derived from the various elements. The relative weights of the elements of each level with respect to an element in the adjacent upper level are computed as the components of the normalized eigenvector associated with the largest eigenvalue of their comparison matrix.

Step 3. Rank alternatives under each criterion: for this either a direct method or a pair wise comparison based method can be used. In both cases, it is necessary to develop a comparative database of alternate mutual funds with respect to each criterion.

Step 4. Rank each alternative's contribution to the goal: Composite weights are determined by aggregating the weights throughout the hierarchy. This is done by following a path from the top of the hierarchy down to each alternative at the lowest level, and multiplying the weights along each segment of the path. The outcome of this aggregation is a normalized eigenvector of the overall weights of the alternatives. The mathematical basis for determining the weights was established by Saaty (1980). Calculation details can be found in the appendix.

The first step in the AHP is to model the problem as a hierarchy. In doing this we explore the aspects of the problem at levels from general to detailed, then we express it in the multileveled way that the AHP requires. As we work to build the hierarchy, we increase our understanding of the problem.

A hierarchy is a system of ranking and organizing ideas where each element of the system, except for the top one, is subordinate to one or more other elements. It allows us to acquire detailed knowledge of complex reality: we structure the reality into its constituent parts, and these in turn into their own constituent parts, proceeding down the hierarchy as many levels as we care to. At each step, we focus on understanding a single component of the whole, temporarily disregarding the other components at this and all other levels. As we go through this process, we increase our global understanding of the complex reality we are studying. Similarly, when we approach a complex decision problem, we can use a hierarchy to integrate the large amounts of information into our understanding of the situation. As we build this information structure, we form a better and better picture of the problem as a whole.

That is the case in this paper. SRI could be broadly defined as a financial management style aimed at optimizing financial performance by applying sustainable or socially responsible development principles in the asset allocation process. When investing in socially responsible mutual funds two different approaches could be followed. The first one

applies a financial screening first and then a social responsible screening. The second one applies first the social responsible screening and then the financial one. In this paper we will not take into account the financial performance as a criterion. We will rank mutual funds based on their social responsibility for a given a financial performance.

Defining socially responsible mutual funds' performance is a really complex tax. Proper socially responsible measurement requires clear information not only about contents but also related to the transparency and credibility of the investment process. From the revision of the literature accomplished in previous sections and the current practice of several independent rating agencies we have tried identify the fundamental criteria contributing to both dimensions of socially responsible performance of mutual funds (contents and transparency and credibility). Criteria corresponding to each of these dimensions are displayed in the following tables.

Figures 1.1 and 1.2, show the hierarchy for the considered decision problem in this work, that is, the determining of a measurement of socially responsible performance for mutual funds, which allow a ranking of those funds.

Figure 1.1 First step on the AHP method: hierarchy structure.

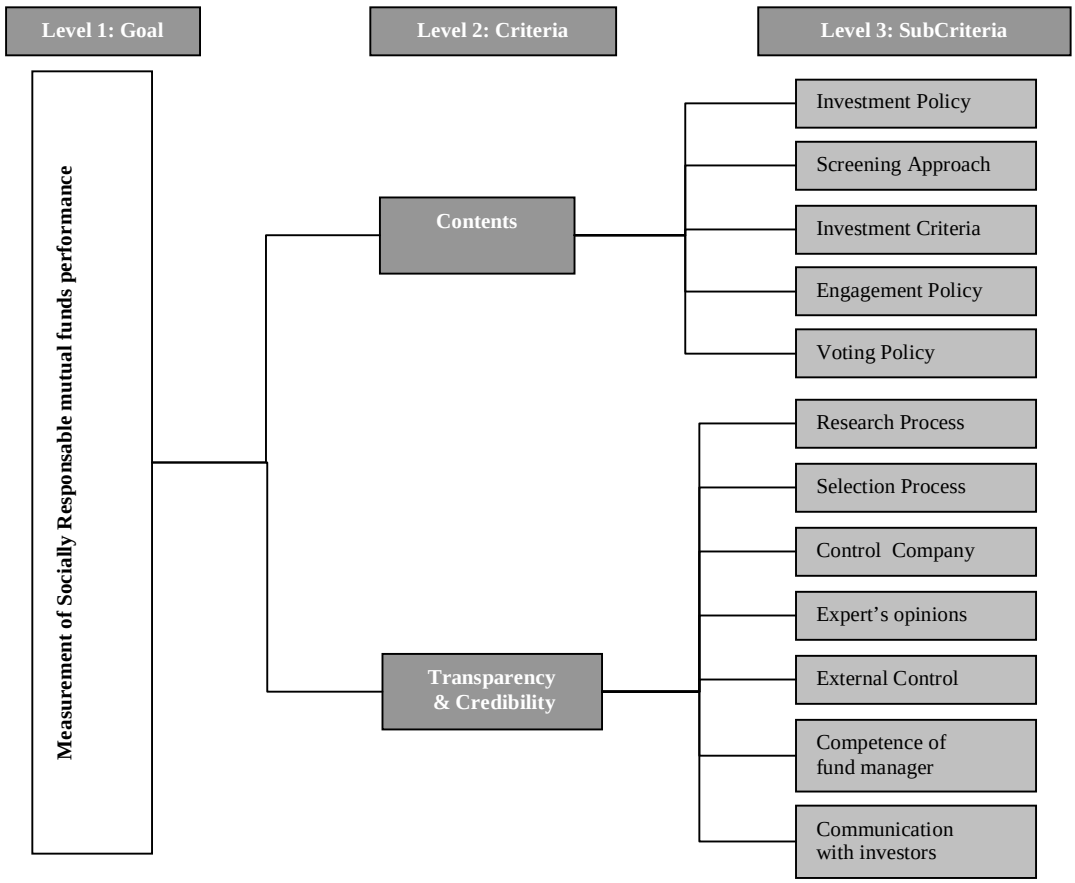

Figure 1.1 First step on the AHP method: hierarchy structure (continuation).

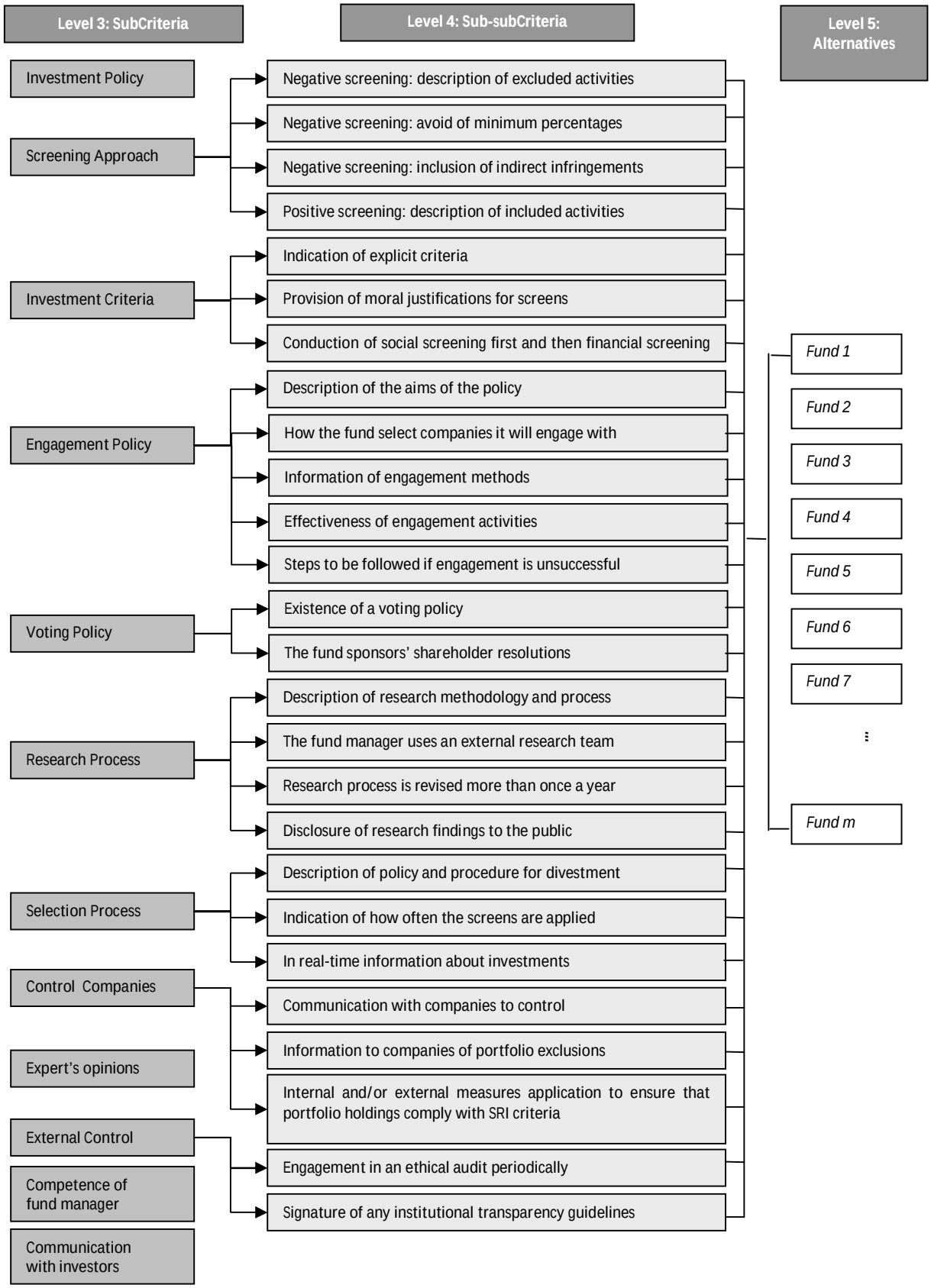

Table 2.1 Criteria to be taken into account in the measurement of mutual funds' social responsible performance.

Criteria	Description	Authors
	Contents	
Investment Policy	Clear description of the investment policy, how is developed and how the fund is adhered to it	O'Rourke (2003), Hollingworth (1998), Basso and Funari (2003), Natural Investment, Hayes (2005), Michelson et al. (2004)
Screening Approach	Type of screen: Positive and/or negative, best-in-industry Avoid of minimum percentages for screens Inclusion of indirect infringement of screens	O'Rourke (2003), Michelson et al. (2004), Schepers and Sethi (2003), SIF (2001), Schlegelmilch (1997), Renneboog (2008), Dillenburg (2003), Barnett and Salomon (2006), Kempf and Osthoff (2008), Scholtens (2007), Natural Investment, De Colle and York (2009), Goodpaster (2003), Hayes (2005), Hogget and Nahan (2002), Kempf and Osthoff (2007), Starr (2008)
Investment Criteria	Indication of explicit criteria for screening decisions Provision of moral justifications for screens	Renneboog (2008), Natural Capital Investment, Goodpaster (2003), Hogget and Nahan (2002), Michelson et al. (2004)
Engagement Policy	Description of the aims of the engagement policy How does the fund prioritize which companies it will engage with? Engagement employed methods How is the effectiveness of engagement activity monitored? What further steps, if any, are taken if engagement is considered unsuccessful? How, and how frequently, are engagement activities communicated to investors and other stakeholders?	Natural Capital Investment, Renneboog (2008), Hutton et al. (1998)
Voting Policy	Does the fund have a voting policy? If so, what is it? Does the fund disclose its voting practices and reasoning for decisions? If so, where can this information be found? Does the fund sponsor/co-sponsor shareholder resolutions?	Natural Capital Investment, Renneboog (2008), Hutton et al. (1998)

Table 2.2 Criteria to be taken into account in the measurement of mutual funds' social responsible performance.

Criteria	Description	Authors
	Transparency and credibility	
Research process	Describe SRI research methodology and process. Does the fund manager use an in-house research team and/or an external research team? Is there an external control or external verification process in place for the research process? Where an Advisory Committee is used, description of responsibilities How frequently is the research process reviewed? What research findings are disclosed to the public? How?	Michelson et al. (2004), Hollingworth (1998), Hogget and Nahan (2002), Tippet (2001), Schlegelmilch (1997), Swartz (2003), Schrader (2006), Koellner et al. (2005), Chatterji et al. (2007), Dillemburg et al. (2003), Dunfee (2003), O'Rourke (2003), Waddock (2003)
Selection process	Indicate how often screens are applied Indicate in real-time which companies are being invested in Indicate how conflicts between bottom-line considerations versus screens will be resolved How are the results of research integrated into the investment process, including selection and approval of companies for investment? What is the policy and procedure for divestments on SRI grounds?	Michelson et al. (2004), Schrader (2006), Koellner et al. (2005), Chatterji et al. (2007), O'Rourke (2003),
Control companies	Description of communication with companies in order to control for the verification of selection criteria Does the fund manager inform companies of portfolio exclusions or divestments due to non-compliance with its SRI policy and criteria? What internal or external measures are in place to ensure portfolio holdings comply with SRI criteria? Do companies have the opportunity to see their profile or analysis? If yes, how often?	Michelson et al. (2004), Schrader (2006), Koellner et al. (2005), Kempf and Osthoff (2008), Chatterji et al. (2007), Goodpaster (2003)
Experts opinions	Some funds have their own internal research team analyzing company activities in order to indentify suitable investments. Other use external research providers such as rating agencies to get that information. In the case of an independent ethical committee it is necessary to know if it has the ultimate say on policy changes and company investments or if it delegates the responsibility to the fund manager. Some funds may have a combined structure where a committee aggress the overall policy, but the actual criteria used and ultimate investment selection is left to the fund manager.	Michelson et al. (2004), Schrader (2006), Koellner et al. (2005), Chatterji et al. (2007), Dillemburg et al. (2003), O'Rourke (2003),
External Control	Engage in an ethical audit of fund periodically Signature of transparency guidelines	Michelson et al. (2004), Schrader (2006), Chatterji et al. (2007), Dillemburg et al. (2003), O'Rourke (2003), Willis (2003)
Competen. of fund manager	Avoid of misleading advertising Provision of information about the ethical education of the fund manager Co-operation with NGOs	Schrader (2006), Koellner et al. (2005), Chatterji et al. (2007)
Communic. with investors	Quality of communication area, communication of activities and social outcomes not only financial ones, undertaken by the fund on behalf of the investor Does the research process include stakeholder consultation? If so provision of details Are investors informed about divestments on SRI grounds? If yes, how frequently and by what means?	Schrader (2006), Koellner et al. (2005), Chatterji et al. (2007), Goodpaster (2003), O'Rourke (2003),

Once the hierarchy has been constructed, AHP is used to establish *priorities* for all its nodes. In this work, we have requested an anonymous SRI expert to establish the priorities. Priorities are numbers associated with the nodes of the hierarchy. They represent the relative weights of the nodes in any group. By definition, the priority of the Goal is 1.000. The priorities of the Criteria will always add up to 1.000. The same follows with the alternatives. The decision-maker has to make his/her judgments about the relative values of the nodes in each level. Table 3 presents the preferences of the scale typically used in the AHP.

Table 3. Pairwise Comparison Scale.

1	*Equal importance*	Two attributes contribute equally to the objective or goal.
3	*Moderate importance of one over another*	Experience and judgment slightly favor one attribute over another.
5	*Essential or strong importance*	Experience and judgment strongly favor one attribute over another.
7	*Very strong or demonstrated importance*	An attribute is favored very strongly over another; its dominance has been demonstrated in practice..
9	*Absolute or extreme importance*	The evidence favoring one attribute over another is of the highest possible order of affirmation.
2,4,6,8	*Intermediate values between adjacent scale values*	When compromised is needed.

Source: Saaty (1980).

Table 4 presents expert's judgments from the pairwise comparisons.

Table 4. Expert's Judgments obtained from pairwise comparison.

Criteria		More Important (A or B)	Intensity (1-9)
A	**B**		
Contents	Transparency and credibility	A	3
Investment policy	Screening approach	B	7
Investment policy	Investment criteria	B	3
Investment policy	Engagement policy	B	9
Investment policy	Voting policy	B	9
Screening approach	Investment criteria	A	5
Screening approach	Engagement policy	B	5
Screening approach	Voting policy	B	5
Investment criteria	Engagement policy	B	7
Investment criteria	Voting policy	B	7
Engagement policy	Voting policy	B	1
Research process	Selection process	A	1
Research process	Control of companies	A	1
Research process	Expert's opinion	A	3
Research process	External control	A	5
Research process	Competence of fund managers	A	3
Research process	Communication with investors	A	7
Selection process	Control of companies	B	5
Selection process	Expert's opinion	B	3
Selection process	External control	A	3
Selection process	Competence of fund managers	A	3
Selection process	Communication with investors	A	3
Control of companies	Expert's opinion	A	3
Control of companies	External control	A	3
Control of companies	Competence of fund managers	A	3
Control of companies	Communication with investors	A	3

Expert's opinion	External control	A	3
Expert's opinion	Competence of fund managers	A	3
Expert's opinion	Communication with investors	A	3
External control	Competence of fund managers	B	1
External control	Communication with investors	A	3
Competence of fund managers	Communication with investors	A	3

Tables 5.1, 5.2 and 5.3 present the preferences of the expert in a matrix format. For example, comparing the importance of contents with transparency and credibility the expert assigned a preference of 3, indicating that Contents criteria has weakly more important than Transparency and Credibility.

Next step in the process is to calculate the consistency of the pairwise comparisons by using a technique suggested by Saaty (1977,1980,1982). Enforcing consistency is an important contribution of the AHP. By itself, a questionnaire cannot identify inconsistencies. According to Saaty (1994a), "The AHP can show one by one, in sequential order, which judgments are the most inconsistent, and also suggests the value that best improves consistency". By providing the expert an opportunity to reexamine preferences in a guided format, the AHP enables a better understand of the importance of the criteria. Saaty (1980) suggested that a consistency ratio value of 10 per cent or less is considered acceptable. Otherwise, it is recommended that the decision maker revise the weight assignment to resolve inconsistencies in the pairwise comparisons.

The previously described steps can be programming into a spreadsheet package or other mathematically based software applications. However, there exist several commercial software packages that use AHP and provide the user computational accuracy, report generation, and graphic capabilities. In this work we choose to use the commercial package Expert Choice 11.5. This software program provides logical and powerful tools for comparing many alternatives when confronted with several conflicting criteria. Expert Choice, as a multicriteria decision support software tool based on AHP allows incorporating in the model both, qualitative and quantitative information based on the experience and intuition of the decision maker and on hard data too. By incorporating both subjective judgments and objective data into the decision-making process, a more satisfactory solution can be realized (Expert Choice, 1995).

Following tables display pairwise relative importance and consistency indices calculated with the software Expert Choice based on the expert's judgments (mathematical details for the calculations can be found in the appendix).

Table 5.1 Analysis of Pairwise Relative Importance of Objectives from Sample Questionnaire.

	Comparison Content Subcriteria	
Preferred Criteria	Contents	Transparency and Credibility
Contents	1	3
Transparency and Credibility	1/3	1
Relative importance of Social Responsible Content Subcriteria		
Weight	0.750	0.250
Consistency Ratio	0.000	

Table 5.2 Analysis of Pairwise Relative Importance of Objectives from Sample Questionnaire.

	Comparison Content Subcriteria				
Preferred Criteria	Investment Policy	Screening Approach	Investment Criteria	Engagement Policy	Voting Policy
Investment Policy	1	1/7	1/3	1/9	1/9
Screening Approach	7	1	5	1/5	1/5
Investment Criteria	3	1/5	1	1/7	1/7
Engagement Policy	9	5	7	1	1
Voting Policy	9	5	7	1	1
Relative importance of Social Responsible Content Subcriteria					
Weight	0.028	0.140	0.051	0.390	0.390
Consistency Ratio	0.08				

Table 5.3 Analysis of Pairwise Relative Importance of Objectives from Sample Questionnaire.

	Comparison Transparency and Credibility Subcriteria						
Preferred Criteria	Research Process	Selection Process	Control of companies	Expert's Opinion	External Control	Competency Fund Man.	Commu. Investors
Research Process	1	1	1	3	5	3	7
Selection Process	1	1	1/5	1/3	3	3	3
Control of companies	1	7	1	3	3	3	3
Expert's Opinions	1/7	3	1/3	1	3	3	3
External Control	1/5	1/3	1/3	1/3	1	1	3
Competency Fund Man.	1/3	1/3	1/3	1/3	3	1	3
Commu. Investors	1/7	1/3	1/3	1/3	1/3	1/3	1
Relative importance of Social Responsible Transparency and Credibility Subcriteria							
Weight	0.260	0.115	0.279	0.161	0.075	0.070	0.040
Consistency Ratio	0.09						

Process explained before is followed for obtaining the relative strengths of criteria in the fourth level with respect to criteria in the third level:

Table 5.4. Subcriteria Relative Strengths in each criterion.

Criteria	Subcriteria	Weights
Screening Approach (SA) (Weight 1.000)	Negative screening: description of excluded activities	0.084
	Negative screening: avoid of minimum percentages for screens	0.033
	Negative screening: inclusion of indirect infringement	0.008
	Positive screening	0.875
Investment Criteria (IC) (Weight 1.000)	Indication of explicit criteria	0.188
	Provision of moral justifications for screens	0.731
	Conduction of social screening first and then financial screening or *viceversa*	0.081
Engagement Policy (EP) (Weight 1.000)	Description of the aims of the policy	0.111
	Information about how the fund gives priority to which companies it will engage with	0.071
	Information of engagement methods	0.362
	Information of how effectiveness of engagement activities is monitored	0.198

	Information about what steps will be follow if engagement is unsuccessful	0.259
Voting Policy (VP) (Weight 1.000)	The fund has a voting policy which practices and reasoning for decisions are displayed	0.750
	The fund sponsors' shareholder resolutions	0.250
Research Process (RP) (Weight 1.000)	Description of research methodology and process	0.114
	The fund manager uses a external research team	0.582
	Research process is revised more than once a year	0.205
	Disclosure of research findings to the public	0.099
Selection Process (SP) (Weight 1.000)	Description of policy and procedure for divestment on SRI ground	0.109
	Indication of how often the screens are applied	0.309
	In real-time information about what companies the fund invests in.	0.582
Control of companies (CC) (Weight 1.000)	Communication with companies to control for verification of selection criteria.	0.634
	Information to companies of portfolio exclusions or divestments due to non-compliance with its SRI policy and criteria	0.174
	Internal and/or external measures application and display in place to ensure portfolio holdings comply with SRI criteria.	0.192
External Control (EC) (Weight 1.000)	Engagement in an ethical audit periodically	0.750
	Signature of any institutional transparency guidelines (i.e. Eurosif guidelines)	0.250

After the consistency of the pairwise comparison matrix has been verified, the next step is to estimate the relative-importance weight of each criterion. Tables 5.1, 5.2, 5.3 and 5.4 show the relative-importance weights also calculated with Expert Choice. The most important criterion for the expert is that related to the Contents which is three times more important than Transparency and Credibility. If we explore the importance given by the expert to subcriteria related to the Contents we can observe how Engagement Policy and Voting Policy have the same weight representing the highest importance with a weight three times the one assigned to the Screening Approach. If we consider subcriteria related to Transparency and Credibility, the more important criteria in the expert's opinion are the Control of Companies and the way the research is carried out, the Research Process. These two criteria have more than double weight than the expert's opinion or the selection process.

The next step illustrates how to determine AHP could help the expert to rank mutual funds according to the previously considered multiple criteria.

4.2 Ranking Mutual Funds based on Socially Responsible Criteria.

The decision alternatives in this model are the mutual funds we aim to rank based on the different socially responsible criteria. In order to illustrate the proposed method we have chosen five U.S. domiciled equity mid-small cap socially responsible mutual funds (see table 6).

Table 6. Equity Mid-Small Cap Mutual Funds investment information (07-04-2009).

Fund's Name	**Principal Investment Sectors**		
	Information	**Service**	**Manufacturing**
AHA Socially Responsible Equity I	12.69 %	42.00 %	45.31 %
Ariel Fund	0%	58.92 %	34.48 %
Calvert Small Cap Value Fund	0%	51.46 %	43.30 %
MMA Praxis Small Cap Fund	19.07 %	55.85 %	25.09 %
Pax World Growth	32.47 %	43.00 %	24.54 %

A comparative qualitative database has been developed for the five mutual funds with the consideration of the identified criteria for socially responsible performance measurement. Tables 1A-5A in the appendix show similarities and differences between mutual funds in relation to the selection criteria and their ideal characteristics.

The suitability of the mutual funds under each socially responsible criterion is estimated by the expert by using empirical data provided by the Social Investment Forum (SIF) and Morningstar Ltd.

In order to calculate each mutual fund's relative strength in serving the socially responsible criteria, first it is necessary to define the way in what each mutual fund characteristic is going to be measured. The measurement is based on set of discrete (binary) and continuous variables (see tables 1A-5A in the appendix). Binary variables are used for one-dimensional criterion. Zero indicates no satisfaction of the characteristic or dimension of the criterion and 1 indicates total satisfaction of the characteristic or dimension of the criterion. Continuous variables have been used for those criteria presenting more than one dimension we have used continuous variables which take values between zero and one depending on the verified characteristics of the fund. Zero indicates no satisfaction of the characteristic or dimension of the criterion; 1 indicates total satisfaction of the characteristics or dimensions of this criterion and intermediate values indicate intermediate levels of satisfaction of these criteria.

In this work we have decided to assign each variable a value corresponding with the weight of the dimension with respect to the criteria (see table 5.4) but, as said before, continuous values from zero to one could be assigned depending on the degree of satisfaction of the characteristic.

Tables 1A-5A in the appendix display the criteria, their dimensions and the weights obtained from the expert's pairwise comparison using Expert Choice 11.5 software.

Following table shows the contribution of each characteristic to the criterion. As it can be observed, if we consider as a criterion the Screening Approach, seven aspects have to be evaluated: the type of screening (negative, positive or both) and for those strategies based including negative screening we will consider if the fund only provides a description of sectors and activities excluded from investment, if it avoid the use of minimum percentages for the screens and finally, if the fund includes indirect infringement of screens.

Once the contributions or weights are obtained from information provided by the expert, the quantitative measurement of the criterion is obtained by aggregating the weights of each characteristic on that criterion (see tables 1A-5A in the appendix). Variables' values for each mutual fund are displayed in the appendix (tables 1A-5A) and summarized in the first panel of table 8.

In order to normalize the table we divide each element in a column by its column sum. The relative strength weights of the mutual funds in serving each criterion are presented on table 8. For example, under the criteria Screening Approach (SA), Ariel fund has the lowest weight, indicating that this fund is the less suitable investment for this particular criterion. But if we consider Investment Criteria the highest weight corresponds to MMA Praxis Small Cap Value Fund followed by Ariel Fund.

Table 8. Measurement of Mutual Funds Characteristics.

	Variables											
Mutual Funds	**IP**	**SA**	**IC**	**EP**	**VP**	**RP**	**SP**	**CC**	**EO**	**EC**	**CFM**	**CI**
AHA Socially Responsible Equity I	0	0.992	0.269	0	0	1	0.582	0.582	0	0	0	1
Ariel Fund	1	0.117	0.919	0	0	1	0.696	0.691	0	0	1	1
Calvert Small Cap Value Fund	0	0.992	0	0	0	1	0	0.582	0	0	0	1
MMA Praxis Small Cap Fund A	0	0.992	1	1	0.111	1	0.696	0.691	1	1	1	1
Pax World Growth	1	0.992	0	0	0	1	0	0.582	0	0	0	1
	Normalized weights											
Mutual Funds	**IP'**	**SA'**	**NIC'**	**EP'**	**VP'**	**RP'**	**SP'**	**CC'**	**EO'**	**EC'**	**CFM'**	**CI'**
AHA Socially Responsible Equity I	0	0.243	0.123	0	0	0.2	0.295	0.186	0	0	0	0.2
Ariel Fund	0.500	0.029	0.420	0	0	0.2	0.353	0.221	0	0	0.5	0.2
Calvert Small Cap Value Fund	0	0.243	0	0	0	0.2	0	0.186	0	0	0	0.2
MMA Praxis Small Cap Fund A	0	0.243	0.457	1	1	0.2	0.353	0.221	1	1	0.5	0.2
Pax World Growth	0.5	0.243	0.000	0	0	0.2	0	0.186	0	0	0	0.2

Source: SIF, Morningstar, Mutual Funds' Prospectus.

Once the relative importance of socially responsible criteria and strength of each mutual fund's contribution to each criterion have been determined, they are combined to obtain the mutual fund's weights.

The following table displays the mutual funds weights with respect to the main criteria: Contents and Transparency and Credibility.

Table 9. Mutual Funds Weights with respect to the criteria.

Fund	Contents	Transparency
AHA Socially Responsible Equity I	0.040	0.146
Ariel Fund	0.040	0.197
Calvert Small Cap Value Fund	0.034	0.112
MMA Praxis Small Cap Fund	**0.838**	**0.433**
Pax World Growth	0.048	0.112

As we can observe, the fund with the highest weight with respect to the socially responsible Contents is MMA Praxis Small Cap Fund which is also the fund with the highest weight with respect to the Transparency and Credibility. But each of these criteria has a different contribution to the goal, i.e. the measurement of mutual funds socially responsible performance. Therefore, next step will consist on the calculation of the mutual funds' weights with respect to the goal, measurement of mutual funds socially responsible performance (SRIP) taking into account the relative contribution of the criteria:

$$SRIP = 0.75\left[0.028IP' + 0.14SA' + 0.051IC' + 0.39EP' + 0.39VP'\right] + 0.25\left[0.26RP' + 0.115SP' + \right.$$
$$\left. + 0.279SC' + 0.161EO' + 0.075EC' + 0.07CFM' + 0.04CI'\right]$$

These weights are calculated with the Expert Choice software:

Table 10. Mutual Funds Weights with respect to the Goal.

Fund	Weight	Ranking
AHA Socially Responsible Equity I	0.067	**3**
Ariel Fund	0.079	**2**
Calvert Small Cap Value Fund	0.053	**5**
MMA Praxis Small Cap Fund	0.737	**1**
Pax World Growth	0.064	**4**
Overall inconsistency	0.08	

The mutual funds rating based on socially responsible criteria and on the SRI expert's opinion has been displayed in table 10. This ranking is not only based on empirical data but also takes into account the relative importance the expert gave to each socially responsible criterion. In table 11 we have compared the obtained results using the AHP-based method with the ranking obtained using other proposed indices in academic literature and practice.

Table 11. Comparison of Mutual Funds Socially Responsible ranking using various indices.

Fund Name	Basso & Funari (2003)	Barnett & Salomon (2006)	Scholtens (2005)	Natural Investment	AHP-based measure
AHA Socially Responsible Equity I	0.2	0.22	0.22	----	0.07
Ariel Fund	0.2	0.05	0.08	0.16	0.08
Calvert Small Cap Value Fund	0.2	0.25	0.24	0.28	0.05
MMA Praxis Small Cap Fund	0.2	0.25	0.26	0.28	0.74
Pax World Growth	0.2	0.23	0.2	0.28	0.06
Total Weight	**1**	**1**	**1**	**1**	**1**

Above table displays the weights for the 5 mutual funds which for each index sum one. As it can observed, if an index of the kind proposed by Basso and Funari (2003) is used, all the funds will result equally ranked with respect to their socially responsibility performance. Results for Barnet & Salomon (2006) and Scholtens (2005) are very similar and in both cases there are very small differences between funds ranked in the first, second, third and fourth position (0.01 points) and there is a great difference between these ones and the last ranked fund, which in both cases is the Ariel Fund.

As it can be observed, four of the five revised methods rank in the first position the same fund but the AHP-based method which incorporates, not only objective but subjective information, into the decision making process, is able to discriminate more between social responsible funds indentifying and weighting more those funds verifying more dimensions of social responsibility. Although, in all the cases the same fund is ranked in the first position, slight differences between this fund and the ones ranked in the second and third position exist when using non AHP-based methods. Therefore, these methods will not assist the individual investor in identifying those funds, in the expert's opinion, really more social responsible.

Natural Capital will rank the same funds for the first, second and third positions with similar weights than Barnett & Salomon and Scholtens and will rank Ariel Fund in the last position.

Finally, the AHP-based method will agree with all previous indices and will rank MMA Praxis Small Cap Fund in the first position, but with an important difference in the weight assigned to this fund (0.74) and a difference of 0.66 points with respect to the second ranked fund.

5. Conclusions and future research and applications of the model.

The scope of this paper was to propose, for a given financial performance, a ranking method for mutual funds based on their socially responsible performance which could allow individual and institutional investors to invest taking into account their ethical values. To do so, an AHP-based method has been proposed which permits us to explore and incorporate into the model the multiple dimensions of mutual funds' social responsibility. The AHP provides a flexible and easily understood way of analyzing complicated models allowing not only objective but subjective factors to be taken into account. The method allows also active participation of all the interested parts in the decision-making process.

As investors with social responsible goals need to compare and assess the variety of funds based on both, financial as well as non-financial criteria, future research would incorporate financial criteria into the model. An interactive method would be proposed including both, the investor preferences and preferences from not only an expert but from the different stakeholders (mutual funds managers, rating agencies, investors…). This will allow the investors to rank mutual funds based on their socially responsibility and financial performance.

Investors have a limited capacity for handling large amounts of information and a rating of a fund taking into account both, financial and non financial aspects can provide a useful tool for investment decision making. As far as the authors of this paper know, to date no mutual fund rating has been proposed taking into account both aspects.

A further step would be the inclusion in the hierarchy of the dimension related to the Corporate Social Responsibility of the companies the fund invests in. This will allow us to build a more comprehensive social responsible rank of mutual funds as we will take into account both, the social responsibility of the mutual fund and the social responsibility of the companies the fund invests in.

In conclusion, we believe that AHP is a highly flexible and powerful method to the area of moral decision making providing, in this work, an excellent tool to measure components of socially responsible performance. This measure may aid in the design and development of a Socially Responsible Decision Support System that help individual investors to select mutual funds through the financial and non financial dimensions of their decisions.

6. Acknowledgements.

We would like to acknowledge professors Barnet and Salomon for their valuable suggestions and comments on earlier versions of this paper. We would also like to acknowledge the Spanish Ministry of Science and Innovation. This paper was written while one of the authors, Blanca Perez-Gladish was in a research visit in UQAM financed by the University Human Resources Mobility Program "Jose Castillejo".

References.

Arbel A, Orgler YE. An application of the AHP to bank strategic planning: The mergers and acquisitions process. European Journal of Operational Research 1990; 48 (1); 27–37.

Barnett M, Salomon R. Beyond Dichotomy: the Curvilinear Relationship between Social Responsibility and Financial Performance. Strategic Management Journal2006; 27; 1101-1122.

Basso A, Funari S. Measuring the Performance of Ethical Mutual Funds: a DEA Approach. Journal of the Operational Research Society 2003; 54; 521-531.

Chatterji AK, Levine DI. Toffel, M.W. How Well Do Social Ratings Actually Measure Corporate Social Responsibility? Journal of Economics & Management Strategy 2007; forthcoming.

De Colle S York JG. Why Wine is not Glue? The Unresolved Problem of Negative Screening in Socially Responsible Investing. Journal of Business Ethics 2009; 85; 83-95.

Dillenburg S, Greene T, Erekson H. Approaching Socially Responsible Investment with a Comprehensive Ratings Scheme: Total Social Impact. Journal of Business Ethics 2003; 43; 167-177.

Dunfee TW. Social Investing: Mainstream or backwater? Journal of Business Ethics 2003; 43; 247-252.

Expert Choice. Version 11.5 Expert Choice. Inc. Pittsburgh, PA; 2009.

Eurosif. European SRI Study Eurosif. Paris; 2008.

Goodpaster KE. Some Challenges of Social Screening. Journal of Business Ethics 2003; 43; 239-246.

Harrington SJ. A Test of a Person –Issue Contingent Model of Ethical Decision Making in Organizations. Journal of Business Ethics 1997; 16; 363-375.

Hayes SK. Socially Responsible Mutual Funds: Issues to Consider When Investing with Your Conscience. Journal of Financial Service Professionals 2005; 59(5); 59-63.

Hoggett J, Nahan M. Ethical Investment -Deconstructing the Myth. IPA Review 2002; 54(3); 3-6.

Hollingworth S. Green Investing: A Growing Concern? Australian CPA 1998; 68(4); 28-30.

Hutton RB, D'Antonio L, Johnsen T. Socially Responsible Investing. Business and Society Review 1998; 37(3); 281-305.

Kempf A, Osthoff P. The Effect of Socially Responsible Investing on Portfolio Performance. European Financial Management 2007; 13(5); 908-922.

Kempf A, Osthoff P. SRI Funds: Nomen est Omen. Journal of Business Finance & Accounting 2008; 35(9); 1276-1294.

Koellner T, Weber O, Fenchel M, Scholz R. Sustainability Rating of Investment Funds. Business Strategy and the Environment 2005; 14; 54-70.

Meziani AS, Rezvani F. Using the analytic hierarchy process to select a financial instrument for a foreign investment. Mathematical and Computer Modelling 1990; 13 (7); 77–82.

Michelson G, Wailes N, van der Laan S, Frost, G. Ethical Investment Processes and Outcomes. Journal of Business Ethics 2004; 52; 1-10.

Millet I. Ethical Decision Making Using the Analytical Hierarchy Process. Journal of Business Ethics 1998; 17; 1197-1204.

O'Rourke A. The Message and Methods of Ethical Investment. Journal of Cleaner Production 2003;11; 683-693.

Renneboog L, Horst JT, Zhang C. Socially Responsible Investments: Institutional Aspects, Performance, and Investor Behavior. Journal of Banking & Finance 2008; 32; 1723-1742.

Saaty TL. The Analytical Hierarchy Process. Mc Graw-Hill: New York; 1980.

Saaty TL. Priority Setting in Complex Problems. IEEE Transaction on Engineering Management 1983; EM-30; 140-155.

Schepers DH, Sethi SP. Do Socially Responsible Funds Actually Deliver What They Promise? Bridging the Gap between the Promise and Performance of Socially Responsible Funds. Business and Society Review 2003; 108(1); 11-32.

Schlegelmilch BB. The Relative Importance of Ethical and Environmental Screening: Implications for the Marketing of Ethical Investment Funds. International Journal of Bank Marketing 1997; 15(2); 48-53.

Scholtens B. Financial and Social Performance of Socially Responsible Investments in the Netherlands. Corporate Governance 2007; 15(6); 1090-1105.

Schrader U. Ignorant Advice -Customer Advisory Service for Ethical Investment Funds Business Strategy and the Environment 2006; 15; 200-214.

Schwartz MS. The "Ethics" of Ethical Investing. Journal of Business Ethics 2003; 43(3); 195-213.

Social Investment Forum. 2000 Report on Socially Responsible Investing Trends in the United States. Available at http://www.socialinvest.org/; 2001.

Social Investment Forum. 2007 Report on Socially Responsible Investing Trends in the United States. Available at http://www.socialinvest.org/; 2008.

Starr M. Socially Responsible Investment and Pro-Social Change. Journal of Economic Issues 2008; 17(1); 51-73.

Stein EW, Ahmad N. Using the Analytical Hierarchy Process (AHP) to Construct a Measure of the Magnitude of Consequences Component of Moral Intensity. Journal of Business Ethics 2009; published online 07 January 2009.

Tarimcilar MM, Khaksari SZ. Capital budgeting in hospital management using the analytic hierarchy process. Socio-Economic Planning Sciences 1991; 25 (1); 27–34.

Tippet J. Performance of Australia's Ethical Funds. Australian Economic Review 2001; 34(2); 170-178.

Waddock S. Myths and Realities of Social Investing. Organization & Environment 2003; 16(3); 369-380.

Willis A. The Role of the Global Reporting Initiative's Sustainability Reporting Guidelines in the Social Screening of Investments. Journal of Business Ethics 2003; 43; 233-237.

Appendix

Computational details for the AHP.

(1) Establish a hierarchical structure.

(2) Compute the element weights of various hierarchies

(a) Establish the comparison matrix A.

Based on an element of the upper hierarchy that is an evaluation standard, a pairwise comparison is conducted for each element. While n elements are assumed, n(n-1)/2 elements of the pairwise comparison must be derived. Let $C_1, C_2, ..., C_n$ denote the set of elements, while a_{ij} represents a judgment on a pair of elements C_i, C_j. An n by n matrix A can be expressed as follows:

$$A = \left[a_{ij} \right] = \begin{bmatrix} 1 & a_{12} & \cdots & a_{1n} \\ 1/a_{12} & 1 & \vdots & a_{2n} \\ \vdots & \vdots & \ddots & \vdots \\ 1/a_{1n} & 1/a_{2n} & \cdots & 1 \end{bmatrix} \tag{1}$$

The results of the comparison of the n elements are inserted into the upper triangle of pairwise comparison matrix A. The lower triangle values are relative position for reciprocal values of the upper triangle. Where $a_{ij} = 1$ and $a_{ji} = 1/a_{ij}$, $i, j = 1, 2, ..., n$, two elements become one quantization value for an important relative judgment. In matrix A, a_{ij} can be expressed as a set of numerical weights, $W_1, W_2, ..., W_n$, in which the recorded judgments must be assigned to the n elements $C_1, C_2, ..., C_n$. If A is a consistency matrix, relations between weights and judgments are simply given by $W_i / W_j = a_{ij}$ and matrix A as follows:

$$A = \begin{bmatrix} w_1/w_1 & w_1/w_2 & \cdots & w_1/w_n \\ w_2/w_1 & w_2/w_2 & \vdots & w_2/w_n \\ \vdots & \vdots & \ddots & \vdots \\ w_n/w_1 & w_n/w_2 & \cdots & w_n/w_n \end{bmatrix} \tag{2}$$

(b) Compute the eigenvalue and eigenvector.

Matrix A multiplies the elements weight vector (*x*) equal to *nx*, i.e., *(A-nI)x = 0*, where x is the eigenvalue (*n*) of eigenvector. Given that a_{ij} denotes the subjective judgment of decision makers, the actual value $\left(W_i / W_j \right)$ has a certain degree of difference. Therefore, $Ax = nx$ cannot be set up. Saaty (1990) suggested that the largest eigenvalue $\lambda_{\max}$ be:

$$\lambda_{\max} = \sum_{j=1}^{n} a_{ij} \frac{W_j}{W_i} \tag{3}$$

If A is a consistency matrix, eigenvector X can be calculated by formula (4):

$$\left(A-\lambda_{\max} I\right) X=0 \tag{4}$$

(c) Perform the consistency test.

Saaty (1990) utilized consistency index (CI) and the consistency ratio (CR) to verify the consistency of the comparison matrix. CI and CR are defined as follows:

$$CI=\left(\lambda_{\max}-n\right)/\left(n-1\right) \tag{5}$$

$$CR=CI/RI \tag{6}$$

where RI represents the average consistency index over numerous random entries of same order reciprocal matrices. If $CR \leq 0.1$, the estimate is accepted; otherwise, a new comparison matrix is solicited until $CR \leq 0.1$.

(3) Compute the entire hierarchical weight.

After various hierarchies and element weights are estimated, the entire hierarchy weight is computed, ultimately enabling decision makers to select the most appropriated strategy (Hsu et al. 2008).

Table A.1 Mutual Funds' evaluation

AHA Socially Responsible Equity I			
Criteria	**Subcriteria**	**Verifies**	**Weights**
Investment Policy	----------	No	0
		Value	**0**
Screening Approach	Negative screening: description of excluded activities	Yes	0.084
	Negative screening: avoid of minimum percentages for screens	Yes	0.033
	Negative screening: inclusion of indirect infringement	No	0
	Positive screening	Yes	0.875
		Value	**0.992**
Investment Criteria	Indication of explicit criteria	Yes	0.188
	Provision of moral justifications for screens	No	0
	Conduction of social screening first and then financial screening	Yes	0.081
		Value	**0.269**
Engagement Policy	Description of the aims of the policy	No	0
	Information about how the fund priorizes which companies it will engage with	No	0
	Information of engagement methods	No	0
	Information of how effectiveness of engagement activities is monitored	No	0
	Information about what steps will be follow if engagement is unsuccessful	No	0
		Value	**0**
Voting Policy	The fund has a voting policy which practices and reasoning for decisions are displayed	Yes	0.750
	The fund sponsors shareholder resolutions	Yes	0.250
		Value	**1**
Research Process	Description of research methodology and process	No	0
	The fund manager uses a external research team	Yes	0.582
	Research process is revised more than once a year	No	0
	Research findings are disclosure to the public	No	0
		Value	**0.582**
Selection Process	Description of policy and procedure for divestment on SRI ground	No	0
	Indication of how often the screens are applied	No	0
	In real-time information about what companies the fund invests in.	Yes	0.582
		Value	**0.582**
Control of companies	Communication with companies to control for verification of selection criteria.	No	0
	Information to companies of portfolio exclusions or divestments due to non-compliance with its SRI policy and criteria	No	0
	Internal and/or external measures application and display in place to ensure portfolio holdings comply with SRI criteria.	No	0
		Value	**0**
Expert's Opinion	----------	Yes	1
		Value	**1**
External Control	Engagement in an ethical audit periodically	No	0
	Signature of any institutional transparency guidelines (i.e. Eurosif guidelines)	No	0
		Value	**0**
Competence of Fund Manager	----------	No	0
		Value	**0**
Communication with investors	----------	Yes	1
		Value	**1**

Source: SIF and Morningstar.

Table A.2 Mutual Funds' evaluation

Ariel Fund			
Criteria	**Subcriteria**	**Verifies**	**Weights**
Investment Policy	----------	Yes	1
		Value	**1**
Screening Approach	Negative screening: description of excluded activities	Yes	0.084
	Negative screening: avoid of minimum percentages for screens	Yes	0.033
	Negative screening: inclusion of indirect infringement	No	0
	Positive screening	No	0
		Value	**0.117**
Investment Criteria	Indication of explicit criteria	Yes	0.188
	Provision of moral justifications for screens	Yes	0.731
	Conduction of social screening first and then financial screening	No	0
		Value	**0.919**
Engagement Policy	Description of the aims of the policy	No	0
	Information about how the fund priorizes which companies it will engage with	No	0
	Information of engagement methods	No	0
	Information of how effectiveness of engagement activities is monitored	No	0
	Information about what steps will be follow if engagement is unsuccessful	No	0
		Value	**0**
Voting Policy	The fund has a voting policy which practices and reasoning for decisions are displayed	Yes	0.750
	The fund sponsors shareholder resolutions	Yes	0.250
		Value	**1**
Research Process	Description of research methodology and process	Yes	0.114
	The fund manager uses a external research team	Yes	0.582
	Research process is revised more than once a year	No	0
	Research findings are disclosure to the public	No	0
		Value	**0.696**
Selection Process	Description of policy and procedure for divestment on SRI ground	Yes	0.109
	Indication of how often the screens are applied	No	0
	In real-time information about what companies the fund invests in.	Yes	0.582
		Value	**0.691**
Control of companies	Communication with companies to control for verification of selection criteria.	No	0
	Information to companies of portfolio exclusions or divestments due to non-compliance with its SRI policy and criteria	No	0
	Internal and/or external measures application and display in place to ensure portfolio holdings comply with SRI criteria.	No	0
		Value	**0**
Expert's Opinion	----------	No	0
		Value	**0**
External Control	Engagement in an ethical audit periodically	No	0
	Signature of any institutional transparency guidelines (i.e. Eurosif guidelines)	Yes	0.250
		Value	**0.250**
Competence of Fund Manager		Yes	1
		Value	**1**
Communication with investors		Yes	1
		Value	**1**

Source: SIF and Morningstar.

Table A.3 Mutual Funds' evaluation

Calvert Small Cap Value Fund			
Criteria	**Subcriteria**	**Verifies**	**Weights**
Investment Policy	----------	No	0
		Value	**0**
Screening Approach	Negative screening: description of excluded activities	Yes	0.084
	Negative screening: avoid of minimum percentages for screens	Yes	0.033
	Negative screening: inclusion of indirect infringement	No	0
	Positive screening	Yes	0.875
		Value	**0.992**
Investment Criteria	Indication of explicit criteria	No	0
	Provision of moral justifications for screens	No	0
	Conduction of social screening first and then financial screening	No	0
		Value	**0**
Engagement Policy	Description of the aims of the policy	No	0
	Information about how the fund priorizes which companies it wil engage with	No	0
	Information of engagement methods	No	0
	Information of how effectiveness of engagement activities is monitored	No	0
	Information about what steps will be follow if engagement is unsuccessful	No	0
		Value	**0**
Voting Policy	The fund has a voting policy which practices and reasoning for decisions are displayed	Yes	0.750
	The fund sponsors shareholder resolutions	Yes	0.250
		Value	**1**
Research Process	Description of research methodology and process	No	0
	The fund manager uses a external research team	No	0
	Research process is revised more than once a year	No	0
	Research findings are disclosure to the public	No	0
		Value	**0**
Selection Process	Description of policy and procedure for divestment on SRI ground	No	0
	Indication of how often the screens are applied	No	0
	In real-time information about what companies the fund invests in.	Yes	0.582
		Value	**0.582**
Control of companies	Communication with companies to control for verification of selection criteria.	No	0
	Information to companies of portfolio exclusions or divestments due to non-compliance with its SRI policy and criteria	No	0
	Internal and/or external measures application and display in place to ensure portfolio holdings comply with SRI criteria.	No	0
		Value	**0**
Expert's Opinion	----------	No	0
		Value	**0**
External Control	Engagement in an ethical audit periodically	No	0
	Signature of any institutional transparency guidelines (i.e. Eurosif guidelines)	No	0
		Value	**0**
Competence of Fund Manager	----------	No	0
		Value	**0**
Communication with investors	----------	Yes	1
		Value	**1**

Source: SIF and Morningstar.

Table A.4 Mutual Funds' evaluation

MMA Praxis Small Cap Fund			
Criteria	**Subcriteria**	**Verifies**	**Weights**
Investment Policy	----------	No	0
		Value	**0**
Screening Approach	Negative screening: description of excluded activities	Yes	0.084
	Negative screening: avoid of minimum percentages for screens	Yes	0.033
	Negative screening: inclusion of indirect infringement	No	0
	Positive screening	Yes	0.875
		Value	**0.992**
Investment Criteria	Indication of explicit criteria	Yes	0.188
	Provision of moral justifications for screens	Yes	0.731
	Conduction of social screening first and then financial screening	Yes	0.081
		Value	**1**
Engagement Policy	Description of the aims of the policy	Yes	0.111
	Information about how the fund priorizes which companies it will engage with	No	0
	Information of engagement methods	No	0
	Information of how effectiveness of engagement activities is monitored	No	0
	Information about what steps will be follow if engagement is unsuccessful	No	0
		Value	**0.111**
Voting Policy	The fund has a voting policy which practices and reasoning for decisions are displayed	Yes	0.750
	The fund sponsors shareholder resolutions	Yes	0.250
		Value	**1**
Research Process	Description of research methodology and process	Yes	0.114
	The fund manager uses a external research team	Yes	0.582
	Research process is revised more than once a year	No	0
	Research findings are disclosure to the public	No	0
		Value	**0.696**
Selection Process	Description of policy and procedure for divestment on SRI ground	Yes	0.109
	Indication of how often the screens are applied	No	0
	In real-time information about what companies the fund invests in.	Yes	0.582
		Value	**0.691**
Control of companies	Communication with companies to control for verification of selection criteria.	Yes	0.634
	Information to companies of portfolio exclusions or divestments due to non-compliance with its SRI policy and criteria	No	0
	Internal and/or external measures application and display in place to ensure portfolio holdings comply with SRI criteria.	No	0
		Value	**0.634**
Expert's Opinion	----------	Yes	1
		Value	**1**
External Control	Engagement in an ethical audit periodically	No	0.750
	Signature of any institutional transparency guidelines (i.e. Eurosif guidelines)	Yes	0.250
		Value	**1**
Competence of Fund Manager		Yes	1
		Value	**1**
Communication with investors		Yes	1
		Value	**1**

Source: SIF and Morningstar.

Table A.5 Mutual Funds' evaluation

MMA Praxis Small Cap Fund			
Criteria	**Subcriteria**	**Verifies**	**Weights**
Investment Policy	----------	Yes	1
		Value	**1**
Screening Approach	Negative screening: description of excluded activities	Yes	0.084
	Negative screening: avoid of minimum percentages for screens	Yes	0.033
	Negative screening: inclusion of indirect infringement	No	0
	Positive screening	Yes	0.875
		Value	**0.992**
Investment Criteria	Indication of explicit criteria	No	0
	Provision of moral justifications for screens	No	0
	Conduction of social screening first and then financial screening	No	0
		Value	**0**
Engagement Policy	Description of the aims of the policy	No	0
	Information about how the fund priorizes which companies it will engage with	No	0
	Information of engagement methods	No	0
	Information of how effectiveness of engagement activities is monitored	No	0
	Information about what steps will be follow if engagement is unsuccessful	No	0
		Value	**0**
Voting Policy	The fund has a voting policy which practices and reasoning for decisions are displayed	Yes	0.750
	The fund sponsors shareholder resolutions	Yes	0.250
		Value	**1**
Research Process	Description of research methodology and process	No	0
	The fund manager uses a external research team	No	0
	Research process is revised more than once a year	No	0
	Research findings are disclosure to the public	No	0
		Value	**0**
Selection Process	Description of policy and procedure for divestment on SRI ground	No	0
	Indication of how often the screens are applied	No	0
	In real-time information about what companies the fund invests in.	Yes	0.582
		Value	**0.582**
Control of companies	Communication with companies to control for verification of selection criteria.	No	0
	Information to companies of portfolio exclusions or divestments due to non-compliance with its SRI policy and criteria	No	0
	Internal and/or external measures application and display in place to ensure portfolio holdings comply with SRI criteria.	No	0
		Value	**0**
Expert's Opinion	----------	No	0
		Value	**0**
External Control	Engagement in an ethical audit periodically	No	0
	Signature of any institutional transparency guidelines (i.e. Eurosif guidelines)	No	0
		Value	**0**
Competence of Fund Manager		No	0
		Value	**0**
Communication with investors		Yes	0
		Value	**1**

Source: SIF and Morningstar.